User Guide

Amazon CodePipeline



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Amazon CodePipeline: User Guide

Table of Contents

What is CodePipeline?	1
Continuous delivery and continuous integration	1
What can I do with CodePipeline?	. 2
A quick look at CodePipeline	2
How do I get started with CodePipeline?	3
Concepts	4
Pipelines	4
Pipeline executions	6
Stage operations	7
Action executions	8
Execution types	8
Action types	8
Artifacts	8
Source revisions	9
Triggers	9
Variables	10
Conditions	10
Rules	11
DevOps pipeline example	11
How pipeline executions work	13
How pipeline executions are started	14
How source revisions are processed in pipeline executions	14
How source overrides work with the EventBridge input transformer	15
How pipeline executions are stopped	16
How executions are processed in SUPERSEDED mode	20
How executions are processed in QUEUED mode	21
How executions are processed in PARALLEL mode	23
Managing Pipeline Flow	23
Input and output artifacts	26
How do stage conditions work?	29
Rules for stage conditions	32
Pipeline types	33
What type of pipeline is right for me?	33
Getting started	39

Step 1: Create an Amazon Web Services account and administrative user	39
Sign up for an Amazon Web Services account	39
Secure IAM users	40
Step 2: Apply a managed policy for administrative access to CodePipeline	40
Step 3: Install the Amazon CLI	42
Step 4: Open the console for CodePipeline	43
Next steps	43
Product and service integrations	44
Integrations with CodePipeline action types	44
Source action integrations	44
Build action integrations	51
Test action integrations	53
Deploy action integrations	56
Approval action integration with Amazon Simple Notification Service	62
Invoke action integrations	63
General integrations with CodePipeline	64
Examples from the community	67
Blog posts	
Tutorials	71
Tutorials Tutorial: Deploy to Amazon EC2 instances with CodePipeline	
	72
Tutorial: Deploy to Amazon EC2 instances with CodePipeline	72 72
Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites	72 72 73
Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites Step 1: Create Amazon EC2 Linux instances	72 72 73 75
Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites Step 1: Create Amazon EC2 Linux instances Step 2: Add artifact bucket permissions to the EC2 instance role	72 72 73 75 76
Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites Step 1: Create Amazon EC2 Linux instances Step 2: Add artifact bucket permissions to the EC2 instance role Step 3: Add a script file to your repository	72 72 73 75 76 76
Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites Step 1: Create Amazon EC2 Linux instances Step 2: Add artifact bucket permissions to the EC2 instance role Step 3: Add a script file to your repository Step 4: Creating your pipeline	72 72 73 75 76 76 81
Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites Step 1: Create Amazon EC2 Linux instances Step 2: Add artifact bucket permissions to the EC2 instance role Step 3: Add a script file to your repository Step 4: Creating your pipeline Step 5: Test Your Pipeline	72 72 73 75 76 76 81 82
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites Step 1: Create Amazon EC2 Linux instances Step 2: Add artifact bucket permissions to the EC2 instance role Step 3: Add a script file to your repository Step 4: Creating your pipeline Step 5: Test Your Pipeline Tutorial: Build and push a Docker image to Amazon ECR with CodePipeline (V2 type) 	72 72 73 75 76 76 81 82 83
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites	72 72 73 75 76 76 81 82 83 83
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline Prerequisites	72 72 73 75 76 76 81 82 83 83 85
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline	72 72 73 75 76 76 81 81 83 83 85 86 91
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline	72 72 73 75 76 76 81 81 83 83 83 85 86 91 92
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline	72 72 73 75 76 76 81 81 83 83 83 85 86 91 92
 Tutorial: Deploy to Amazon EC2 instances with CodePipeline	72 72 73 75 76 76 81 82 83 83 85 86 91 92 92

Step 3: Update the CodePipeline service role policy in IAM	96
Step 4: Create an access entry for the CodePipeline service role	99
Step 5: Create a source repository and add the helm chart config files	
Step 6: Creating your pipeline	100
Tutorial: Create a pipeline that runs commands with compute (V2 type)	102
Prerequisites	103
Step 1: Create source files and push to your GitHub repository	103
Step 2: Create your pipeline	104
Step 3: Run your pipeline and verify build commands	107
Tutorial: Use Git tags to start your pipeline	
Prerequisites	109
Step 1: Open CloudShell and clone your repository	110
Step 2: Create a pipeline to trigger on Git tags	110
Step 3: Tag your commits for release	
Step 4: Release change and view logs	115
Tutorial: Filter on branch names for pull requests to start your pipeline (V2 type)	115
Prerequisites	116
Step 1: Create a pipeline to start on pull request for specified branches	
Step 2: Create and merge a pull request in GitHub.com to start your pipeline executions	119
Tutorial: Use pipeline-level variables	120
Prerequisites	121
Step 1: Create your pipeline and build project	121
Step 2: Release change and view logs	124
Tutorial: Create a simple pipeline (S3 bucket)	125
Create an S3 bucket	126
Create Windows Server Amazon EC2 instances and install the CodeDeploy agent	128
Create an application in CodeDeploy	130
Create your first pipeline	132
Add another stage	135
Disable and enable transitions between stages	142
Clean up resources	143
Tutorial: Create a simple pipeline (CodeCommit repository)	143
Create a CodeCommit repository	144
Download, commit, and push your code	145
Create an Amazon EC2 Linux instance and install the CodeDeploy agent	148
Create an application in CodeDeploy	150

Create your first pipeline	152
Update code in your CodeCommit repository	154
Clean up resources	156
Further reading	157
Tutorial: Create a four-stage pipeline	157
Complete prerequisites	159
Create a pipeline	163
Add more stages	164
Clean up resources	168
Tutorial: Set up a CloudWatch Events rule to receive email notifications for pipeline state	
changes	169
Set up an email notification using Amazon SNS	169
Create a CloudWatch Events notification rule for CodePipeline	171
Clean up resources	172
Tutorial: Build and test an Android app with Amazon Device Farm	172
Configure CodePipeline to use your Device Farm tests	174
Tutorial: Test an iOS app with Amazon Device Farm	178
Configure CodePipeline to use your Device Farm tests (Amazon S3 example)	180
Tutorial: Create a pipeline that deploys to Service Catalog	184
Option 1: Deploy to Service Catalog without a configuration file	186
Option 2: Deploy to Service Catalog using a configuration file	191
Tutorial: Create a pipeline with Amazon CloudFormation	196
Example 1: Create an Amazon CodeCommit pipeline with Amazon CloudFormation	196
Example 2: Create an Amazon S3 pipeline with Amazon CloudFormation	199
Tutorial: Create a pipeline that uses variables from Amazon CloudFormation deployment	
actions	202
Prerequisites: Create an Amazon CloudFormation service role and a CodeCommit	
repository	203
Step 1: Download, edit, and upload the sample Amazon CloudFormation template	204
Step 2: Create your pipeline	205
Step 3: Add an Amazon CloudFormation deployment action to create the change set	207
Step 4: Add a manual approval action	208
Step 5: Add a CloudFormation deployment action to execute the change set	209
Step 6: Add a CloudFormation deployment action to delete the stack	210
Tutorial: Amazon ECS Standard Deployment with CodePipeline	210
Prerequisites	211

Step 1: Add a Build Specification File to Your Source Repository	214
Step 2: Creating Your Continuous Deployment Pipeline	216
Step 3: Add Amazon ECR Permissions to the CodeBuild Role	218
Step 4: Test Your Pipeline	218
Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy	
deployment	219
Prerequisites	221
Step 1: Create image and push to an Amazon ECR repository	221
Step 2: Create task definition and AppSpec source files and push to a CodeCommit	
repository	222
Step 3: Create your Application Load Balancer and target groups	226
Step 4: Create your Amazon ECS cluster and service	229
Step 5: Create your CodeDeploy application and deployment group (ECS compute	
platform)	231
Step 6: Create your pipeline	233
Step 7: Make a change to your pipeline and verify deployment	237
Tutorial: Create a pipeline that deploys an Amazon Alexa skill	237
Prerequisites	237
Step 1: Create an Alexa developer services LWA security profile	238
Step 2: Create Alexa skill source files and push to your CodeCommit repository	238
Step 3: Use ASK CLI commands to create a refresh token	240
Step 4: Create your pipeline	241
Step 5: Make a change to any source file and verify deployment	243
Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider	243
Option 1: Deploy static website files to Amazon S3	245
Option 2: Deploy built archive files to Amazon S3 from an S3 source bucket	249
Tutorial: Publish applications to the Amazon Serverless Application Repository	255
Before you begin	256
Step 1: Create a buildspec.yml file	256
Step 2: Create and configure your pipeline	257
Step 3: Deploy the publish application	259
Step 4: Create the publish action	259
Tutorial: Lambda function deployments with CodePipeline	260
Prerequisites	261
Step 1: Create your sample Lambda function	261
Step 2: Upload the function file to your repository	262

Step 3: Creating your pipeline	262
Step 4: Test Your Pipeline	
Learn more	
Tutorial: Using variables with Lambda invoke actions	
Prerequisites	
Step 1: Create a Lambda function	
Step 2: Add a Lambda invoke action and manual approval action to your pipeline	
Tutorial: Use an Amazon Step Functions invoke action	
Prerequisite: Create or choose a simple pipeline	
Step 1: Create the sample state machine	
Step 2: Add a Step Functions invoke action to your pipeline	
Tutorial: Create a pipeline that uses AppConfig as a deployment provider	
Prerequisites	
Step 1: Create your Amazon AppConfig resources	275
Step 2: Upload files to your S3 source bucket	
Step 3: Create your pipeline	277
Step 4: Make a change to any source file and verify deployment	278
Tutorial: Use full clone with a GitHub pipeline source	278
Prerequisites	280
Step 1: Create a README file	280
Step 2: Create your pipeline and build project	280
Step 3: Update the CodeBuild service role policy to use connections	284
Step 4: View repository commands in build output	284
Tutorial: Use full clone with a CodeCommit pipeline source	284
Prerequisites	285
Step 1: Create a README file	285
Step 2: Create your pipeline and build project	286
Step 3: Update the CodeBuild service role policy to clone the repository	289
Step 4: View repository commands in build output	289
Tutorial: Create a pipeline with Amazon CloudFormation StackSets deployment actions	289
Prerequisites	290
Step 1: Upload the sample Amazon CloudFormation template and parameter file	291
Step 2: Create your pipeline	293
Step 3: View initial deployment	295
Step 4: Add a CloudFormationStackInstances action	296
Step 5: View stack set resources for your deployment	297

Step 6: Make an update to your stack set	297
Create a variable check rule for a pipeline as an entry condition	298
Prerequisites	299
Step 1: Create sample source file and add to your GitHub repository	299
Step 2: Create your pipeline	300
Step 2: Edit the build stage to add the condition and rule	303
Step 3: Run the pipeline and view resolved variables	304
Best practices and use cases	307
Examples of how to use CodePipeline	307
Use CodePipeline with Amazon S3, Amazon CodeCommit, and Amazon CodeDeploy	307
Use CodePipeline with third-party action providers (GitHub and Jenkins)	308
Use CodePipeline to compile, build, and test code with CodeBuild	308
Use CodePipeline with Amazon ECS for continuous delivery of container-based	
applications to the cloud	309
Use CodePipeline with Elastic Beanstalk for continuous delivery of web applications to the	9
cloud	309
Use CodePipeline with Amazon Lambda for continuous delivery of Lambda-based and	
serverless applications	309
Use CodePipeline with Amazon CloudFormation templates for continuous delivery to the	
cloud	309
Use CodePipeline with Amazon VPC	310
Availability	310
Create a VPC endpoint for CodePipeline	311
Troubleshooting your VPC setup	311
Define CI/CD pipelines with stages and actions	313
Create a pipeline, stages, and actions	314
Create a custom pipeline (console)	315
	0.0
Create a pipeline (CLI)	
Create a pipeline (CLI) Create a pipeline from static templates	327
	327 333
Create a pipeline from static templates	327 333 340
Create a pipeline from static templates Edit a pipeline	327 333 340 341
Create a pipeline from static templates Edit a pipeline Edit a pipeline (console)	327 333 340 341 344
Create a pipeline from static templates Edit a pipeline Edit a pipeline (console) Edit a pipeline (Amazon CLI)	327 333 340 341 344 348
Create a pipeline from static templates Edit a pipeline Edit a pipeline (console) Edit a pipeline (Amazon CLI) View pipelines and details	327 333 340 341 344 348 349

View pipeline details and history (CLI)	357
View rule results for stage conditions in execution history	358
Delete a pipeline	361
Delete a pipeline (console)	361
Delete a pipeline (CLI)	361
Create a pipeline that uses resources from another account	363
Prerequisite: Create an Amazon KMS encryption key	365
Step 1: Set up account policies and roles	365
Step 2: Edit the pipeline	373
Migrate polling pipelines to use event-based change detection	377
How to migrate polling pipelines	377
Viewing polling pipelines in your account	378
Migrate polling pipelines with a CodeCommit source	384
Migrate polling pipelines with an S3 source enabled for events	405
Migrate polling pipelines with an S3 source and CloudTrail trail	433
Migrate polling pipelines for a GitHub (via OAuth app) source action to connections	468
Migrate polling pipelines for a GitHub (via OAuth app) source action to webhooks	472
Create the CodePipeline service role	489
Create the CodePipeline service role (console)	490
Create the CodePipeline service role (CLI)	490
Tagging resources	492
Tag a pipeline	493
Tag pipelines (console)	494
Tag pipelines (CLI)	495
Create a notification rule	498
	502
Connect to first-party source providers using source actions	504
Amazon ECR source actions and EventBridge	504
Create an EventBridge rule for an Amazon ECR source (console)	505
Create an EventBridge rule for an Amazon ECR source (CLI)	507
Create an EventBridge rule for an Amazon ECR source (Amazon CloudFormation	
template)	511
Connecting to Amazon S3 source actions that use EventBridge events	516
Create pipelines with an S3 source enabled for events (CLI)	517
Create pipelines with an S3 source enabled for events (Amazon CloudFormation	
template)	521

Connecting to Amazon S3 source actions that use EventBridge and Amazon CloudTrail	544
Create an EventBridge rule for an Amazon S3 source (console)	545
Create an EventBridge rule for an Amazon S3 source (CLI)	548
Create an EventBridge rule for an Amazon S3 source (Amazon CloudFormation	
template)	554
CodeCommit source actions and EventBridge	567
Create an EventBridge rule for a CodeCommit source (console)	568
Create an EventBridge rule for a CodeCommit source (CLI)	570
Create an EventBridge rule for a CodeCommit source (Amazon CloudFormation	
template)	575
Add third-party source providers to pipelines using CodeConnections	584
Bitbucket Cloud connections	584
Create a connection to Bitbucket Cloud (console)	586
Create a connection to Bitbucket Cloud (CLI)	589
GitHub connections	591
Create a connection to GitHub (console)	593
Create a connection to GitHub (CLI)	596
GitHub Enterprise Server connections	598
Create a connection to GitHub Enterprise Server (console)	599
Create a host and connection to GitHub Enterprise Server (CLI)	603
GitLab.com connections	606
Create a connection to GitLab.com (console)	608
Create a connection to GitLab.com (CLI)	612
Connections for GitLab self-managed	614
Create a connection to GitLab self-managed (console)	616
Create a host and connection to GitLab self-managed (CLI)	619
Use a connection shared with another account	621
Automate starting pipelines using triggers and filtering	623
Considerations for trigger filters	625
Pull request events for triggers by provider	625
Examples for trigger filters	627
Add trigger on code push with no filter	635
Add trigger with code push or pull request event types	635
Add filters for push and pull request event types (console)	637
Add filters for push and pull request event types (CLI)	639
Add filters for push and pull request event types (Amazon CloudFormation templates)	641

Add trigger to turn off change detection	643
Start and stop pipelines manually	644
Start a pipeline in CodePipeline	644
Start a pipeline manually	646
Start a pipeline on a schedule	647
Start a pipeline with a source revision override	650
Stop a pipeline execution	653
Stop a pipeline execution (console)	654
Stop an Inbound Execution (Console)	658
Stop a pipeline execution (CLI)	658
Stop an Inbound Execution (CLI)	660
View history and set the mode for pipeline executions	662
View executions	662
View pipeline execution history (console)	662
View execution status (console)	664
View an inbound execution (Console)	666
View pipeline execution source revisions (console)	667
View action executions (console)	669
View action artifacts and artifact store information (console)	669
View pipeline details and history (CLI)	670
Set or change the pipeline execution mode	682
Considerations for viewing execution modes	682
Considerations for switching between execution modes	685
Set or change the pipeline execution mode (console)	686
Set the pipeline execution mode (CLI)	687
Roll back or retry stages	691
Configuring stage retry for a failed stage or failed actions	691
Considerations for stage retry	692
Retry a failed stage manually	692
Configure a stage for automatic retry on failure	696
Configuring stage rollback	702
Considerations for rollbacks	702
Roll back a stage manually	702
Configure a stage for automatic rollback	707
View rollback status in execution listing	711
View rollback status details	714

Configure conditions for a stage	719
Use cases for stage conditions	720
Considerations for results configured for stage conditions	720
Considerations for rules configured for stage conditions	721
Creating Entry conditions	721
Creating Entry conditions - CloudWatchAlarm rule example (Console)	722
Creating Entry conditions with Skip result and VariableCheck rule (console)	723
Creating Entry conditions (CLI)	725
Creating Entry conditions (CFN)	727
Creating On Failure conditions	728
Creating On Failure conditions (Console)	728
Creating onFailure conditions with a Retry result example (Console)	729
Creating On Failure conditions (CLI)	730
Creating On Failure conditions (CFN)	732
Creating On Success conditions	733
Creating On Success conditions (Console)	733
Creating On Success conditions (CLI)	735
Create an On Success condition (CFN)	737
Deleting stage conditions	738
Overriding stage conditions	739
Use action types, custom actions, and approval actions	741
Working with action types	741
Request an action type	743
Add an available action type to a pipeline (console)	749
View an action type	751
Update an action type	752
Create a custom action for a pipeline	754
Create a custom action	756
Create a job worker for your custom action	760
Add a custom action to a pipeline	766
Tag a custom action in CodePipeline	769
Add tags to a custom action	769
View tags for a custom action	770
Edit tags for a custom action	770
Remove tags from a custom action	771
Invoke a Lambda function in a pipeline	771

Step 1: Create a pipeline	773
Step 2: Create the Lambda function	774
Step 3: Add the Lambda function to a pipeline in the CodePipeline console	779
Step 4: Test the pipeline with the Lambda function	780
Step 5: Next steps	780
Example JSON event	781
Additional sample functions	783
Add a manual approval action to a stage	796
Configuration options for manual approval actions	796
Setup and workflow overview for approval actions	797
Grant approval permissions to an IAM user in CodePipeline	798
Grant Amazon SNS permissions to a service role	. 801
Add a manual approval action	803
Approve or reject an approval action	806
JSON data format for manual approval notifications	810
Add a cross-Region action to a pipeline	811
Manage cross-Region actions in a pipeline (console)	813
Add a cross-Region action to a pipeline (CLI)	815
Add a cross-Region action to a pipeline (Amazon CloudFormation)	821
Working with variables	823
Configure actions for variables	. 824
View output variables	829
Example: Use variables in manual approvals	831
Example: Use a BranchName variable with CodeBuild environment variables	832
Working with stage transitions	835
Disable or enable transitions (console)	835
Disable or enable transitions (CLI)	837
Monitoring pipelines	839
Monitoring CodePipeline events	840
Detail types	841
Pipeline-level events	844
Stage-level events	852
Action-level events	856
Create a Rule That Sends a Notification on a Pipeline Event	864
Events placeholder bucket reference	869
Events placeholder bucket names by Region	870

Logging API calls with Amazon CloudTrail87	0'
CodePipeline information in CloudTrail	<i>'</i> 0
Understanding CodePipeline log file entries	11
CodePipeline CloudWatch metrics 87	'3
PipelineDuration	' 4
FailedPipelineExecutions	<i>'</i> 4
Troubleshooting	15
Pipeline error: A pipeline configured with Amazon Elastic Beanstalk returns an error	
message: "Deployment failed. The provided role does not have sufficient permissions:	
Service:AmazonElasticLoadBalancing" 87	<i>'</i> 6
Deployment error: A pipeline configured with an Amazon Elastic Beanstalk deploy action	
hangs instead of failing if the "DescribeEvents" permission is missing	7
Pipeline error: A source action returns the insufficient permissions message: "Could not access	
the CodeCommit repository repository-name. Make sure that the pipeline IAM role has	
sufficient permissions to access the repository."	7
Pipeline error: A Jenkins build or test action runs for a long time and then fails due to lack of	
credentials or permissions	7
Pipeline error: A pipeline created in one Amazon Region using a bucket created in another	
Amazon Region returns an "InternalError" with the code "JobFailed"	'8
Deployment error: A ZIP file that contains a WAR file is deployed successfully to Amazon	
Elastic Beanstalk, but the application URL reports a 404 not found error	7
Pipeline artifact folder names appear to be truncated	'9
Add CodeBuild GitClone permissions for connections to Bitbucket, GitHub, GitHub Enterprise	
Server, or GitLab.com	'9
Add CodeBuild GitClone permissions for CodeCommit source actions	31
Pipeline error: A deployment with the CodeDeployToECS action returns an error message:	
"Exception while trying to read the task definition artifact file from: <source artifact<="" td=""/> <td></td>	
name>"	32
GitHub (via OAuth app) source action: Repository list shows different repositories	32
GitHub (via GitHub App) source action: Unable to complete the connection for a repository . 88	3
Amazon S3 error: CodePipeline service role <arn> is getting S3 access denied for the S3</arn>	
bucket <bucketname> 88</bucketname>	33
Pipelines with an Amazon S3, Amazon ECR, or CodeCommit source no longer start	
automatically	36
Connections error when connecting to GitHub: "A problem occurred, make sure cookies are	
enabled in your browser" or "An organization owner must install the GitHub app"	37

Pipelines with execution mode changed to QUEUED or PARALLEL mode fails when run limi reached	
Pipelines in PARALLEL mode have an outdated pipeline definition if edited when changing	
QUEUED or SUPERSEDED mode	
Pipelines changed from PARALLEL mode will display a previous execution mode	888
Pipelines with connections that use trigger filtering by file paths might not start at branch	
creation	889
Pipelines with connections that use trigger filtering by file paths might not start when file limit is reached	889
CodeCommit or S3 source revisions in PARALLEL mode might not match EventBridge event	000
EC2 Deploy action fails with an error message No such file	
EKS Deploy action fails with a cluster unreachable error message	
Need help with a different issue?	
Security	
Data protection	
Internetwork traffic privacy	
Encryption at rest	
Encryption in transit	
Configure server-side encryption for artifacts stored in Amazon S3 for CodePipeline	
Use Amazon Secrets Manager to track database passwords or third-party API keys	
Identity and access management	
Audience	900
Authenticating with identities	901
Managing access using policies	903
How Amazon CodePipeline works with IAM	905
Identity-based policy examples	911
Resource-based policy examples	947
Troubleshooting	949
CodePipeline permissions reference	951
Manage the CodePipeline service role	961
Incident response	967
Compliance validation	968
Resilience	969
Infrastructure security	969
Security best practices	969

Pipeline structure reference	971
Pipeline declaration	
name	
roleArn	
artifactStore OR artifactStores	
stages	
version	
executionMode	
pipelineType	
variables	
triggers	
metadata	
Stage declaration	
name	
actions	
conditions	
rules	
Action declaration	
name	
region	
roleArn	
namespace	
actionTypeId	
InputArtifacts	
outputArtifacts	
configuration (by action provider)	998
runOrder	
Valid action providers in CodePipeline	1000
Valid settings for the PollForSourceChanges parameter	1005
Valid input and output artifacts for each action type	1007
Valid configuration parameters for each provider type	1009
Action structure reference	1013
Amazon EC2 action reference	
Action type	
Configuration parameters	1015

	Input artifacts	1018
	Output artifacts	1019
	Service role policy permissions for the EC2 deploy action	1019
	Deploy spec file reference	1021
	Action declaration	1023
	Action declaration with Deploy spec example	1024
	See also	1025
Ar	mazon ECR source action reference	1026
	Action type	1027
	Configuration parameters	1027
	Input artifacts	1027
	Output artifacts	1028
	Output variables	1028
	Service role permissions: Amazon ECR action	1029
	Action declaration (Amazon ECR example)	1029
	See also	1030
EC	RBuildAndPublish build action reference	1030
	Action type	1031
	Configuration parameters	1032
	Input artifacts	1033
	Output artifacts	1033
	Output variables	1033
	Service role permissions: ECRBuildAndPublish action	1033
	Action declaration	1035
	See also	1036
Ar	mazon ECS and CodeDeploy blue-green deploy action reference	1036
	Action type	1037
	Configuration parameters	1038
	Input artifacts	1039
		1055
	Output artifacts	
	•	1040
	Output artifacts	1040 1040
	Output artifacts Service role permissions: CodeDeployToECS action	1040 1040 1042
Ar	Output artifacts Service role permissions: CodeDeployToECS action Action declaration	1040 1040 1042 1044
Ar	Output artifacts Service role permissions: CodeDeployToECS action Action declaration See also	1040 1040 1042 1044 1045

	Input artifacts	1047
	Output artifacts	1047
	Service role permissions: Amazon ECS standard action	1047
	Action declaration	1049
	See also	1050
Ar	nazon Elastic Kubernetes Service EKS deploy action reference	1051
	Action type	1052
	Configuration parameters	1052
	Input artifacts	1053
	Output artifacts	1053
	Environment variables	1054
	Output variables	1054
	Service role policy permissions	1054
	Action declaration	
	See also	1057
Ar	nazon Lambda deploy action reference	1058
	Action type	
	Configuration parameters	
	Input artifacts	
	Output artifacts	
	Output variables	
	Service role policy permissions for the Lambda deploy action	1062
	Action declaration	
	See also	
Ar	nazon S3 deploy action reference	
	Action type	
	Configuration parameters	
	Input artifacts	
	Output artifacts	
	Service role permissions: S3 deploy action	
	Example action configuration	
	See also	
Αr	nazon S3 source action reference	
<i>,</i> 11	Action type	
	Configuration parameters	
	Input artifacts	

Output artifacts	1075
Output variables	
Service role permissions: S3 source action	1076
Action declaration	1077
See also	1078
Amazon AppConfig deploy action reference	1078
Action type	1079
Configuration parameters	1079
Input artifacts	1079
Output artifacts	1080
Service role permissions: AppConfig action	1080
Example action configuration	1080
See also	1082
Amazon CloudFormation deploy action reference	1082
Action type	1083
Configuration parameters	1083
Input artifacts	1088
Output artifacts	1088
Output variables	1089
Service role permissions: Amazon CloudFormation action	1089
Action declaration	1091
See also	1092
Amazon CloudFormation StackSets	1092
How Amazon CloudFormation StackSets actions work	1094
How to structure StackSets actions in a pipeline	1095
The CloudFormationStackSet action	1097
The CloudFormationStackInstances action	1110
Service role permissions: CloudFormationStackSet action	1120
Service role permissions: CloudFormationStackInstances action	1121
Permissions models for stack set operations	1121
Template parameter data types	1122
See also	1092
Amazon CodeBuild build and test action reference	1124
Action type	1124
Configuration parameters	
Input artifacts	1127

Output artifacts	1128
Output variables	1128
Service role permissions: CodeBuild action	1129
Action declaration (CodeBuild example)	1129
See also	1131
Amazon CodePipeline invoke action reference	1131
Action type	1132
Configuration parameters	1132
Input artifacts	1134
Output artifacts	1135
Service role policy permissions for the CodePipeline invoke action	1135
Action declaration	1135
See also	1136
Amazon CodeCommit source action reference	1136
Action type	1137
Configuration parameters	1138
Input artifacts	1139
Output artifacts	1139
Output variables	1140
Service role permissions: CodeCommit action	1140
Example action configuration	1141
See also	1143
Amazon CodeDeploy deploy action reference	1144
Action type	1144
Configuration parameters	1144
Input artifacts	1145
Output artifacts	1145
Service role permissions: Amazon CodeDeploy action	1145
Action declaration	1146
See also	1148
CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server,	
GitLab.com, and GitLab self-managed actions	1148
Action type	1151
Configuration parameters	1152
Input artifacts	1153
Output artifacts	1153

Output variables	1154
Service role permissions: CodeConnections action	1155
Action declaration	1155
Installing the installation app and creating a connection	1156
See also	1157
Commands action reference	1158
Considerations for the Commands action	1159
Service role policy permissions	1160
Action type	1161
Configuration parameters	1161
Input artifacts	1166
Output artifacts	1166
Environment variables	1166
Service role permissions: Commands action	1168
Action declaration (example)	1168
See also	1170
Amazon Device Farm test action reference	1170
Action type	1170
Configuration parameters	1171
Input artifacts	1175
Output artifacts	1175
Service role permissions: Amazon Device Farm action	1175
Action declaration	1176
See also	1177
Elastic Beanstalk deploy action reference	1178
Action type	1178
Configuration parameters	1178
Input artifacts	1179
Output artifacts	1179
Service role permissions: ElasticBeanstalk deploy action	1179
Action declaration	1180
See also	1181
Amazon Inspector InspectorScan invoke action reference	1181
Action type ID	1182
Configuration parameters	1183
Input artifacts	1185

Output artifacts	85
Output variables	
Service role permissions: InspectorScan action	85
Action declaration 11	
See also	87
Amazon Lambda invoke action reference 11	87
Action type 11	88
Configuration parameters 11	88
Input artifacts	89
Output artifacts 11	89
Output variables	89
Example action configuration	89
Example JSON event 11	90
See also	93
Amazon OpsWorks deploy action reference 11	93
Action type 11	93
Configuration parameters 11	93
Input artifacts	94
Output artifacts 11	94
Service role permissions: Amazon OpsWorks action 11	94
Example action configuration 11	95
See also 11	96
Amazon Service Catalogdeploy action reference 11	96
Action type 11	96
Configuration parameters 11	96
Input artifacts 11	97
Output artifacts 11	97
Service role permissions: Service Catalog action 11	97
Example action configurations by type of configuration file	98
See also 11	99
Amazon Step Functions 12	200
Action type 11	93
Configuration parameters 12	200
Input artifacts	202
Output artifacts 12	202
Output variables	202

Service role permissions: StepFunctions action	1203
Example action configuration	1203
Behavior	
See also	
Rule structure reference	1209
CloudWatchAlarm	1209
Rule type	1210
Configuration parameters	1210
Example rule configuration	1210
See also	1211
CodeBuild rule	
Service role policy permissions	1212
Rule type	1213
Configuration parameters	1213
Example rule configuration	1215
See also	1216
Commands	1216
Considerations for the Commands rule	1216
Service role policy permissions	1212
Rule type	1213
Configuration parameters	1213
Example rule configuration	1215
See also	1216
DeploymentWindow	1221
Rule type	1222
Configuration parameters	1222
Example rule configuration	1224
See also	1225
LambdaInvoke	1225
Rule type	1210
Configuration parameters	1226
Example rule configuration	1226
See also	1227
VariableCheck	1227
Rule type	1228
Configuration parameters	

Example rule configuration	1231
See also	1231
Integration model reference	1233
How third-party action types work with the integrator	1233
Concepts	1234
Supported integration models	1235
Lambda integration model	1237
Update your Lambda function to handle the input from CodePipeline	1237
Return the results from your Lambda function to CodePipeline	1242
Use continuation tokens to wait for results from an asynchronous process	1243
Provide CodePipeline the permissions to invoke the integrator Lambda function at	
runtime	1244
Job worker integration model	1244
Choose and configure a permissions management strategy for your job worker	1245
Image definitions file reference	1247
imagedefinitions.json file for Amazon ECS standard deployment actions	1247
imageDetail.json file for Amazon ECS blue/green deployment actions	1250
Variables reference	1255
Concepts	1256
Variables	1256
Namespaces	1257
Use cases for variables	1258
Configuring variables	1259
Configuring variables at the pipeline level	1259
Configuring variables at the action level	1260
Variable resolution	1262
Rules for variables	1263
Variables available for pipeline actions	1263
Actions with defined variable keys	1263
Actions with user-configured variable keys	1267
Working with glob patterns in syntax	1270
Update polling pipelines to the recommended change detection method	1272
Update a GitHub (via OAuth app) source action to a GitHub (via GitHub App) source action 1	273
Step 1: Replace your (via OAuth app) GitHub action	1274
Step 2: Create a connection to GitHub	1275
Step 3: Save your GitHub source action	1275

Quotas	1277
Appendix A: GitHub (via OAuth app) source actions	1293
Adding a GitHub (via OAuth app) source action	1294
GitHub (via OAuth app) source action reference	1295
Action type	1296
Configuration parameters	1296
Input artifacts	1298
Output artifacts	
Output variables	1298
Action declaration (GitHub example)	1299
Connecting to GitHub (OAuth)	1300
See also	1301
Document history	1302
Earlier updates	1332
CodePipeline feature reference	1343

What is Amazon CodePipeline?

Amazon CodePipeline is a continuous delivery service you can use to model, visualize, and automate the steps required to release your software. You can quickly model and configure the different stages of a software release process. CodePipeline automates the steps required to release your software changes continuously. For information about pricing for CodePipeline, see <u>Pricing</u>.

Topics

- <u>Continuous delivery and continuous integration</u>
- What can I do with CodePipeline?
- A quick look at CodePipeline
- How do I get started with CodePipeline?
- CodePipeline concepts
- DevOps pipeline example
- How pipeline executions work
- Input and output artifacts
- How do stage conditions work?
- Pipeline types
- What type of pipeline is right for me?

Continuous delivery and continuous integration

CodePipeline is a *continuous delivery* service that automates the building, testing, and deployment of your software into production.

<u>Continuous delivery</u> is a software development methodology where the release process is automated. Every software change is automatically built, tested, and deployed to production. Before the final push to production, a person, an automated test, or a business rule decides when the final push should occur. Although every successful software change can be immediately released to production with continuous delivery, not all changes need to be released right away.

<u>Continuous integration</u> is a software development practice where members of a team use a version control system and frequently integrate their work to the same location, such as a main branch.

Each change is built and verified to detect integration errors as quickly as possible. Continuous integration is focused on automatically building and testing code, as compared to *continuous delivery*, which automates the entire software release process up to production.

For more information, see <u>Practicing Continuous Integration and Continuous Delivery on Amazon:</u> Accelerating Software Delivery with DevOps.

You can use the CodePipeline console, the Amazon Command Line Interface (Amazon CLI), the Amazon SDKs, or any combination of these to create and manage your pipelines.

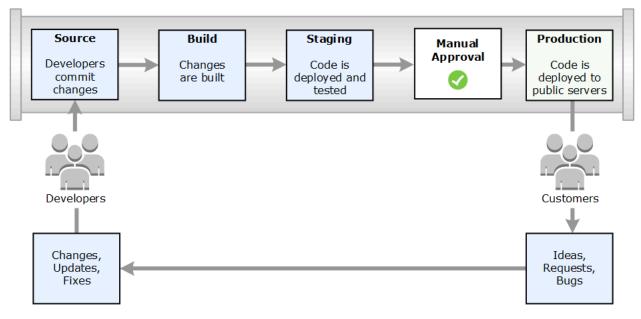
What can I do with CodePipeline?

You can use CodePipeline to help you automatically build, test, and deploy your applications in the cloud. Specifically, you can:

- Automate your release processes: CodePipeline fully automates your release process from end to end, starting from your source repository through build, test, and deployment. You can prevent changes from moving through a pipeline by including a manual approval action in any stage except a Source stage. You can release when you want, in the way you want, on the systems of your choice, across one instance or multiple instances.
- Establish a consistent release process: Define a consistent set of steps for every code change. CodePipeline runs each stage of your release according to your criteria.
- **Speed up delivery while improving quality**: You can automate your release process to allow your developers to test and release code incrementally and speed up the release of new features to your customers.
- Use your favorite tools: You can incorporate your existing source, build, and deployment tools into your pipeline. For a full list of Amazon Web Services services and third-party tools currently supported by CodePipeline, see Product and service integrations with CodePipeline.
- View progress at a glance: You can review real-time status of your pipelines, check the details of any alerts, retry failed stages or actions, view details about the source revisions used in the latest pipeline execution in each stage, and manually rerun any pipeline.
- View pipeline history details: You can view details about executions of a pipeline, including start and end times, run duration, and execution IDs.

A quick look at CodePipeline

The following diagram shows an example release process using CodePipeline.



In this example, when developers commit changes to a source repository, CodePipeline automatically detects the changes. Those changes are built, and if any tests are configured, those tests are run. After the tests are complete, the built code is deployed to staging servers for testing. From the staging server, CodePipeline runs more tests, such as integration or load tests. Upon the successful completion of those tests, and after a manual approval action that was added to the pipeline is approved, CodePipeline deploys the tested and approved code to production instances.

CodePipeline can deploy applications to EC2 instances by using CodeDeploy, Amazon Elastic Beanstalk, or Amazon OpsWorks Stacks. CodePipeline can also deploy container-based applications to services by using Amazon ECS. Developers can also use the integration points provided with CodePipeline to plug in other tools or services, including build services, test providers, or other deployment targets or systems.

A pipeline can be as simple or as complex as your release process requires.

How do I get started with CodePipeline?

To get started with CodePipeline:

- 1. Learn how CodePipeline works by reading the CodePipeline concepts section.
- 2. **Prepare** to use CodePipeline by following the steps in <u>Getting started with CodePipeline</u>.
- 3. **Experiment** with CodePipeline by following the steps in the <u>CodePipeline tutorials</u> tutorials.

4. **Use** CodePipeline for your new or existing projects by following the steps in <u>Create a pipeline</u>, stages, and actions.

CodePipeline concepts

Modeling and configuring your automated release process is easier if you understand the concepts and terms used in Amazon CodePipeline. Here are some concepts to know about as you use CodePipeline.

For an example of a DevOps pipeline, see <u>DevOps pipeline example</u>.

The following terms are used in CodePipeline:

Topics

- Pipelines
- Pipeline executions
- Stage operations
- Action executions
- Execution types
- <u>Action types</u>
- <u>Artifacts</u>
- Source revisions
- Triggers
- Variables
- Conditions
- Rules

Pipelines

A *pipeline* is a workflow construct that describes how software changes go through a release process. Each pipeline is made up of a series of *stages*.

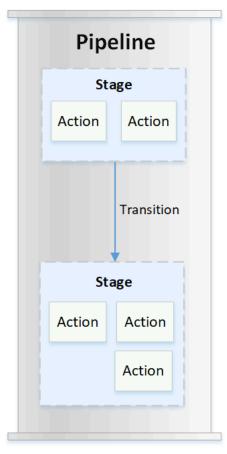
Stages

A stage is a logical unit you can use to isolate an environment and to limit the number of concurrent changes in that environment. Each stage contains actions that are performed on the

application <u>artifacts</u>. Your source code is an example of an artifact. A stage might be a build stage, where the source code is built and tests are run. It can also be a deployment stage, where code is deployed to runtime environments. Each stage is made up of a series of serial or parallel *actions*.

Transitions

A *transition* is the point where a pipeline execution moves to the next stage in the pipeline. You can disable a stage's inbound transition to prevent executions from entering that stage, and then you can enable the transition to allow executions to continue. When more than one execution arrives at a disabled transition, only the latest execution continues to the next stage when the transition is enabled. This means that newer executions continue to supersede waiting executions while the transition is disabled, and then after the transition is enabled, the execution that continues is the superseding execution.



Actions

An *action* is a set of operations performed on application code and configured so that the actions run in the pipeline at a specified point. This can include things like a source action from a code change, an action for deploying the application to instances, and so on. For example, a deployment

stage might contain a deployment action that deploys code to a compute service like Amazon EC2 or Amazon Lambda.

Valid CodePipeline action types are source, build, test, deploy, approval, and invoke. For a list of action providers, see Valid action providers in CodePipeline.

Actions can run in series or in parallel. For information about serial and parallel actions in a stage, see the runOrder information in <u>action structure requirements</u>.

Pipeline executions

An *execution* is a set of changes released by a pipeline. Each pipeline execution is unique and has its own ID. An execution corresponds to a set of changes, such as a merged commit or a manual release of the latest commit. Two executions can release the same set of changes at different times.

While a pipeline can process multiple executions at the same time, a pipeline stage processes only one execution at a time. To do this, a stage is locked while it processes an execution. Two pipeline executions can't occupy the same stage at the same time. The execution waiting to enter the occupied stage is referred to an *inbound execution*. An inbound execution can still fail, be superseded, or be manually stopped. For more information about how inbound executions work, see <u>How Inbound Executions Work</u>.

Pipeline executions traverse pipeline stages in order. Valid statuses for pipelines are InProgress, Stopping, Stopped, Succeeded, Superseded, and Failed.

For more information, see <u>PipelineExecution</u>.

Stopped executions

The pipeline execution can be stopped manually so that the in-progress pipeline execution does not continue through the pipeline. If stopped manually, a pipeline execution shows a Stopping status until it is completely stopped. Then it shows a Stopped status. A Stopped pipeline execution can be retried.

There are two ways to stop a pipeline execution:

- Stop and wait
- Stop and abandon

For information about use cases for stopping an execution and sequence details for these options, see How pipeline executions are stopped.

Failed executions

If an execution fails, it stops and does not completely traverse the pipeline. Its status is FAILED status and the stage is unlocked. A more recent execution can catch up and enter the unlocked stage and lock it. You can retry a failed execution unless the failed execution has been superseded or is not retryable. You can roll back a failed stage to a previous successful execution.

Execution modes

To deliver the latest set of changes through a pipeline, newer executions pass and replace less recent executions already running through the pipeline. When this occurs, the older execution is superseded by the newer execution. An execution can be superseded by a more recent execution at a certain point, which is the point between stages. SUPERSEDED is the default execution mode.

In SUPERSEDED mode, if an execution is waiting to enter a locked stage, a more recent execution might catch up and supersede it. The newer execution now waits for the stage to unlock, and the superseded execution stops with a SUPERSEDED status. When a pipeline execution is superseded, the execution is stopped and does not completely traverse the pipeline. You can no longer retry the superseded execution after it has been replaced at this stage. Other available execution modes are PARALLEL or QUEUED mode.

For more information about execution modes and locked stages, see <u>How executions are processed</u> in <u>SUPERSEDED mode</u>.

Stage operations

When a pipeline execution runs through a stage, the stage is in the process of completing all of the actions within it. For information about how stage operations work and information about locked stages, see <u>How executions are processed in SUPERSEDED mode</u>.

Valid statuses for stages are InProgress, Stopping, Stopped, Succeeded, and Failed. You can retry a failed stage unless the failed stage is not retryable. For more information, see <u>StageExecution</u>. You can roll back a stage to a specified previous successful execution. A stage can be configured to roll back automatically on failure as detailed in <u>Configuring stage rollback</u>. For more information, see <u>RollbackStage</u>. An *action execution* is the process of completing a configured action that operates on designated <u>artifacts</u>. These can be input artifacts, output artifacts, or both. For example, a build action might run build commands on an input artifact, such as compiling application source code. Action execution details include an action execution ID, the related pipeline execution source trigger, and the input and output artifacts for the action.

Valid statuses for actions are InProgress, Abandoned, Succeeded, or Failed. For more information, see <u>ActionExecution</u>.

Execution types

A pipeline or stage execution can be either a standard or a rolled-back execution.

For standard types, the execution has a unique ID and is a full pipeline run. A pipeline rollback has a stage to be rolled back and a successful execution for the stage as the target execution to which to roll back. The target pipeline execution is used to retrieve source revisions and variables for the stage to rerun.

Action types

Action types are preconfigured actions that are available for selection in CodePipeline. The action type is defined by its owner, provider, version, and category. The action type provides customized parameters that are used to complete the action tasks in a pipeline.

For information about the Amazon Web Services services and third-party products and services you can integrate into your pipeline based on action type, see <u>Integrations with CodePipeline action</u> types.

For information about the integration models supported for action types in CodePipeline, see Integration model reference.

For information about how third-party providers can set up and manage action types in CodePipeline, see <u>Working with action types</u>.

Artifacts

Artifacts refers to the collection of data, such as application source code, built applications, dependencies, definitions files, templates, and so on, that is worked on by pipeline actions.

Artifacts are produced by some actions and consumed by others. In a pipeline, artifacts can be the set of files worked on by an action (*input artifacts*) or the updated output of a completed action (*output artifacts*).

Actions pass output to another action for further processing using the pipeline artifact bucket. CodePipeline copies artifacts to the artifact store, where the action picks them up. For more information about artifacts, see Input and output artifacts.

Source revisions

When you make a source code change, a new version is created. A *source revision* is the version of a source change that triggers a pipeline execution. An execution processes source revisions. For GitHub and CodeCommit repositories, this is the commit. For S3 buckets or actions, this is the object version.

You can start a pipeline execution with a source revision, such as a commit, that you specify. The execution will process the specified revision and override what would have been the revision used for the execution. For more information, see <u>Start a pipeline with a source revision override</u>.

Triggers

Triggers are events that start your pipeline. Some triggers, such as starting a pipeline manually, are available for all source action providers in a pipeline. Certain triggers depend on the source provider for a pipeline. For example, CloudWatch events must be configured with event resources from Amazon CloudWatch that have the pipeline ARN added as a target in the event rule. Amazon CloudWatch Events is the recommended trigger for automatic change detection for pipelines with a CodeCommit or S3 source action. Webhooks are a type of trigger configured for third-party repository events. For example, WebhookV2 is a trigger type that allows Git tags to be used to start pipelines with third-party source providers such as GitHub.com, GitHub Enterprise Server, GitLab.com, GitLab self-managed, or Bitbucket Cloud. In the pipeline configuration, you can specify a filter for triggers, such as push or pull request. You can filter code push events on Git tags, branches, or file paths. You can filter pull request events on event (opened, updated, closed), branches, or file paths.

For more information about triggers, see <u>Start a pipeline in CodePipeline</u>. For a tutorial that walks you through using Git tags as triggers for your pipeline, see <u>Tutorial: Use Git tags to start your pipeline</u>.

🛕 Important

Pipelines that are inactive for longer than 30 days will have polling disabled for the pipeline. For more information, see <u>pollingDisabledAt</u> in the pipeline structure reference. For the steps to migrate your pipeline from polling to event-based change detection, see <u>Change Detection Methods</u>.

Variables

A *variable* is a value that can be used to dynamically configure actions in your pipeline. Variables can be either declared on the pipeline level, or emitted by actions in the pipeline. Variable values are resolved at the time of pipeline execution and can be viewed in the execution history. For variables declared at the pipeline level, you can either define default values in the pipeline configuration, or override them for a given execution. For variables emitted by an action, the value is available after an action succesfully completes. For more information, see <u>Variables reference</u>.

Conditions

A *condition* contains a set of rules that are evaluated. If all rules in a condition succeed, then the condition is met. You can configure conditions so that when the criteria are not met, the specified result, such as failing the stage, engages. Conditions are also referred to as gates because they allow you to specify when an execution will enter and run through a stage or exit the stage after running through it. This is analogous to allowing a line of traffic on a roadway to gather at a closed gate, and then specifying the opening of the gate to allow flow of traffic into an area. Results for condition types include failing the stage or rolling back the stage. Conditions help you to specify when these actions happen in a pipeline stage. You can override conditions at runtime.

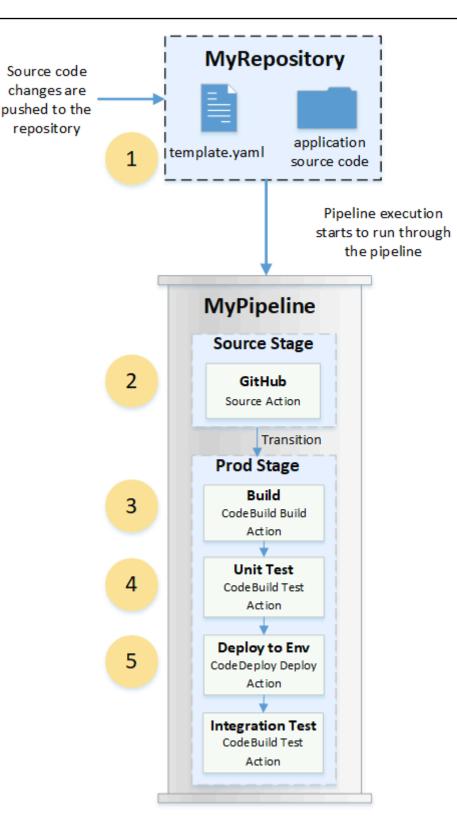
There are three types of conditions. Entry conditions answer the question "If the rules for the condition are met, then enter the stage." The stage is locked when the execution enters the stage, and then the rules are run. For On Failure conditions, the rule engages when a stage has failed, with a result of rolling back a failed stage. For On Success conditions, the rule engages when a stage is successful, such as checking a successful run for alarms before proceeding. For example, an On Success condition would result in a rollback of a successful stage if the CloudWatchAlarm rule finds that there are alarms in the deployment environment. For more information, see <u>How do stage conditions work?</u>.

Rules

Conditions use one or more preconfigured *rules* that run and perform checks that will then engage the configured result for when the condition is not met. For example, meeting all rules for an Entry condition rule that checks for alarm status and deployment window times will deploy a successful stage after all checks pass. For more information, see <u>How do stage conditions work?</u>.

DevOps pipeline example

As an example of a DevOps pipeline, a two-stage pipeline might have a source stage called **Source** and a second stage called **Prod**. In this example, the pipeline is updating the application with the latest changes and continuously deploying the latest result. Before it deploys the latest application, the pipeline builds and tests the web application. In this example, a group of developers have set up an infrastructure template and the source code for a web application in a GitHub repository called MyRepository.



For example, a developer pushes a fix to the web application's index page, and the following occurs:

- 1. The application source code is maintained in a repository configured as a GitHub source action in the pipeline. When developers push commits to the repository, CodePipeline detects the pushed change, and a pipeline execution starts from the **Source Stage**.
- 2. The GitHub source action completes successfully (that is, the latest changes have been downloaded and stored to the artifact bucket unique to that execution). The *output artifacts* produced by the GitHub source action, which are the application files from the repository, are then used as the *input artifacts* to be worked on by the actions in the next stage.
- 3. The pipeline execution transitions from the **Source Stage** to the **Prod Stage**. The first action in the **Prod Stage** runs a build project created in CodeBuild and configured as a build action in the pipeline. The build task pulls a build environment image and builds the web application in a virtual container.
- 4. The next action in the **Prod Stage** is a unit test project created in CodeBuild and configured as a test action in the pipeline.
- 5. The unit tested code is next worked on by a deploy action in the **Prod Stage** that deploys the application to a production environment. After the deploy action completes successfully, the final action in the stage is an integration testing project created in CodeBuild and configured as a test action in the pipeline. The test action calls to shell scripts that install and run a test tool, such as a link checker, on the web application. After successful completion, the output is a built web application and a set of test results.

Developers can add actions to the pipeline that deploy or further test the application after it is built and tested for each change.

For more information, see <u>How pipeline executions work</u>.

How pipeline executions work

This section provides an overview of the way CodePipeline processes a set of changes. CodePipeline tracks each pipeline execution that starts when a pipeline is started manually or a change is made to the source code. CodePipeline uses the following execution modes to handle the way each execution progresses through the pipeline. For more information, see <u>Set or change the</u> <u>pipeline execution mode</u>.

- SUPERSEDED mode: A more recent execution can overtake an older one. This is the default.
- QUEUED mode: Executions are processed one by one in the order that they are queued. This requires pipeline type V2.

 PARALLEL mode: In PARALLEL mode, executions run simultaneously and independently of one another. Executions don't wait for other runs to complete before starting or finishing. This requires pipeline type V2.

<u> Important</u>

For pipelines in PARALLEL mode, stage rollback is not available. Similarly, failure conditions with a rollback result type cannot be added to a PARALLEL mode pipeline.

How pipeline executions are started

You can start an execution when you change your source code or manually start the pipeline. You can also trigger an execution through an Amazon CloudWatch Events rule that you schedule. For example, when a source code change is pushed to a repository configured as the pipeline's source action, the pipeline detects the change and starts an execution.

í) Note

If a pipeline contains multiple source actions, all of them run again, even if a change is detected for one source action only.

How source revisions are processed in pipeline executions

For each pipeline execution that starts with source code changes (source revisions), source revisions are determined as follows.

• For pipelines with a CodeCommit source, the HEAD is cloned by CodePipeline at the moment that the commit is pushed. For example, a commit is pushed, which starts the pipeline for execution 1. At the moment a second commit is pushed, this starts the pipeline for execution 2.

1 Note

For pipelines in PARALLEL mode with a CodeCommit source, regardless of the commit that triggered the pipeline execution, the source action will always clone the HEAD at the time it is started. For more information, see <u>CodeCommit or S3 source revisions in</u> PARALLEL mode might not match EventBridge event .

 For pipelines with an S3 source, the EventBridge event for the S3 bucket update is used. For example, the event is generated when a file is updated in the source bucket, which starts the pipeline for execution 1. At the moment that the event for a second bucket update is made, this starts the pipeline for execution 2.

Note

For pipelines in PARALLEL mode with an S3 source, regardless of the image tag that triggered the execution, the source action will always start with the latest image tag. For more information, see <u>CodeCommit or S3 source revisions in PARALLEL mode might not</u> <u>match EventBridge event</u>.

• For pipelines with a connections source, such as to Bitbucket, the HEAD is cloned by CodePipeline at the moment that the commit is pushed. For example, for a pipeline in PARALLEL mode, a commit is pushed, which starts the pipeline for execution 1, and the second pipeline execution uses the second commit.

How source overrides work with the EventBridge input transformer

You can use overrides to start a pipeline with a specific source revision ID that you provide for the pipeline execution. For example, if you want to start a pipeline that will process a specific commit ID from your CodeCommit source, you can add the commit ID as an override when you start your pipeline.

There are four types of source revision for revisionType:

- COMMIT_ID
- IMAGE_DIGEST
- S3_OBJECT_VERSION_ID
- S3_OBJECT_KEY

🚯 Note

For the COMMIT_ID and IMAGE_DIGEST types of source revisions, the source revision ID applies to all content in the repository, across all branches.

(i) Note

For the S3_OBJECT_VERSION_ID and S3_OBJECT_KEY types of source revisions, either of the types can be used independently, or they can be used together to override the source with a specific ObjectKey and VersionID. For S3_OBJECT_KEY, the configuration parameter AllowOverrideForS3ObjectKey needs to be set to true. For more information on S3 source configuration parameters, see <u>Configuration parameters</u>.

You can specify source overrides using the input transformer in EventBridge. Use the input transformer to pass the data as one of the following:

- You can use the input transformer to pass the data as JSON parameters.
- You can use the input transformer to pass pipeline variables.

For examples of passing the data as JSON parameters, see <u>Amazon ECR source actions and</u> <u>EventBridge resources</u>, <u>Connecting to Amazon S3 source actions that use EventBridge and Amazon</u> CloudTrail for S3, and CodeCommit source actions and EventBridge for CodeCommit.

How pipeline executions are stopped

To use the console to stop a pipeline execution, you can choose **Stop execution** on the pipeline visualization page, on the execution history page, or on the detailed history page. To use the CLI to stop a pipeline execution, you use the stop-pipeline-execution command. For more information, see Stop a pipeline execution in CodePipeline.

There are two ways to stop a pipeline execution:

- **Stop and wait:** All in-progress action executions are allowed to complete, and subsequent actions are not started. The pipeline execution does not continue to subsequent stages. You cannot use this option on an execution that is already in a Stopping state.
- **Stop and abandon:** All in-progress action executions are abandoned and do not complete, and subsequent actions are not started. The pipeline execution does not continue to subsequent stages. You can use this option on an execution that is already in a Stopping state.

i Note

This option can lead to failed tasks or out of sequence tasks.

Each option results in a different sequence of pipeline and action execution phases, as follows.

Option 1: Stop and wait

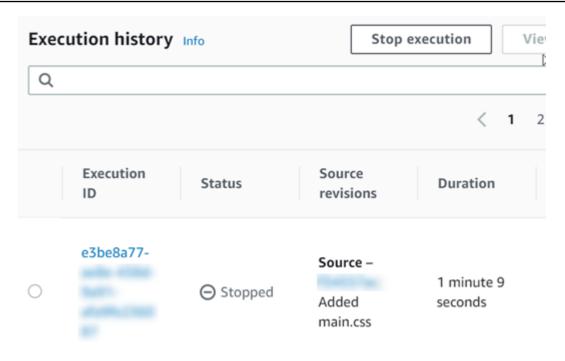
When you choose to stop and wait, the selected execution continues until in-progress actions are completed. For example, the following pipeline execution was stopped while the build action was in progress.

1. In the pipeline view, the success message banner is displayed, and the build action continues until it is completed. The pipeline execution status is **Stopping**.

In the history view, the status for in-progress actions, such as the build action, is **In progress** until the build action is completed. While actions are in progress, the pipeline execution status is **Stopping**.

 The execution stops when the stopping process is complete. If the build action is completed successfully, its status is **Succeeded**, and the pipeline execution shows a status of **Stopped**. Subsequent actions do not start. The **Retry** button is enabled.

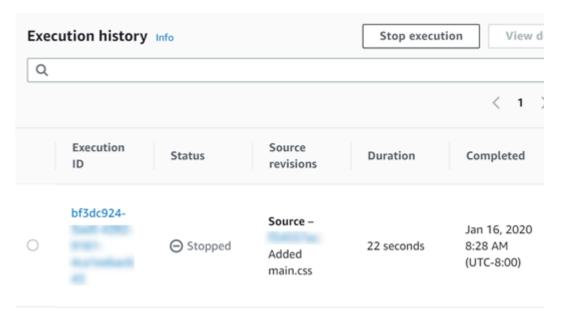
In the history view, the execution status is **Stopped** after the in-progress action is completed.



Option 2: Stop and abandon

When you choose to stop and abandon, the selected execution does not wait for in-progress actions to complete. The actions are abandoned. For example, the following pipeline execution was stopped and abandoned while the build action was in progress.

- 1. In the pipeline view, the success banner message is displayed, the build action shows a status of **In progress**, and the pipeline execution shows a status of **Stopping**.
- 2. After the pipeline execution stops, the build action shows a status of **Abandoned**, and the pipeline execution shows a status of **Stopped**. Subsequent actions do not start. The **Retry** button is enabled.
- 3. In the history view, the execution status is **Stopped**.



Use cases for stopping a pipeline execution

We recommend that you use the stop and wait option to stop a pipeline execution. This option is safer because it avoids possible failed or out-of-sequence tasks in your pipeline. When an action is abandoned in CodePipeline, the action provider continues any tasks related to the action. In the case of an Amazon CloudFormation action, the deployment action in the pipeline is abandoned, but the stack update might continue and result in a failed update.

As an example of abandoned actions that can result in out-of-sequence tasks, if you are deploying a large file (1GB) through an S3 deployment action, and you choose to stop and abandon the action while the deployment is already in progress, the action is abandoned in CodePipeline, but continues in Amazon S3. Amazon S3 does not encounter any instruction to cancel the upload. Next, if you start a new pipeline execution with a very small file, there are now two deployments in progress. Because the file size of the new execution is small, the new deployment completes while the old deployment is still uploading. When the old deployment completes, the new file is overwritten by the old file.

You might want to use the stop and abandon option in the case where you have a custom action. For example, you can abandon a custom action with work that does not need to finish before starting a new execution for a bug fix.

User Guide

How executions are processed in SUPERSEDED mode

The default mode for processing executions is SUPERSEDED mode. An execution consists of a set of changes picked up and processed by the execution. Pipelines can process multiple executions at the same time. Each execution is run through the pipeline separately. The pipeline processes each execution in order and might supersede an earlier execution with a later one. The following rules are used to process executions in a pipeline for SUPERSEDED mode.

Rule 1: Stages are locked when an execution is being processed

Because each stage can process only one execution at a time, the stage is locked while in progress. When the execution completes a stage, it transitions to the next stage in the pipeline.



Before: Stage 1 is locked as Execution 1 enters. After: Stage 2 is locked as Execution 1 enters.

Rule 2: Subsequent executions wait for the stage to be unlocked

While a stage is locked, waiting executions are held in front of the locked stage. All actions configured for a stage must be completed successfully before the stage is considered complete. A failure releases the lock on the stage. When an execution is stopped, the execution does not continue in a stage and the stage is unlocked.

1 Note

Before you stop an execution, we recommend that you disable the transition in front of the stage. This way, when the stage is unlocked due to the stopped execution, the stage does not accept a subsequent pipeline execution.



Before: Stage 2 is locked as Execution 1 enters. **After:** Execution 2 exits Stage 1 and waits between stages.

Rule 3: Waiting executions are superseded by more recent executions

Executions are only superseded in between stages. A locked stage holds one execution at the front of the stage awaiting the stage to complete. A more recent execution overtakes a waiting execution and continues to the next stage as soon as the stage is unlocked. The superseded execution does not continue. In this example, Execution 2 has been superseded by Execution 3 while awaiting the locked stage. Execution 3 enters the stage next.



Before: execution 2 waits between stages while execution 3 enters stage 1. **after:** execution 3 exits stage 1. execution 2 is superseded by execution 3.

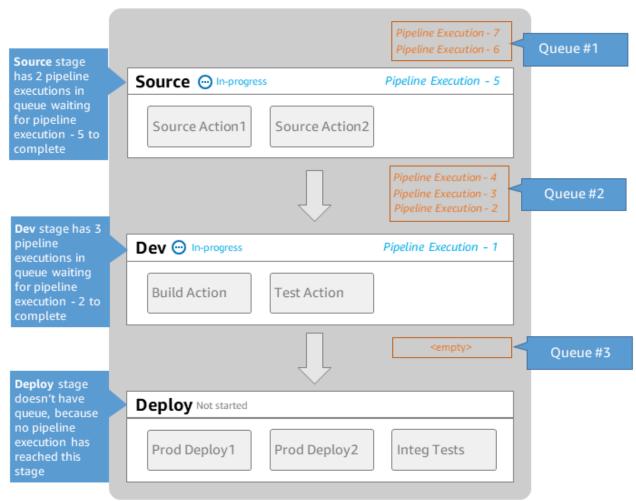
For more information about considerations for viewing and switching between execution modes, see <u>Set or change the pipeline execution mode</u>. For more information about quotas with execution modes, see <u>Quotas in Amazon CodePipeline</u>.

How executions are processed in QUEUED mode

For pipelines in QUEUED mode, stages are locked when an execution is being processed; however, waiting executions do not overtake executions that have already started.

Waiting executions gather at the entry points to locked stages in the order that they reach the stage, forming a queue of waiting executions. With QUEUED mode, you can have multiple queues in the same pipeline. When a queued execution enters a stage, the stage is locked and no other executions can enter. This behavior remains the same as SUPERSEDED mode. When the execution finishes the stage, the stage becomes unlocked and ready for the next execution.

The following diagram shows how stages in a QUEUED mode pipeline process executions. For example, while the Source stage processes execution 5, the executions for 6 and 7 form Queue #1 and wait at the stage entry point. The next execution in the queue will be processed after the stage unlocks.



MyPipeline

Note: maximum of 50 concurrent executions per pipeline

For more information about considerations for viewing and switching between execution modes, see <u>Set or change the pipeline execution mode</u>. For more information about quotas with execution modes, see Quotas in Amazon CodePipeline.

How executions are processed in PARALLEL mode

For pipelines in PARALLEL mode, executions are independent of one another and don't wait for other executions to complete before starting. There are no queues. To view parallel executions in the pipeline, use the execution history view.

Use PARALLEL mode in development environments where each feature has its own feature branch and deploys to targets that are not shared by other users.

For more information about considerations for viewing and switching between execution modes, see <u>Set or change the pipeline execution mode</u>. For more information about quotas with execution modes, see <u>Quotas in Amazon CodePipeline</u>.

Managing Pipeline Flow

The flow of pipeline executions can be controlled by:

• A *transition*, which controls the flow of executions into the stage. Transitions can be enabled or disabled. When a transition is disabled, pipeline executions cannot enter the stage. The pipeline execution waiting to enter a stage where the transition is disabled is called the inbound execution. After you enable the transition, an inbound execution moves into the stage and locks it.

Similar to executions awaiting a locked stage, when a transition is disabled, the execution waiting to enter the stage can still be superseded by a new execution. When a disabled transition is reenabled, the latest execution, including any that superseded older executions while the transition was disabled, enters the stage.

• An *approval action*, which prevents a pipeline from transitioning to the next action until permission is granted (for example, through manual approval from an authorized identity). You might use an approval action when you want to control the time at which a pipeline transitions to a final **Production** stage, for example.

í) Note

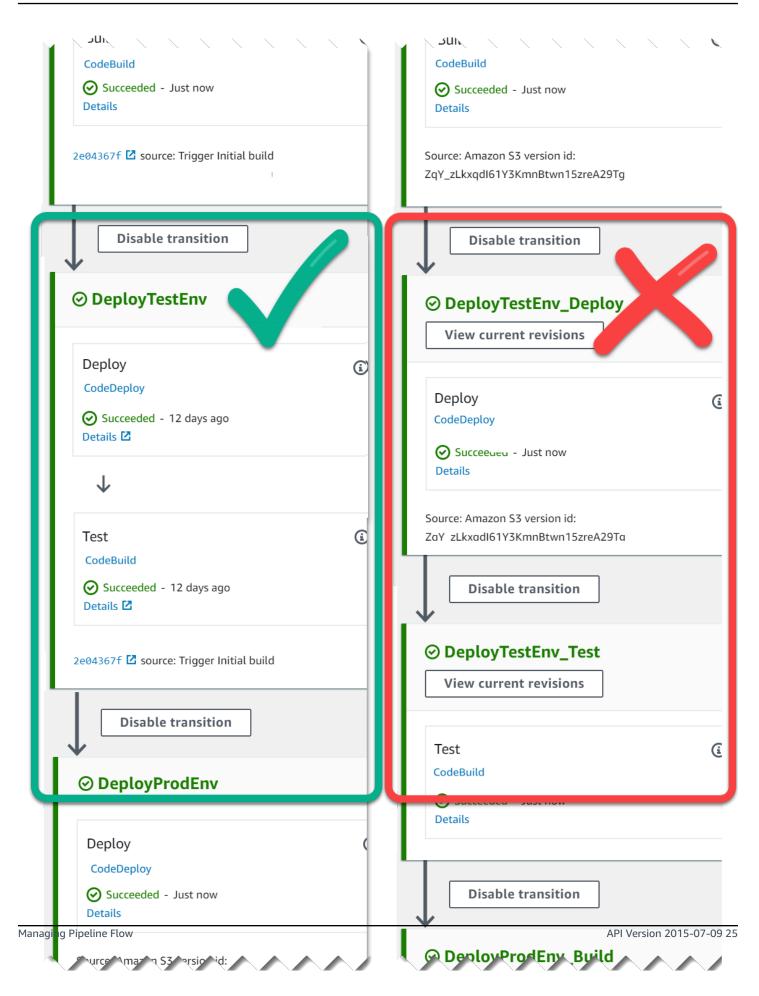
A stage with an approval action is locked until the approval action is approved or rejected or has timed out. A timed-out approval action is processed in the same way as a failed action.

- A *failure*, when an action in a stage does not complete successfully. The revision does not transition to the next action in the stage or the next stage in the pipeline. The following can occur:
 - You manually retry the stage that contains the failed actions. This resumes the execution (it retries failed actions and, if they succeed, continues in the stage/pipeline).
 - Another execution enters the failed stage and supersedes the failed execution. At this point, the failed execution cannot be retried.

Recommended pipeline structure

When deciding how a code change should flow through your pipeline, it is best to group related actions within a stage so that, when the stage locks, the actions all process the same execution. You might create a stage for each application environment, Amazon Web Services Region, or Availability Zone, and so on. A pipeline with too many stages (that is, too granular) can allow too many concurrent changes, while a pipeline with many actions in a large stage (too coarse) can take too long to release a change.

As an example, a test action after a deployment action in the same stage is guaranteed to test the same change that was deployed. In this example, a change is deployed to a Test environment and then tested, and then the latest change from the test environment is deployed to a Production environment. In the recommended example, the Test environment and the Prod environment are separate stages.



Left: related test, deploy, and approval actions grouped together (recommended). **Right:** related actions in separate stages (not recommended).

How Inbound Executions Work

An inbound execution is an execution that is waiting for an unavailable stage, transition, or action to become available before it moves forward. The next stage, transition, or action might be unavailable because:

- Another execution has already entered the next stage and locked it.
- The transition to enter the next stage is disabled.

You might disable a transition to hold an inbound execution if you want to control whether a current execution has time to complete in subsequent stages, or if you want to stop all actions at a certain point. To determine if you have an inbound execution, you can view the pipeline in the console or view the output from the **get-pipeline-state** command.

Inbound executions operate with the following considerations:

- As soon as the action, transition, or locked stage becomes available, the in-progress inbound execution enters the stage and continues through the pipeline.
- While the inbound execution is waiting, it can be manually stopped. An inbound execution can have an InProgress, Stopped, or Failed state.
- When an inbound execution has been stopped or has failed, it cannot be retried because there are no failed actions to retry. When an inbound execution has been stopped, and the transition is enabled, the stopped inbound execution does not continue into the stage.

You can view or stop an inbound execution.

Input and output artifacts

CodePipeline integrates with development tools to check for code changes and then build and deploy through all of the stages of the continuous delivery process. Artifacts are the files that are worked on by actions in the pipeline, such as files or folders with application code, index page files, scripts, and so on. For example, the Amazon S3 source action artifact is a file name (or file path) where the application source code files are provided for the pipeline source action. The files are provided as a ZIP file, such as the following example artifact name: SampleApp_Windows.zip.

The output artifact for the source action, the application source code files, is the output artifact from that action and is the input artifact for the next action, such as a build action. As another example, a build action might run build commands that compile application source code for an input artifact, which is the application source code files. See the action configuration reference page for a specific action for details about artifact parameters, such as <u>Amazon CodeBuild build</u> and test action reference for the CodeBuild action.

Actions use input and output artifacts that are stored in the Amazon S3 artifact bucket you chose when you created the pipeline. CodePipeline zips and transfers the files for input or output artifacts as appropriate for the action type in the stage.

i Note

The artifact bucket is not the same bucket as the bucket used as the source file location for a pipeline where the chosen source action is S3.

For example:

- 1. CodePipeline triggers your pipeline to run when there is a commit to the source repository, providing the output artifact (any files to be built) from the **Source** stage.
- 2. The output artifact (any files to be built) from the previous step is ingested as an input artifact to the **Build** stage. An output artifact (the built application) from the **Build** stage can be an updated application or an updated Docker image built to a container.
- 3. The output artifact from the previous step (the built application) is ingested as an input artifact to the **Deploy** stage, such as staging or production environments in the Amazon Web Services Cloud. You can deploy applications to a deployment fleet, or you can deploy container-based applications to tasks running in ECS clusters.

When you create or edit an action, you designate the input and output artifact or artifacts for the action. For example, for a two-stage pipeline with a **Source** and **Deploy** stage, in **Edit Action**, you choose the artifact name of the source action for the input artifact for the deploy action.

 When you use the console to create your first pipeline, CodePipeline creates an Amazon S3 bucket in the same Amazon Web Services account and Amazon Web Services Region to store items for all pipelines. Every time you use the console to create another pipeline in that Region, CodePipeline creates a folder for that pipeline in the bucket. It uses that folder to store artifacts for your pipeline as the automated release process runs. This bucket is named codepipeline-*region-12345EXAMPLE*, where *region* is the Amazon Region in which you created the pipeline, and *12345EXAMPLE* is a 12-digit random number that ensures the bucket name is unique.

🚯 Note

If you already have a bucket starting with codepipeline-*region*- in the Region where you are creating the pipeline, CodePipeline uses that as the default bucket. It also follows lexicographical order; for example, codepipeline-*region-abcexample* is chosen before codepipeline-*region-defexample*.

CodePipeline truncates artifact names, which can cause some bucket names to appear similar. Even though the artifact name appears to be truncated, CodePipeline maps to the artifact bucket in a way that is not affected by artifacts with truncated names. The pipeline can function normally. This is not an issue with the folder or artifacts. There is a 100-character limit to pipeline names. Although the artifact folder name might appear to be shortened, it is still unique for your pipeline.

When you create or edit a pipeline, you must have an artifact bucket in the pipeline Amazon Web Services account and Amazon Web Services Region, and you must have one artifact bucket per Region where you plan to execute an action. If you use the console to create a pipeline or cross-Region actions, default artifact buckets are configured by CodePipeline in the Regions where you have actions.

If you use the Amazon CLI to create a pipeline, you can store the artifacts for that pipeline in any Amazon S3 bucket as long as that bucket is in the same Amazon Web Services account and Amazon Web Services Region as the pipeline. You might do this if you are concerned about exceeding the limits of Amazon S3 buckets allowed for your account. If you use the Amazon CLI to create or edit a pipeline, and you add a cross-Region action (an action with an Amazon provider in a Region different from your pipeline), you must provide an artifact bucket for each additional Region where you plan to execute an action.

• Every action has a type. Depending on the type, the action might have one or both of the following:

- An input artifact, which is the artifact it consumes or works on over the course of the action run.
- An output artifact, which is the output of the action.

Every output artifact in the pipeline must have a unique name. Every input artifact for an action must match the output artifact of an action earlier in the pipeline, whether that action is immediately before the action in a stage or runs in a stage several stages earlier.

An artifact can be worked on by more than one action.

How do stage conditions work?

For each condition that specifies a rule, the rule is run. If the condition fails, the result is engaged. The stage performs the specified result only when the condition fails. Optionally, as part of the rule, you also specify which resources CodePipeline should use for certain cases. For example, the CloudWatchAlarm rule will use a CloudWatch alarm resource to run checks for the condition.

A condition might match multiple rules, and each rule can specify one of three providers.

The high-level flow for creating conditions as as follows.

- 1. Choose the type of condition from the available condition types in CodePipeline. For example, use an On Success condition type to set up a stage so that after the stage succeeds, a set of rules can be used to run checks before proceeding.
- 2. Choose the rule. For example, the CloudWatchAlarm rule will check for alarms and uses EB to check for a preconfigured alarm threshold. If the check is successful, and the alarm is below the threshold, the stage can proceed.
- 3. Configure the result, such as a rollback that would be used if the rule fails.

Conditions are used for specific types of expressions and each has specific options for results available as follows:

- Entry The conditions for making checks that, if met, allow entry to a stage. Rules are engaged with the following result options: Fail or Skip
- **On Failure** The conditions for making checks for the stage when it fails. Rules are engaged with the following result option: **Rollback**

• **On Success** - The conditions for making checks for the stage when it succeeds. Rules are engaged with the following result options: **Rollback** or **Fail**

The following diagram shows an example flow for the Entry condition type in CodePipeline. Conditions answer the question, What should happen if the condition is not met, meaning any rule fails? In the following flow, an Entry condition is configured with a LambdaInvoke rule and a CloudWatchAlarm rule. If the rule fails, then the configured result, such as Fail, is engaged.

Stage	configured for entry condition		
Condition: Entry Results: Block or Enter	Override	CWE	
Rule2 status: Failed (Error), Result: Block Rule2 status: Succeeded, Result: Enter Rule1 status: Failed (Alarm), Result: Block Rule2 status: Succeeded, Result: Enter			
Override results in Stage status: Enter			

The following diagram shows an example flow for the On Failure condition type in CodePipeline. Conditions answer the question, What should happen if the condition is met, meaning the rules all succeed their checks? In the following flow, an On Failure condition is configured with a LambdaInvoke rule and a CloudWatchAlarm rule. If the rule succeeds, then the configured result, such as Fail, is engaged.

Stage	configured for On Failure condition		
Condition: OnFailure Result: Rollback	Override		
Rule2 status: Failed (Error), Result: Rollback Rule2 status: Succeeded, Result: Fail stage			
S Rule1 status: Failed (Alarm), Result: Rollback			
Rule2 status: Succeeded, Result: Fail stage			
Override results in Stage status: Failed			

The following diagram shows an example flow for the On Success condition type in CodePipeline. Conditions answer the question, What should happen if the condition is met, meaning the rules all succeed their checks? In the following flow, an On Success condition is configured with a LambdaInvoke rule and a CloudWatchAlarm rule. If the rule succeeds, then the configured result, such as Fail, is engaged.

Stage configured for On Success condition				
Condition: Entry Results: Rollback or Fail	Override			
 Rule2 status: Failed (Error), Result: Rollback or Fail Rule2 status: Succeeded, Result: Proceed Rule1 status: Failed (Alarm), Result: Rollback or Fail Rule2 status: Succeeded, Result: Proceed 				
Override results in Stage status: Proceed				

Stage configured for On Success condition

Rules for stage conditions

When you configure stage conditions, you select from pre-defined rules and specify the results for the rule. A condition state will be Failed if any of the rules in the condition are failed and Succeeded if all the rules succeed. How criteria are met for conditions for On Failure and On Success depends on the type of rule.

The following are managed rules that you can add to stage conditions.

- Conditions can use the **Commands** rule to specify commands to meet the rule criteria for conditions. For more information about this rule, see Commands.
- Conditions can use the Amazon DeploymentWindow rule to specify approved deployment times for allowing a deployment. The criteria for the rule will be measured with a provided cron expression for a deployment window. The rule succeeds when the date and time in the deployment window meet the criteria in the cron expression for the rule. For more information about this rule, see DeploymentWindow.
- Conditions can use the **Amazon Lambda** rule to check for error states returned from configured Lambda functions. The rule is met when the check receives the Lambda function result. An error

from the Lambda function meets the criteria for On Failure conditions. For more information about this rule, see LambdaInvoke.

- Conditions can use the Amazon CloudWatchAlarm rule to check for alarms configured from CloudWatch events. The rule is met when the check returns an alarm state of OK, ALARM, or INSUFF_DATA. For On Success conditions, OK and INSUFFICIENT_DATA meet the criteria. ALARM meets the criteria for On Failure conditions. For more information about this rule, see <u>CloudWatchAlarm</u>.
- Conditions can use the VariableCheck rule to create a condition where the output variable is checked against a provided expression. The rule passes the check when the variable value meets the rule criteria, such as the value being equal or greater than a specified output variable. For more information about this rule, see <u>VariableCheck</u>.

Pipeline types

CodePipeline provides the following pipeline types, which differ in characteristics and price, so that you can tailor your pipeline features and cost to the needs of your applications.

- V1 type pipelines have a JSON structure that contains standard pipeline, stage, and action-level parameters.
- V2 type pipelines have the same structure as a V1 type, along with additional parameters for release safety and trigger configuration.

For information about pricing for CodePipeline, see Pricing.

See the <u>CodePipeline pipeline structure reference</u> page for details about parameters in each pipeline type. For information about which type of pipeline to choose, see <u>What type of pipeline is</u> right for me?.

What type of pipeline is right for me?

The pipeline type is determined by the set of characteristics and features supported by each pipeline version.

The following is a summary of the use cases and characteristics available for each type of pipeline.

	V1 type	V2 type
Characteristics		
Use cases	Standard deployments	 Deployments with configuration from passing pipeline-level variables at runtime Deployments where pipelines are configured to start on Git tags
Action-level variables	Supported	Supported
PARALLEL execution mode	Not supported	Supported
Pipeline-level variables	Not supported	Supported
QUEUED execution mode	Not supported	Supported
Rollback for pipeline stages	Not supported	Supported
Source revision overrides	Not supported	Supported
Stage conditions	Not supported	Supported
<u>Triggers and filtering Git tags,</u> pull requests, branches, or file paths	Not supported	Supported
The Commands action	Not supported	Supported
<u>Creating Entry conditions</u> with Skip result	Not supported	Supported
Configure a stage for automatic retry on failure	Not supported	Supported

For information about pricing for CodePipeline, see Pricing.

You can create and run a Python script to help you analyze the potential cost of moving a V1 type pipeline to a V2 type pipeline.

🚯 Note

The sample script below is intended for demonstration and evaluation purposes only. It is not a quote tool and does not guarantee the cost for your actual use of a V2 type pipeline, and it does not include any taxes that might apply. For information about pricing for CodePipeline, see <u>Pricing</u>.

To create and run a script to help you evaluate the cost of moving a V1 type pipeline to a V2 type pipeline

- 1. Download and install python.
- 2. Open a terminal window. Run the following command to create a new python script named **PipelineCostAnalyzer.py**.

vi PipelineCostAnalyzer.py

3. Copy and paste the following code into the **PipelineCostAnalyzer.py** script.

```
import boto3
import sys
import math
from datetime import datetime, timedelta, timezone
if len(sys.argv) < 3:
    raise Exception("Please provide region name and pipeline name as arguments.
Example usage: python PipelineCostAnalyzer.py us-east-1 MyPipeline")
session = boto3.Session(profile_name='default', region_name=sys.argv[1])
pipeline = sys.argv[2]
codepipeline = session.client('codepipeline')
def analyze_cost_in_v2(pipeline_name):
    if codepipeline.get_pipeline(name=pipeline)['pipeline']['pipelineType'] ==
 'V2':
        raise Exception("Provided pipeline is already of type V2.")
    total_action_executions = 0
    total_blling_action_executions = 0
```

```
total_action_execution_minutes = 0
   cost = 0.0
   hasNextToken = True
   nextToken = ""
   while hasNextToken:
       if nextToken=="":
           response =
codepipeline.list_action_executions(pipelineName=pipeline_name)
       else:
           response =
codepipeline.list_action_executions(pipelineName=pipeline_name,
nextToken=nextToken)
       if 'nextToken' in response:
           nextToken = response['nextToken']
       else:
           hasNextToken= False
       for action_execution in response['actionExecutionDetails']:
           start_time = action_execution['startTime']
           end_time = action_execution['lastUpdateTime']
           if (start_time < (datetime.now(timezone.utc) - timedelta(days=30))):</pre>
               hasNextToken= False
               continue
           total_action_executions += 1
           if (action_execution['status'] in ['Succeeded', 'Failed', 'Stopped']):
               action_owner = action_execution['input']['actionTypeId']['owner']
               action_category = action_execution['input']['actionTypeId']
['category']
               if (action_owner == 'Custom' or (action_owner == 'AWS' and
action_category == 'Approval')):
                   continue
               total_blling_action_executions += 1
               action_execution_minutes = (end_time -
start_time).total_seconds()/60
               action_execution_cost = math.ceil(action_execution_minutes) * 0.002
               total_action_execution_minutes += action_execution_minutes
               cost = round(cost + action_execution_cost, 2)
   print ("{:<40}".format('Activity in last 30 days:'))</pre>
   ___'))
   print ("| {:<40} | {:<10}".format('Total action executions:',</pre>
total_action_executions))
```

```
print ("| {:<40} | {:<10}".format('Total billing action executions:',
total_blling_action_executions))
    print ("| {:<40} | {:<10}".format('Total billing action execution minutes:',
round(total_action_execution_minutes, 2)))
    print ("| {:<40} | {:<10}".format('Cost of moving to V2 in $:', cost - 1))
analyze_cost_in_v2(pipeline)
```

4. From the terminal or command prompt, change directories to where you created the analyzer script.

From that directory, run the following command, where *region* is the Amazon Web Services Region where you created the V1 pipelines you want to analyze. You can also optionally evaluate a specific pipeline by providing its name:

python3 PipelineCostAnalyzer.py region --pipelineName

For example, run the following command to run the python script named **PipelineCostAnalyzer.py**. In this example, the Region is us-west-2.

python3 PipelineCostAnalyzer.py us-west-2

Note

This script will analyze all V1 pipelines in the specified Amazon Web Services Region unless you specify a specific pipeline name.

5. In the following sample output from the script, we can see the list of action executions, the list of action executions that were eligible for billing, the total runtime of these action executions, and the estimated cost of these actions as performed in a V2 pipeline.

 In this example, the negative value in the last row represents the estimated amount that might be saved by moving to V2 type pipelines.

Note

The script output and related examples that show costs and other information are estimates only. They are intended for demonstration and evaluation purposes only and do not guarantee any actual savings. For information about pricing for CodePipeline, see <u>Pricing</u>.

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Getting started with CodePipeline

If you are new to CodePipeline, you can follow the tutorials in this guide after following the steps in this chapter to get set up.

The CodePipeline console includes helpful information in a collapsible panel that you can open from the information icon or any **Info** link on the page.



You can close this panel at any time.

The CodePipeline console also provides a way to quickly search for your resources, such as repositories, build projects, deployment applications, and pipelines. Choose **Go to resource** or press the / key, and then type the name of the resource. Any matches appear in the list. Searches are case insensitive. You only see resources that you have permissions to view. For more information, see <u>Viewing resources in the console</u>.

Before you can use Amazon CodePipeline for the first time, you must create your Amazon Web Services account and create your first administrative user.

Topics

- Step 1: Create an Amazon Web Services account and administrative user
- Step 2: Apply a managed policy for administrative access to CodePipeline
- Step 3: Install the Amazon CLI
- Step 4: Open the console for CodePipeline
- Next steps

Step 1: Create an Amazon Web Services account and administrative user

Sign up for an Amazon Web Services account

If you do not have an Amazon Web Services account, use the following procedure to create one.

- 1. Open http://www.amazonaws.cn/ and choose Sign Up.
- 2. Follow the on-screen instructions.

Amazon sends you a confirmation email after the sign-up process is complete. At any time, you can view your current account activity and manage your account by going to <u>http://</u><u>www.amazonaws.cn/</u> and choosing **My Account**.

Secure IAM users

After you sign up for an Amazon Web Services account, safeguard your administrative user by turning on multi-factor authentication (MFA). For instructions, see <u>Enable a virtual MFA device for</u> an IAM user (console) in the *IAM User Guide*.

To give other users access to your Amazon Web Services account resources, create IAM users. To secure your IAM users, turn on MFA and only give the IAM users the permissions needed to perform their tasks.

For more information about creating and securing IAM users, see the following topics in the *IAM User Guide*:

- Creating an IAM user in your Amazon Web Services account
- Access management for Amazon resources
- Example IAM identity-based policies

Step 2: Apply a managed policy for administrative access to CodePipeline

You must grant permissions to interact with CodePipeline. The quickest way to do this is to apply the AWSCodePipeline_FullAccess managed policy to the administrative user.

🚺 Note

The AWSCodePipeline_FullAccess policy includes permissions that allow the console user to pass an IAM role to CodePipeline or other Amazon Web Services services. This allows the service to assume the role and perform actions on your behalf. When you attach the policy to a user, role, or group, the iam: PassRole permissions are applied. Make sure the policy is only applied to trusted users. When users with these permissions use the console to create or edit a pipeline, the following choices are available:

- Create a CodePipeline service role or choose an existing one and pass the role to CodePipeline
- Might choose to create a CloudWatch Events rule for change detection and pass the CloudWatch Events service role to CloudWatch Events

For more information, see <u>Granting a user permissions to pass a role to an Amazon Web</u> Services service.

1 Note

The AWSCodePipeline_FullAccess policy provides access to all CodePipeline actions and resources that the IAM user has access to, as well as all possible actions when creating stages in a pipeline, such as creating stages that include CodeDeploy, Elastic Beanstalk, or Amazon S3. As a best practice, you should grant individuals only the permissions they need to perform their duties. For more information about how to restrict IAM users to a limited set of CodePipeline actions and resources, see <u>Remove permissions from the CodePipeline</u> <u>service role</u>.

To provide access, add permissions to your users, groups, or roles:

• Users managed in IAM through an identity provider:

Create a role for identity federation. Follow the instructions in <u>Create a role for a third-party</u> identity provider (federation) in the *IAM User Guide*.

- IAM users:
 - Create a role that your user can assume. Follow the instructions in <u>Create a role for an IAM user</u> in the *IAM User Guide*.
 - (Not recommended) Attach a policy directly to a user or add a user to a user group. Follow the instructions in Adding permissions to a user (console) in the *IAM User Guide*.

Step 3: Install the Amazon CLI

To call CodePipeline commands from the Amazon CLI on a local development machine, you must install the Amazon CLI. This step is optional if you intend to get started using only the steps in this guide for the CodePipeline console.

To install and configure the Amazon CLI

1. On your local machine, download and install the Amazon CLI. This will enable you to interact with CodePipeline from the command line. For more information, see <u>Getting Set Up with the</u> Amazon Command Line Interface.

1 Note

CodePipeline works only with Amazon CLI versions 1.7.38 and later. To determine which version of the Amazon CLI that you may have installed, run the command **aws** --version. To upgrade an older version of the Amazon CLI to the latest version, follow the instructions in <u>Uninstalling the Amazon CLI</u>, and then follow the instructions in <u>Installing the Amazon Command Line Interface</u>.

2. Configure the Amazon CLI with the **configure** command, as follows:

```
aws configure
```

When prompted, specify the Amazon access key and Amazon secret access key of the IAM user that you will use with CodePipeline. When prompted for the default region name, specify the region where you will create the pipeline, such as us-east-2. When prompted for the default output format, specify j son. For example:

```
AWS Access Key ID [None]: Type your target Amazon access key ID here, and then
press Enter
AWS Secret Access Key [None]: Type your target Amazon secret access key here, and
then press Enter
Default region name [None]: Type us-east-2 here, and then press Enter
Default output format [None]: Type json here, and then press Enter
```

🚯 Note

For more information about IAM, access keys, and secret keys, see <u>Managing Access</u> <u>Keys for IAM Users</u> and <u>How Do I Get Credentials</u>?.

For more information about the Regions and endpoints available for CodePipeline, see Amazon CodePipeline endpoints and quotas.

Step 4: Open the console for CodePipeline

• Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

Next steps

You have completed the prerequisites. You can begin using CodePipeline. To start working with CodePipeline, see the <u>CodePipeline tutorials</u>.

Product and service integrations with CodePipeline

By default, Amazon CodePipeline is integrated with a number of Amazon Web Services services and partner products and services. Use the information in the following sections to help you configure CodePipeline to integrate with the products and services you use.

The following related resources can help you as you work with this service.

Topics

- Integrations with CodePipeline action types
- General integrations with CodePipeline
- Examples from the community

Integrations with CodePipeline action types

The integrations information in this topic is organized by CodePipeline action type.

Topics

- Source action integrations
- Build action integrations
- <u>Test action integrations</u>
- Deploy action integrations
- Approval action integration with Amazon Simple Notification Service
- Invoke action integrations

Source action integrations

The following information is organized by CodePipeline action type and can help you configure CodePipeline to integrate with the following source action providers.

Topics

- Amazon ECR source actions
- Amazon S3 source actions

- <u>Connections to Bitbucket Cloud, GitHub (via GitHub App), GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed
- CodeCommit source actions
- GitHub (via OAuth app) source actions

Amazon ECR source actions

<u>Amazon ECR</u> is an Amazon Docker image repository service. You use Docker push and pull commands to upload Docker images to your repository. An Amazon ECR repository URI and image are used in Amazon ECS task definitions to reference source image information.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>Amazon ECR source</u> <u>action reference</u>
- Create a pipeline, stages, and actions
- Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment

Amazon S3 source actions

<u>Amazon S3</u> is storage for the internet. You can use Amazon S3 to store and retrieve any amount of data at any time, from anywhere on the web. You can configure CodePipeline to use a versioned Amazon S3 bucket as the source action for your code.

🚯 Note

Amazon S3 can also be included in a pipeline as a deploy action.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>Amazon S3 source</u> action reference
- Step 1: Create an S3 source bucket for your application
- Create a pipeline (CLI)
- CodePipeline uses Amazon EventBridge (previously Amazon CloudWatch Events) to detect changes in your Amazon S3 source bucket. See General integrations with CodePipeline.

Connections to Bitbucket Cloud, GitHub (via GitHub App), GitHub Enterprise Server, GitLab.com, and GitLab self-managed

Connections (CodeStarSourceConnection actions) are used to access your third-party Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com, or GitLab self-managed repository.

Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Bitbucket Cloud You can configure CodePipeline to use a Bitbucket Cloud repository as the source for your code. You must have previously created a Bitbucket account and at least one Bitbucket Cloud repository. You can add a source action for your Bitbucket Cloud repository by either creating a pipeline or editing an existing one.

🚯 Note

You can create connections to a Bitbucket Cloud repository. Installed Bitbucket provider types, such as Bitbucket Server, are not supported

You can set up resources called *connections* to allow your pipelines to access third-party code repositories. When you create a connection, you install the connector app with your third-party code repository, and then associate it with your connection.

For Bitbucket Cloud, use the **Bitbucket** option in the console or the CodestarSourceConnection action in the CLI. See <u>Bitbucket Cloud</u> <u>connections</u>.

You can use the **Full clone** option for this action to reference the repositor y Git metadata so that downstream actions can perform Git commands directly. This option can only be used by CodeBuild downstream actions.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub</u> <u>Enterprise Server, GitLab.com, and GitLab self-managed actions.</u>
- To view a Getting Started tutorial that creates a pipeline with a Bitbucket Cloud source, see Getting started with connections.

GitHubYou can configure CodePipeline to use a GitHub repository as the sourceor GitHubfor your code. You must have previously created a GitHub account and atEnterpriseleast one GitHub repository. You can add a source action for your GitHubCloudrepository by either creating a pipeline or editing an existing one.

You can set up resources called *connections* to allow your pipelines to access third-party code repositories. When you create a connection, you install the connector app with your third-party code repository, and then associate it with your connection.

Use the **GitHub (via GitHub App)** provider option in the console or the CodestarSourceConnection action in the CLI. See <u>GitHub connectio</u> <u>ns</u>.

You can use the **Full clone** option for this action to reference the repositor y Git metadata so that downstream actions can perform Git commands directly. This option can only be used by CodeBuild downstream actions.

- To view configuration parameters and an example JSON/YAML snippet, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub</u> Enterprise Server, GitLab.com, and GitLab self-managed actions
- For a tutorial that shows you how to connect to a GitHub repository and use the Full clone option, see <u>Tutorial</u>: Use full clone with a GitHub pipeline source.
- The current GitHub (via GitHub App) action is the version 2 source action for GitHub. The GitHub (via OAuth app) action is the version 1 GitHub action managed with OAuth token authentication. While we don't

recommend using the GitHub (via OAuth app) action, existing pipelines with the GitHub (via OAuth app) action will continue to work without any impact. You can now use a <u>CodeStarSourceConnection for Bitbucket</u> <u>Cloud, GitHub, GitHub Enterprise Server, GitLab.com, and GitLab self-</u> <u>managed actions</u> source action in your pipeline that manages your GitHub source action with GitHub apps. If you have a pipeline that uses the GitHub (via OAuth app) action, see the steps to update it to use a GitHub (via GitHub App) action in <u>Update a GitHub (via OAuth app) source action</u> to a GitHub (via GitHub App) source action.

GitHub Enterprise Server

You can configure CodePipeline to use a GitHub Enterprise Server repositor y as the source for your code. You must have previously created a GitHub account and at least one GitHub repository. You can add a source action for your GitHub Enterprise Server repository by either creating a pipeline or editing an existing one.

You can set up resources called *connections* to allow your pipelines to access third-party code repositories. When you create a connection, you install the connector app with your third-party code repository, and then associate it with your connection.

Use the **GitHub Enterprise Server** provider option in the console or the CodestarSourceConnection action in the CLI. See <u>GitHub Enterprise</u> <u>Server connections</u>.

You can use the **Full clone** option for this action to reference the repositor y Git metadata so that downstream actions can perform Git commands directly. This option can only be used by CodeBuild downstream actions.

Learn more:

 To view configuration parameters and an example JSON/YAML snippet, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub</u> <u>Enterprise Server, GitLab.com, and GitLab self-managed actions</u>

- For a tutorial that shows you how to connect to a GitHub repository and use the **Full clone** option, see <u>Tutorial: Use full clone with a GitHub</u> pipeline source.
- GitLab.com You can configure CodePipeline to use a GitLab.com repository as the source for your code. You must have previously created a GitLab.com account and at least one GitLab.com repository. You can add a source action for your GitLab.com repository by either creating a pipeline or editing an existing one.

Use the **GitLab** provider option in the console or the CodestarS ourceConnection action with the GitLab provider in the CLI. See <u>GitLab.com connections</u>.

Learn more:

 To view configuration parameters and an example JSON/YAML snippet, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub</u> <u>Enterprise Server, GitLab.com, and GitLab self-managed actions</u>

GitLab self-
managedYou can configure CodePipeline to use a GitLab self-managed installation as
the source for your code. You must have previously created a GitLab account
and have a subscription for self-managed GitLab (Enterprise Edition or
Community Edition). You can add a source action for your GitLab self-mana
ged repository by either creating a pipeline or editing an existing one.

You can set up resources called *connections* to allow your pipelines to access third-party code repositories. When you create a connection, you install the connector app with your third-party code repository, and then associate it with your connection.

Use the **GitLab self-managed** provider option in the console or the CodestarSourceConnection action in the CLI. See <u>Connections for</u> <u>GitLab self-managed</u>.

You can use the **Full clone** option for this action to reference the repositor y Git metadata so that downstream actions can perform Git commands directly. This option can only be used by CodeBuild downstream actions.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub</u> Enterprise Server, GitLab.com, and GitLab self-managed actions
- For the steps to create a connection with this provider type, see <u>Connectio</u> ns for GitLab self-managed.

CodeCommit source actions

<u>CodeCommit</u> is a version control service that you can use to privately store and manage assets (such as documents, source code, and binary files) in the cloud. You can configure CodePipeline to use a branch in a CodeCommit repository as the source for your code. Create the repository and associate it with a working directory on your local machine. Then you can create a pipeline that uses the branch as part of a source action in a stage. You can connect to the CodeCommit repository by either creating a pipeline or editing an existing one.

You can use the **Full clone** option for this action to reference the repository Git metadata so that downstream actions can perform Git commands directly. This option can only be used by CodeBuild downstream actions.

- To view configuration parameters and an example JSON/YAML snippet, see <u>CodeCommit source</u> action reference.
- Tutorial: Create a simple pipeline (CodeCommit repository)
- CodePipeline uses Amazon CloudWatch Events to detect changes in CodeCommit repositories used as a source for a pipeline. Each source action has a corresponding event rule. This event rule starts your pipeline when a change occurs in the repository. See <u>General integrations with</u> CodePipeline.

GitHub (via OAuth app) source actions

The GitHub (via OAuth app) action is the version 1 GitHub action managed with OAuth Apps. In available Regions, you can also use a <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub,</u> <u>GitHub Enterprise Server, GitLab.com, and GitLab self-managed actions</u> source action in your pipeline that manages your GitHub source action with GitHub Apps. If you have a pipeline that uses the GitHub (via OAuth app) action, see the steps to update it to use a GitHub (via GitHub app) action in <u>Update a GitHub (via OAuth app) source action to a GitHub (via GitHub App) source action</u>.

Note: The CodePipeline action for GitHub (via OAuth app) is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

🚯 Note

While we don't recommend using the GitHub (via OAuth app) action, existing pipelines with the GitHub (via OAuth app) action will continue to work without any impact.

Learn more:

- For more information about OAuth-based GitHub (via OAuth app) access in contrast to appbased GitHub access, see <u>https://docs.github.com/en/developers/apps/differences-between-</u> github-apps-and-oauth-apps.
- To view an appendix that contains the GitHub (via OAuth app) action details, see <u>Appendix A:</u> <u>GitHub (via OAuth app) source actions.</u>

Build action integrations

The following information is organized by CodePipeline action type and can help you configure CodePipeline to integrate with the following build action providers.

Topics

- CodeBuild build actions
- <u>CloudBees build actions</u>
- Amazon ECR build and publish actions

- Jenkins build actions
- TeamCity build actions

CodeBuild build actions

<u>CodeBuild</u> is a fully managed build service that compiles your source code, runs unit tests, and produces artifacts that are ready to deploy.

You can add CodeBuild as a build action to the build stage of a pipeline. For more information, see the CodePipeline Action Configuration Reference for <u>Amazon CodeBuild build and test action</u> reference.

Note

CodeBuild can also be included in a pipeline as a test action, with or without a build output.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>Amazon CodeBuild</u> build and test action reference.
- What Is CodeBuild?
- CodeBuild Fully Managed Build Service

CloudBees build actions

You can configure CodePipeline to use <u>CloudBees</u> to build or test your code in one or more actions in a pipeline.

Learn more:

re:INVENT 2017: Cloud First with Amazon

Amazon ECR build and publish actions

<u>Amazon ECR</u> is an Amazon Docker image repository service. You use Docker push and pull commands to upload Docker images to your repository.

You can add the ECRBuildAndPublish action to your pipeline to automate building and pushing an image. For more information, see the CodePipeline Action configuration reference for ECRBuildAndPublish build action reference.

Jenkins build actions

You can configure CodePipeline to use <u>Jenkins CI</u> to build or test your code in one or more actions in a pipeline. You must have previously created a Jenkins project and installed and configured the CodePipeline Plugin for Jenkins for that project. You can connect to the Jenkins project by either creating a new pipeline or editing an existing one.

Access for **Jenkins** is configured on a per-project basis. You must install the CodePipeline Plugin for Jenkins on every Jenkins instance you want to use with CodePipeline. You must also configure CodePipeline access to the Jenkins project. Secure your Jenkins project by configuring it to accept HTTPS/SSL connections only. If your Jenkins project is installed on an Amazon EC2 instance, consider providing your Amazon credentials by installing the Amazon CLI on each instance. Then configure an Amazon profile on those instances with the credentials you want to use for connections. This is an alternative to adding and storing them through the Jenkins web interface.

Learn more:

- Accessing Jenkins
- Tutorial: Create a four-stage pipeline

TeamCity build actions

You can configure CodePipeline to use <u>TeamCity</u> to build and test your code in one or more actions in a pipeline.

Learn more:

• TeamCity Plugin for CodePipeline

Test action integrations

The following information is organized by CodePipeline action type and can help you configure CodePipeline to integrate with the following test action providers.

Topics

Test action integrations

- CodeBuild test actions
- Amazon Device Farm test actions
- Ghost Inspector test actions
- OpenText LoadRunner Cloud test actions
- Reflect test automation

CodeBuild test actions

<u>CodeBuild</u> is a fully managed build service in the cloud. CodeBuild compiles your source code, runs unit tests, and produces artifacts that are ready to deploy.

You can add CodeBuild to a pipeline as a test action. For more information, see the CodePipeline Action Configuration Reference for Amazon CodeBuild build and test action reference.

🚯 Note

CodeBuild can also be included in a pipeline as a build action, with a mandatory build output artifact.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>Amazon CodeBuild</u> <u>build and test action reference</u>.
- What Is CodeBuild?

Amazon Device Farm test actions

<u>Amazon Device Farm</u> is an app testing service that you can use to test and interact with your Android, iOS, and web applications on real, physical phones and tablets. You can configure CodePipeline to use Amazon Device Farm to test your code in one or more actions in a pipeline. Amazon Device Farm allows you to upload your own tests or use built-in, script-free compatibility tests. Because testing is performed in parallel, tests on multiple devices begin in minutes. A test report that contains high-level results, low-level logs, pixel-to-pixel screenshots, and performance data is updated as tests are completed. Amazon Device Farm supports testing of native and hybrid Android, iOS, and Fire OS apps, including those created with PhoneGap, Titanium, Xamarin, Unity, and other frameworks. It supports remote access of Android apps, which allows you to interact directly with test devices.

Learn more:

- To view configuration parameters and an example JSON/YAML snippet, see <u>Amazon Device Farm</u> test action reference.
- What Is Amazon Device Farm?
- Using Amazon Device Farm in a CodePipeline Test Stage

Note: The CodePipeline action for Device Farm is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with</u> CodePipeline.

Ghost Inspector test actions

You can configure CodePipeline to use <u>Ghost Inspector</u> to test your code in one or more actions in a pipeline.

Learn more:

• Ghost Inspector documentation for service integration with CodePipeline

OpenText LoadRunner Cloud test actions

You can configure CodePipeline to use <u>OpenText LoadRunner Cloud</u> in one or more actions in a pipeline.

Learn more:

• LoadRunner Cloud documentation for integrating with CodePipeline

Reflect test automation

<u>Reflect</u> is the AI-powered test automation solution that empowers you to simplify testing and overcome the challenges of manual processes. With no-code test automation, Reflect streamlines test creation, execution, and maintenance, enabling you to create robust, repeatable tests without requiring any technical knowledge. By eliminating complexity and ensuring minimal disruption to

your workflows, it helps you accelerate testing and confidently deliver high-quality applications every time.

Learn more:

Amazon CodePipeline test integration with Reflect

Deploy action integrations

The following information is organized by CodePipeline action type and can help you configure CodePipeline to integrate with the following deploy action providers.

Topics

- Amazon EC2 deploy actions
- Amazon Elastic Kubernetes Service EKS deploy actions
- Amazon S3 deploy actions
- <u>Amazon AppConfig deploy actions</u>
- Amazon CloudFormation deploy actions
- <u>Amazon CloudFormation StackSets deploy actions</u>
- Amazon ECS deploy actions
- Elastic Beanstalk deploy actions
- Amazon OpsWorks deploy actions
- Service Catalog deploy actions
- Amazon Alexa deploy actions
- CodeDeploy deploy actions
- XebiaLabs deploy actions

Amazon EC2 deploy actions

<u>Amazon EC2</u> allows you to create and manage compute in the cloud. You can add an action to a pipeline that uses Amazon EC2 as a deployment provider that deploys your application to your instances.

Deploy action integrations

- See the action reference page at Amazon EC2 action reference.
- For a tutorial, see Tutorial: Deploy to Amazon EC2 instances with CodePipeline.

Amazon Elastic Kubernetes Service EKS deploy actions

<u>Amazon EKS</u> allows you to create and manage kubernetes clusters. You can add an action to a pipeline that uses Amazon EKS as a deployment provider that deploys your image to your cluster. You can use helm templates or kubernetes manifest files.

Learn more:

- See the action reference page at Amazon Elastic Kubernetes Service EKS deploy action reference.
- For a tutorial, see Tutorial: Deploy to Amazon EKS with CodePipeline.

Amazon S3 deploy actions

<u>Amazon S3</u> is storage for the internet. You can use Amazon S3 to store and retrieve any amount of data at any time, from anywhere on the web. You can add an action to a pipeline that uses Amazon S3 as a deployment provider.

Note

Amazon S3 can also be included in a pipeline as a source action.

Learn more:

- Create a pipeline, stages, and actions
- Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider

Amazon AppConfig deploy actions

Amazon AppConfig is a capability of Amazon Systems Manager to create, manage, and quickly deploy application configurations. You can use AppConfig with applications hosted on EC2 instances, Amazon Lambda, containers, mobile applications, or IoT devices.

- CodePipeline Action Configuration Reference for <u>Amazon AppConfig deploy action reference</u>
- Tutorial: Create a pipeline that uses Amazon AppConfig as a deployment provider

Amazon CloudFormation deploy actions

<u>Amazon CloudFormation</u> gives developers and systems administrators an easy way to create and manage a collection of related Amazon resources, using templates to provision and update those resources. You can use the service's sample templates or create your own. Templates describe the Amazon resources and any dependencies or runtime parameters required to run your application.

Note: The CodePipeline action for Amazon CloudFormation is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service</u> integrations with CodePipeline.

The Amazon Serverless Application Model (Amazon SAM) extends Amazon CloudFormation to provide a simplified way to define and deploy serverless applications. Amazon SAM supports Amazon API Gateway APIs, Amazon Lambda functions, and Amazon DynamoDB tables. You can use CodePipeline with Amazon CloudFormation and the Amazon SAM to continuously deliver your serverless applications.

You can add an action to a pipeline that uses Amazon CloudFormation as a deployment provider. When you use Amazon CloudFormation as a deployment provider, you can take action on Amazon CloudFormation stacks and change sets as part of a pipeline execution. Amazon CloudFormation can create, update, replace, and delete stacks and change sets when a pipeline runs. As a result, Amazon and custom resources can be created, provisioned, updated, or terminated during a pipeline execution according to the specifications you provide in Amazon CloudFormation templates and parameter definitions.

- CodePipeline Action Configuration Reference for <u>Amazon CloudFormation deploy action</u> <u>reference</u>
- <u>Continuous Delivery with CodePipeline</u> Learn how to use CodePipeline to build a continuous delivery workflow for Amazon CloudFormation.
- <u>Automating Deployment of Lambda-based Applications</u> Learn how to use the Amazon Serverless Application Model and Amazon CloudFormation to build a continuous delivery workflow for your Lambda-based application.

Amazon CloudFormation StackSets deploy actions

<u>Amazon CloudFormation</u> gives you a way to deploy resources across multiple accounts and Amazon Regions.

The CodePipeline action for Step Functions is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with</u> CodePipeline.

You can use CodePipeline with Amazon CloudFormation to update your stack set definition and deploy updates to your instances.

You can add the following actions to a pipeline to use Amazon CloudFormation StackSets as a deployment provider.

- CloudFormationStackSet
- CloudFormationStackInstances

Learn more:

- CodePipeline Action Configuration Reference for <u>Amazon CloudFormation StackSets deploy</u> action reference
- Tutorial: Create a pipeline with Amazon CloudFormation StackSets deployment actions

Amazon ECS deploy actions

Amazon ECS is a highly scalable, high performance container management service that allows you to run container-based applications in the Amazon Web Services Cloud. When you create a pipeline, you can select Amazon ECS as a deployment provider. A change to code in your source control repository triggers your pipeline to build a new Docker image, push it to your container registry, and then deploy the updated image to Amazon ECS. You can also use the **ECS** (**Blue/Green**) provider action in CodePipeline to route and deploy traffic to Amazon ECS with CodeDeploy.

- What Is Amazon ECS?
- Tutorial: Continuous Deployment with CodePipeline

- Create a pipeline, stages, and actions
- Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment

Elastic Beanstalk deploy actions

<u>Elastic Beanstalk</u> is a service for deploying and scaling web applications and services developed with Java, .NET, PHP, Node.js, Python, Ruby, Go, and Docker on familiar servers such as Apache, Nginx, Passenger, and IIS. You can configure CodePipeline to use Elastic Beanstalk to deploy your code. You can create the Elastic Beanstalk application and environment to use in a deploy action in a stage either before you create the pipeline or when you use the **Create Pipeline** wizard.

🚯 Note

Learn more:

- Getting started using Elastic Beanstalk
- <u>Create a pipeline, stages, and actions</u>

Amazon OpsWorks deploy actions

Amazon OpsWorks is a configuration management service that helps you configure and operate applications of all shapes and sizes using Chef. Using Amazon OpsWorks Stacks, you can define the application's architecture and the specification of each component including package installation, software configuration and resources such as storage. You can configure CodePipeline to use Amazon OpsWorks Stacks to deploy your code in conjunction with custom Chef cookbooks and applications in Amazon OpsWorks.

- **Custom Chef Cookbooks** Amazon OpsWorks uses Chef Cookbooks to handle tasks such as installing and configuring packages and deploying applications.
- **Applications** An Amazon OpsWorks applications consists of code that you want to run on an application server. The application code is stored in a repository, such as an Amazon S3 bucket.

Before you create the pipeline, you create the Amazon OpsWorks stack and layer. You can create the Amazon OpsWorks application to use in a deploy action in a stage either before you create the pipeline or when you use the **Create Pipeline** wizard.

CodePipeline support for Amazon OpsWorks is currently available in the US East (N. Virginia) Region (us-east-1) only.

Learn more:

- Using CodePipeline with Amazon OpsWorks Stacks
- Cookbooks and Recipes
- <u>Amazon OpsWorks Apps</u>

Service Catalog deploy actions

<u>Service Catalog</u> enables organizations to create and manage catalogs of products that are approved for use on Amazon.

You can configure CodePipeline to deploy updates and versions of your product templates to Service Catalog. You can create the Service Catalog product to use in a deployment action and then use the **Create Pipeline** wizard to create the pipeline.

Learn more:

- Tutorial: Create a pipeline that deploys to Service Catalog
- Create a pipeline, stages, and actions

Amazon Alexa deploy actions

<u>Amazon Alexa Skills Kit</u> lets you build and distribute cloud-based skills to users of Alexa-enabled devices.

Note

This feature is not available in the Asia Pacific (Hong Kong) or Europe (Milan) Region. To use other deploy actions available in that Region, see <u>Deploy action integrations</u>.

You can add an action to a pipeline that uses Alexa Skills Kit as a deployment provider. Source changes are detected by your pipeline, and then your pipeline deploys updates to your Alexa skill in the Alexa service.

Learn more:

• Tutorial: Create a pipeline that deploys an Amazon Alexa skill

CodeDeploy deploy actions

<u>CodeDeploy</u> coordinates application deployments to Amazon EC2/on-premises instances, Amazon Elastic Container Service compute platforms, and serverless Amazon Lambda compute platforms. You can configure CodePipeline to use CodeDeploy to deploy your code. You can create the CodeDeploy application, deployment, and deployment group to use in a deploy action in a stage either before you create the pipeline or when you use the **Create Pipeline** wizard.

Learn more:

- Step 3: Create an application in CodeDeploy
- Tutorial: Create a simple pipeline (CodeCommit repository)

XebiaLabs deploy actions

You can configure CodePipeline to use <u>XebiaLabs</u> to deploy your code in one or more actions in a pipeline.

Learn more:

• Using XL Deploy with CodePipeline

Approval action integration with Amazon Simple Notification Service

<u>Amazon SNS</u> is a fast, flexible, fully managed push notification service that lets you send individual messages or to fan out messages to large numbers of recipients. Amazon SNS makes it simple and cost effective to send push notifications to mobile device users, email recipients or even send messages to other distributed services.

When you create a manual approval request in CodePipeline, you can optionally publish to a topic in Amazon SNS so that all IAM users subscribed to it are notified that the approval action is ready to be reviewed.

- What Is Amazon SNS?
- Grant Amazon SNS permissions to a CodePipeline service role

Invoke action integrations

The following information is organized by CodePipeline action type and can help you configure CodePipeline to integrate with the following invoke action providers.

Topics

- Amazon Inspector invoke actions
- Lambda invoke actions
- Step Functions invoke actions

Amazon Inspector invoke actions

<u>Amazon Inspector</u> is a vulnerability management service that automatically discovers workloads and continually scans them for software vulnerabilities and unintended network exposure. Amazon Inspector supports multiple archive formats including tar and war, and Amazon Inspector supports binaries including Rust and Go binaries.

You can configure the CodePipeline InspectorScan action to automate scanning your source code or Amazon ECR image repository for vulnerabilities.

Learn more:

 CodePipeline action configuration reference for <u>Amazon Inspector InspectorScan invoke</u> <u>action reference</u>

Lambda invoke actions

Lambda lets you run code without provisioning or managing servers. You can configure CodePipeline to use Lambda functions to add flexibility and functionality to your pipelines. You can create the Lambda function to add as an action in a stage either before you create the pipeline or when you use the **Create Pipeline** wizard.

Learn more:

• CodePipeline Action configuration reference for Amazon Lambda invoke action reference

• Invoke an Amazon Lambda function in a pipeline in CodePipeline

Step Functions invoke actions

<u>Step Functions</u> lets you create and configure state machines. You can configure CodePipeline to use Step Functions invoke actions to trigger state machine executions.

The CodePipeline action for Step Functions is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with</u> <u>CodePipeline</u>.

Learn more:

- CodePipeline Action Configuration Reference for Amazon Step Functions invoke action reference
- Tutorial: Use an Amazon Step Functions invoke action in a pipeline

General integrations with CodePipeline

The following Amazon Web Services service integrations are not based on CodePipeline action types.

	Learn more:
	What Is Amazon CloudWatch?
i	<u>Amazon EventBridge</u> is a web service that detects changes in your Amazon Web Services services based on rules that you define and invokes an action in one or more specified Amazon Web Services services when a change occurs.
	 Start a pipeline execution automatically when something changes — You can configure CodePipeline as a target in rules set up in Amazon EventBridge. This sets up pipelines to start automatic ally when another service changes. Learn more:

	 What Is Amazon EventBridge? Start a pipeline in CodePipeline. CodeCommit source actions and EventBridge Receive notifications when a pipeline state changes — You can set up EventBridge rules to detect and react to changes in execution state for a pipeline, stage, or action. Learn more: Monitoring CodePipeline events Tutorial: Set up a CloudWatch Events rule to receive email notifications for pipeline state changes
Amazon Cloud9	Amazon Cloud9 is an online IDE, which you access through your web browser. The IDE offers a rich code editing experience with support for several programming languages and runtime debuggers, as well as a built-in terminal. In the background, an Amazon EC2 instance hosts an Amazon Cloud9 development environment. For more information, see the <u>Amazon Cloud9 User Guide</u> . Learn more: • <u>Setting up Amazon Cloud9</u>
Amazon CloudTrail	CloudTrail captures Amazon API calls and related events made by or on behalf of an Amazon account and delivers log files to an Amazon S3 bucket that you specify. You can configure CloudTrail to capture API calls from the CodePipeline console, CodePipeline commands from the Amazon CLI, and from the CodePipeline API. Learn more: • Logging CodePipeline API calls with Amazon CloudTrail
AWS CodeStar Notifications	You can set up <i>notifications</i> to make users aware of important changes, such as when a pipeline starts execution. For more informati on, see <u>Create a notification rule</u> .

User Guide

Amazon Key Management Service

<u>Amazon KMS</u> is a managed service that makes it easy for you to create and control the encryption keys used to encrypt your data. By default, CodePipeline uses Amazon KMS to encrypt artifacts for pipelines stored in Amazon S3 buckets.

Learn more:

- To create a pipeline that uses a source bucket, artifact bucket, and service role from one Amazon account and CodeDeploy resources from a different Amazon account, you must create a customer-managed KMS key, add the key to the pipeline, and set up account policies and roles to enable cross-account access. For more information, see <u>Create a pipeline in CodePipeline that uses</u> resources from another Amazon account.
- To create a pipeline from one Amazon account that deploys an Amazon CloudFormation stack to another Amazon account, you must create a customer-managed KMS key, add the key to the pipeline, and set up account policies and roles to deploy the stack to another Amazon account. For more information, see <u>How do I</u> <u>use CodePipeline to deploy an Amazon CloudFormation stack in a</u> different account?
- To configure server-side encryption for your pipeline's S3 artifact bucket, you can use the default Amazon managed KMS key or create a customer-managed KMS key and set up the bucket policy to use the encryption key. For more information, see <u>Configure</u> <u>server-side encryption for artifacts stored in Amazon S3 for</u> <u>CodePipeline</u>.

For an Amazon KMS key, you can use the key ID, the key ARN, or the alias ARN.

🚯 Note

Aliases are recognized only in the account that created the KMS key. For cross-account actions, you can only use the key ID or key ARN to identify the key. Cross-account actions

involve using the role from the other account (AccountB), so specifying the key ID will use the key from the other account (AccountB).

Examples from the community

The following sections provide links to blog posts, articles, and community-provided examples.

1 Note

These links are provided for informational purposes only, and should not be considered either a comprehensive list or an endorsement of the content of the examples. Amazon is not responsible for the content or accuracy of external content.

Topics

Integration examples: Blog posts

Integration examples: Blog posts

• Tracking the Amazon CodePipeline build status from the third-party Git repository

Learn how to set up resources that will display your pipeline and build action status in your thirdparty repository, making it easy for the developer to track status without switching context.

Published March 2021

• <u>Complete CI/CD with Amazon CodeCommit, Amazon CodeBuild, Amazon CodeDeploy, and</u> Amazon CodePipeline

Learn how to set up a pipeline that uses the CodeCommit, CodePipeline, CodeBuild, and CodeDeploy services to compile, build, and install a version-controlled Java application onto a set of Amazon EC2 Linux instances.

Published September 2020

• How to deploy from GitHub to Amazon EC2 with CodePipeline

Learn how to set up CodePipeline from scratch to deploy dev, test, and prod branches to separate deployment groups. Learn how to use and configure IAM roles, the CodeDeploy agent, and CodeDeploy, along with CodePipeline.

Published April 2020

• Testing and creating CI/CD pipelines for Amazon Step Functions

Learn how to set up resources that will coordinate your Step Functions state machine and your pipeline.

Published March 2020

• Implementing DevSecOps Using CodePipeline

Learn how to use a CI/CD pipeline in CodePipeline to automate preventive and detective security controls. This post covers how to use a pipeline to create a simple security group and perform security checks during the source, test, and production stages to improve the security posture of your Amazon accounts.

Published March 2017

• <u>Continuous Deployment to Amazon ECS Using CodePipeline, CodeBuild, Amazon ECR, and</u> Amazon CloudFormation

Learn how to create a continuous deployment pipeline to Amazon Elastic Container Service (Amazon ECS). Applications are delivered as Docker containers using CodePipeline, CodeBuild, Amazon ECR, and Amazon CloudFormation.

 Download a sample Amazon CloudFormation template and instructions for using it to create your own continuous deployment pipeline from the <u>ECS Reference Architecture: Continuous</u> <u>Deployment</u> repo on GitHub.

Published January 2017

Continuous Deployment for Serverless Applications

Learn how to use a collection of Amazon Web Services services to create a continuous deployment pipeline for your serverless applications. You'll use the Serverless Application Model (SAM) to define the application and its resources and CodePipeline to orchestrate your application deployment.

• <u>View a sample application</u> written in Go with the Gin framework and an API Gateway proxy shim.

Published December 2016

• Scaling DevOps Deployments with CodePipeline and Dynatrace

Learn how use Dynatrace monitoring solutions to scale pipelines in CodePipeline, automatically analyze test executions before code is committed, and maintain optimal lead times.

Published November 2016

• <u>Create a Pipeline for Amazon Elastic Beanstalk in CodePipeline Using Amazon CloudFormation</u> and CodeCommit

Learn how to implement continuous delivery in a CodePipeline pipeline for an application in Amazon Elastic Beanstalk. All Amazon resources are provisioned automatically through the use of an Amazon CloudFormation template. This walkthrough also incorporates CodeCommit and Amazon Identity and Access Management (IAM).

Published May 2016

<u>Automate CodeCommit and CodePipeline in Amazon CloudFormation</u>

Use Amazon CloudFormation to automate the provisioning of Amazon resources for a continuous delivery pipeline that uses CodeCommit, CodePipeline, CodeDeploy, and Amazon Identity and Access Management.

Published April 2016

• Create a Cross-Account Pipeline in Amazon CodePipeline

Learn how to automate the provisioning of cross-account access to pipelines in Amazon CodePipeline by using Amazon Identity and Access Management. Includes examples in an Amazon CloudFormation template.

Published March 2016

• Exploring ASP.NET Core Part 2: Continuous Delivery

Learn how to create a full continuous delivery system for an ASP.NET Core application using CodeDeploy and Amazon CodePipeline.

Published March 2016

• Create a Pipeline Using the Amazon CodePipeline Console

Learn how to use the Amazon CodePipeline console to create a two-stage pipeline in a walkthrough based on the Amazon CodePipeline Tutorial: Create a four-stage pipeline.

Published March 2016

• Mocking Amazon CodePipeline Pipelines with Amazon Lambda

Learn how to invoke a Lambda function that lets you visualize the actions and stages in a CodePipeline software delivery process as you design it, before the pipeline is operational. As you design your pipeline structure, you can use the Lambda function to test whether your pipeline will complete successfully.

Published February 2016

Running Amazon Lambda Functions in CodePipeline Using Amazon CloudFormation

Learn how to create an Amazon CloudFormation stack that provisions all the Amazon resources used in the user guide task Invoke an Amazon Lambda function in a pipeline in CodePipeline.

Published February 2016

<u>Provisioning Custom CodePipeline Actions in Amazon CloudFormation</u>

Learn how to use Amazon CloudFormation to provision custom actions in CodePipeline.

Published January 2016

• Provisioning CodePipeline with Amazon CloudFormation

Learn how to provision a basic continuous delivery pipeline in CodePipeline using Amazon CloudFormation.

Published December 2015

• Deploying from CodePipeline to Amazon OpsWorks Using a Custom Action and Amazon Lambda

Learn how to configure your pipeline and the Amazon Lambda function to deploy to Amazon OpsWorks using CodePipeline.

Published July 2015

User Guide

CodePipeline tutorials

After you complete the steps in <u>Getting started with CodePipeline</u>, you can try one of the Amazon CodePipeline tutorials in this user guide.

Topics

- Tutorial: Deploy to Amazon EC2 instances with CodePipeline
- Tutorial: Build and push a Docker image to Amazon ECR with CodePipeline (V2 type)
- Tutorial: Deploy to Amazon EKS with CodePipeline
- Tutorial: Create a pipeline that runs commands with compute (V2 type)
- Tutorial: Use Git tags to start your pipeline
- Tutorial: Filter on branch names for pull requests to start your pipeline (V2 type)
- Tutorial: Use pipeline-level variables
- Tutorial: Create a simple pipeline (S3 bucket)
- Tutorial: Create a simple pipeline (CodeCommit repository)
- Tutorial: Create a four-stage pipeline
- <u>Tutorial: Set up a CloudWatch Events rule to receive email notifications for pipeline state</u> changes
- Tutorial: Create a pipeline that builds and tests your Android app with Amazon Device Farm
- Tutorial: Create a pipeline that tests your iOS app with Amazon Device Farm
- Tutorial: Create a pipeline that deploys to Service Catalog
- Tutorial: Create a pipeline with Amazon CloudFormation
- Tutorial: Create a pipeline that uses variables from Amazon CloudFormation deployment actions
- Tutorial: Amazon ECS Standard Deployment with CodePipeline
- Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment
- Tutorial: Create a pipeline that deploys an Amazon Alexa skill
- Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider
- <u>Tutorial: Create a pipeline that publishes your serverless application to the Amazon Serverless</u> Application Repository
- Tutorial: Lambda function deployments with CodePipeline

- Tutorial: Using variables with Lambda invoke actions
- Tutorial: Use an Amazon Step Functions invoke action in a pipeline
- Tutorial: Create a pipeline that uses Amazon AppConfig as a deployment provider
- Tutorial: Use full clone with a GitHub pipeline source
- Tutorial: Use full clone with a CodeCommit pipeline source
- Tutorial: Create a pipeline with Amazon CloudFormation StackSets deployment actions
- Tutorial: Create a variable check rule for a pipeline as an entry condition

Tutorial: Deploy to Amazon EC2 instances with CodePipeline

This tutorial helps you to create a deploy action in CodePipeline that deploys your code to instances you have configured in Amazon EC2.

i Note

As part of creating a pipeline in the console, an S3 artifact bucket will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🚺 Note

The EC2 deploy action is only available for V2 type pipelines.

Prerequisites

There are a few resources that you must have in place before you can use this tutorial to create your CD pipeline. Here are the things you need to get started:

🚺 Note

All of these resources should be created within the same Amazon Region.

- A source control repository (this tutorial uses GitHub) where you will add a sample script.sh file.
- You must use an existing CodePipeline service role that has been updated with the permissions for this action. To update your service role, see <u>Service role policy permissions for the EC2 deploy</u> <u>action</u>.

After you have satisfied these prerequisites, you can proceed with the tutorial and create your CD pipeline.

Step 1: Create Amazon EC2 Linux instances

In this step, you create the Amazon EC2 instances where you will deploy a sample application. As part of this process, create an instance role in IAM, if you have not already created an instance role in the Region where you want to create resources.

To create an instance role

- 1. Open the IAM console at https://console.amazonaws.cn/iam/).
- 2. From the console dashboard, choose **Roles**.
- 3. Choose **Create role**.
- 4. Under Select type of trusted entity, select Amazon Web Services service. Under Choose a use case, select EC2. Under Select your use case, choose EC2. Choose Next: Permissions.
- Search for and select the policy named
 AWSSystemsManagerDefaultEC2InstanceManagementRoleeployAction.
- Search for and select the policy named AmazonSSMManagedInstanceCore. Choose Next: Tags.
- 7. Choose **Next: Review**. Enter a name for the role (for example, **EC2InstanceRole**).

i Note

Make a note of your role name for the next step. You choose this role when you are creating your instance.

🚯 Note

You will add permissions to this role to allow access to the S3 artifact bucket for your pipeline after pipeline creation.

Choose Create role.

To launch instances

- 1. Open the Amazon EC2 console at <u>https://console.amazonaws.cn/ec2/</u>.
- 2. From the side navigation, choose **Instances**, and select **Launch instances** from the top of the page.
- 3. In Name, enter MyInstances. This assigns the instance a tag Key of Name and a tag Value of MyInstances.
- 4. Under **Application and OS Images (Amazon Machine Image)**, locate the **Amazon Linux** AMI option with the Amazon logo, and make sure it is selected. (This AMI is described as the Amazon Linux 2 AMI (HVM) and is labeled "Free tier eligible".)
- 5. Under **Instance type**, choose the free tier eligible t2.micro type as the hardware configuration for your instance.
- 6. Under **Key pair (login)**, choose a key pair or create one.
- 7. Under **Network settings**, make sure the status is **Enable**.
- 8. Expand **Advanced details**. In **IAM instance profile**, choose the IAM role you created in the previous procedure (for example, **EC2InstanceRole**).

🚺 Note

Do not leave the instance role blank as this creates a default role and does not select the role you created.

- 9. Under **Summary**, under **Number of instances**, enter 2.
- 10. Choose Launch instance.
- 11. You can view the status of the launch on the **Instances** page. When you launch an instance, its initial state is pending. After the instance starts, its state changes to running, and it receives

a public DNS name. (If the **Public DNS** column is not displayed, choose the **Show/Hide** icon, and then select **Public DNS**.)

Step 2: Add artifact bucket permissions to the EC2 instance role

You must update the EC2 instance role you created for your instance to allow it access to your pipeline's artifact bucket.

🚯 Note

When you create the instance, you create or use an existing EC2 instance role. To avoid Access Denied errors, you must add S3 bucket permissions to the instance role to give the instance permissions to the CodePipeline artifact bucket. Create a default role or update your existing role with the s3:GetObject permission scoped down to the artifact bucket for your pipeline's Region.

- 1. Navigate to your pipeline in the CodePipeline console. Choose **Settings**. View the name and location of the artifact store for an existing pipeline. Make a note of the artifact bucket Amazon Resource Name (ARN) and copy it.
- 2. Navigate to the IAM console and choose **Roles**. Choose the instance role you created in Step 1 of this tutorial.
- 3. On the **Permissions** tab, choose **Add inline policy**.
- 4. Add the following JSON to the policy document, replacing the value in the Resource field with the bucket ARN.

```
{
    "Effect": "Allow",
    "Principal": "*",
    "Action": "s3:GetObject",
    "Resource": "arn:aws:s3:::BucketName"
}
```

5. Choose Update.

Step 3: Add a script file to your repository

Paste this sample text to create your script.sh file for the post-script step in the deployment.

echo "Hello World!"

To add a script.sh file to your source repository

- 1. Open a text editor and then copy and paste the file above into a new file.
- 2. Commit and push your script.sh file to your source repository.
 - a. Add the file.

git add .

b. Commit the change.

git commit -m "Adding script.sh."

c. Push the commit.

git push

Make a note of the path in your repository.

/MyDemoRepo/test/script.sh

Step 4: Creating your pipeline

Use the CodePipeline wizard to create your pipeline stages and connect your source repository.

To create your pipeline

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.

- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, choose **Use existing service role**, and then choose the CodePipeline service role that has been updated with the required permissions for this action. To configure your CodePipeline service role for this action, see <u>Service role policy permissions for the EC2 deploy</u> action.
- 7. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **GitHub (via GitHub App)**.
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
 - c. In **Repository name**, choose the name of your GitHub repository.

Choose Next.

- 9. On the **Step 4: Add build stage** page, choose **Skip**.
- 10. On the **Step 5: Add deploy stage** page, choose **EC2**.

L	
SourceArtifact X Defined by: Source	
No more than 100 characters	
Instance type Choose the instance type that you want to deploy to. Supported types are Amazon EC2 instances or AWS Systems Manag	er (SSM) managed nodes. You must have already created, tagged, and installed the SSM agent on all instances.
EC2	•
You can add one group of tags for EC2 instances to this deployment group. One tag group: Any instance identified by the tag group will be deployed to.	
Key	Value - optional
Q Name X	Q ec2 X
Matching instances 1 unique matched instance. Click here for details 🖸	
Deploy specifications	
• Use action configurations Store deploy specifications as action configurations	Use a DeploySpec file Store deploy specifications in a YAML-formatted DeploySpec file
Target directory Specify the location of the target directory you want to deploy to. Use an absolute path like '/home/ec2-user/deploy'.	
/home/ec2-user/testhelloworld	
PreScript - optional Path to the executable script file that runs BEFORE the Deploy event. It should be relative to the root directory of your up	ploaded source artifact. Use a relative path like 'uploadDir/preScript.sh'.
PostScript Path to the executable script file that runs AFTER the Deploy event. It should be relative to the root directory of your uplue	oaded source artifact. Use a relative path like 'uploadDir/postScript.sh'.
test/script.sh	

a. For **Target directory**, enter the directory on the instance that you want to deploy to, such as /home/ec2-user/testhelloworld.

Note

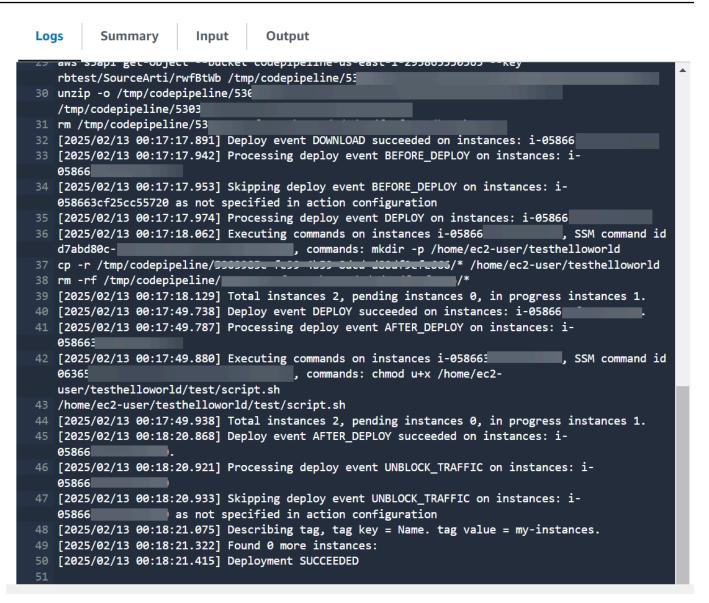
Specify the deployment directory that you want the action to use on the instance. The action will automate creating the specified directory on the instance as part of the deployment.

- b. For **PostScript**, enter the path and file name for your script, such as test/script.sh.
- c. Choose **Next**.
- 11. On the **Step 6: Review** page, review your pipeline configuration and choose **Create pipeline** to create the pipeline.

Source	
GitHub (via GitHub App)	
Succeeded - <u>42 minutes ago</u>	
<u>f8c490e7</u>	
View details	
f8c490e7 Source: Edited script.sh	
Disable transition	
DeploytoEC2 Succeeded	Start rollback
ipeline execution ID: <u>e4e931ec-56cb</u>	
EC2Deploy	
Amazon EC2	
Succeeded - <u>38 minutes ago</u>	
View details	

12. After the pipeline runs successfully, choose **View details** to view the logs on the action to view the managed compute action output.

Logs Summary Input Output
Showing the last 38 lines of the build log. <u>View entire log</u>
A Show previous logs
<pre>1 [2025/02/13 00:15:04.521] Describing tag, tag key = Name. tag value = my-instances. 2 [2025/02/13 00:15:04.784] Found 2 instances: i-0145; , i-0586; 3 [2025/02/13 00:15:04.873] Processing deploy event BLOCK_TRAFFIC on instances: i- 0145;</pre>
4 [2025/02/13 00:15:04.891] Skipping deploy event BLOCK_TRAFFIC on instances: i-0145 as not specified in action configuration
 5 [2025/02/13 00:15:04.918] Processing deploy event DOWNLOAD on instances: i-0145; 6 [2025/02/13 00:15:05.093] Executing commands on instances i-0145 , SSM command id 9d57dace- , commands: mkdir -p /tmp/codepipeline/53
7 aws s3api get-objectbucket codepipeline-us-east-1-2938(key
rbtest/SourceArti/rwfBtWb /tmp/codepipeline/530
8 unzip -o /tmp/codepipeline/530398
/tmp/codepipeline/530
9 rm /tmp/codepipeline/5303985c-fc99-4
10 [2025/02/13 00:15:38.340] Deploy event DOWNLOAD succeeded on instances: i-0145
<pre>11 [2025/02/13 00:15:38.397] Processing deploy event BEFORE_DEPLOY on instances: i- 0145;</pre>
12 [2025/02/13 00:15:38.412] Skipping deploy event BEFORE_DEPLOY on instances: i- 0145; as not specified in action configuration
13 [2025/02/13 00:15:38.436] Processing deploy event DEPLOY on instances: i-0145
14 [2025/02/13 00:15:38.523] Executing commands on instances i-0145 , SSM command id
6c7d0e01-(), commands: mkdir -p /home/ec2-user/testhelloworld
15 cp -r /tmp/codepipeline/530
16 rm -rf /tmp/codepipeline/53
17 [2025/02/13 00:16:13.616] Deploy event DEPLOY succeeded on instances: i-0145 7.
18 [2025/02/13 00:16:13.673] Processing deploy event AFTER_DEPLOY on instances: i- 0145



Step 5: Test Your Pipeline

Your pipeline should have everything for running an end-to-end native Amazon continuous deployment. Now, test its functionality by pushing a code change to your source repository.

To test your pipeline

- 1. Make a code change to your configured source repository, commit, and push the change.
- 2. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 3. Choose your pipeline from the list.

- 4. Watch the pipeline progress through its stages. Your pipeline should complete and your action deploys the script on your instances.
- 5. For more troubleshooting information, see <u>EC2 Deploy action fails with an error message No</u> <u>such_file</u>.

Tutorial: Build and push a Docker image to Amazon ECR with CodePipeline (V2 type)

This tutorial helps you to create a build action in CodePipeline that runs and pushes your Docker image to Amazon ECR after a change to your source code. This tutorial also shows you how to add an Amazon ECS deploy action that deploys your pushed image.

🔥 Important

As part of creating a pipeline in the console, an S3 artifact bucket will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🚺 Note

This tutorial is for the ECRBuildAndPublish build action for a CodePipeline pipeline with a GitHub source repository and an Amazon ECS standard action for deploying to an Amazon ECS cluster. For a tutorial that uses a pipeline with an ECR image repository as the source for an Amazon ECS to CodeDeploy blue/green deployment action in CodePipeline, see <u>Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy</u> <u>deployment</u>.

🔥 Important

This action uses CodePipeline managed CodeBuild compute to run commands in a build environment. Running the commands action will incur separate charges in Amazon CodeBuild.

Prerequisites

There are a few resources that you must have in place before you can use this tutorial to create your CD pipeline. Here are the things you need to get started:

🚯 Note

All of these resources should be created within the same Amazon Region.

- A source control repository (this tutorial uses GitHub) where you will add the following for this tutorial:
 - In Step 1, you will add a sample Dockerfile to your source repository as the input artifact for the ECRBuildAndPublish build action in CodePipeline.
 - In Step 2, you will add a sample imagedefinitions.json file to your source repository as a requirement for the Amazon ECS standard deploy action in CodePipeline.
- An Amazon ECR image repository that contains an image you have built from your Dockerfile.
 For more information, see <u>Creating a Repository</u> and <u>Pushing an Image</u> in the Amazon Elastic Container Registry User Guide.
- An Amazon ECS cluster and service created in the same Region as the image repository. For more
 information, see <u>Creating a Cluster</u> and <u>Creating a Service</u> in the Amazon Elastic Container Service
 Developer Guide.

After you have satisfied these prerequisites, you can proceed with the tutorial and create your CD pipeline.

Step 1: Add a Dockerfile to your source repository

This tutorial uses the ECRBuildAndPublish action to build your Docker image and push the image to Amazon ECR. The managed compute action in CodePipeline uses CodeBuild to run the commands

Amazon CodePipeline

for the ECR login and image push. You do not need to add a buildspec.yml file to your source code repository to tell CodeBuild how to do that. You only provide the Dockerfile in your repository as follows for this example.

Paste this sample text to create your Dockerfile file. This sample Dockerfile is the same as the sample used in the ECR image instructions in the prerequisites.

```
FROM public.ecr.aws/amazonlinux/amazonlinux:latest
# Install dependencies
RUN yum update -y && \
yum install -y httpd
# Install apache and write hello world message
RUN echo 'Hello World!' > /var/www/html/index.html
# Configure apache
RUN echo 'mkdir -p /var/run/httpd' >> /root/run_apache.sh && \
echo 'mkdir -p /var/lock/httpd' >> /root/run_apache.sh && \
echo '/usr/sbin/httpd -D FOREGROUND' >> /root/run_apache.sh && \
chmod 755 /root/run_apache.sh
EXPOSE 80
CMD /root/run_apache.sh
```

To add a Dockerfile file to your source repository

- 1. Open a text editor and then copy and paste the Dockerfile above into a new file.
- 2. Commit and push your Dockerfile file to your source repository.
 - a. Add the file.

git add .

b. Commit the change.

git commit -m "Adding Dockerfile."

c. Push the commit.

git push

Be sure to place the file at the root level of your repository.

/ Dockerfile

Step 2: Add an imagedefinitions.json file to your source repository

This tutorial uses the Amazon ECS standard deploy action in CodePipeline to deploy your container to your Amazon ECS cluster. The Amazon ECS standard deploy action requires an imagedefinitions.json file containing your image name and URI. For more information about the imagedefinitions.json file, see <u>imagedefinitions.json file for Amazon ECS standard deployment</u> actions.

Paste this sample text to create your imagedefinitions.json file. Use the name in your Dockerfile, such as hello-world, and use the URI from your Amazon ECR repository where the image is stored.

To add an imagedefinitions.json file to your source repository

- 1. Open a text editor and then copy and paste the example above into a new file.
- 2. Commit and push your imagedefinitions.json file to your source repository.
 - a. Add the file.

git add .

b. Commit the change.

```
git commit -m "Adding imagedefinitions.json."
```

c. Push the commit.

git push

Be sure to place the file at the root level of your repository.

/ imagedefinitions.json

Step 3: Creating your pipeline

Use the CodePipeline wizard to create your pipeline stages and connect your source repository.

To create your pipeline

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In Service role, choose New service role to allow CodePipeline to create a service role in IAM.
- 7. Leave the settings under Advanced settings at their defaults, and then choose Next.
- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **GitHub (via GitHub App)**.
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see GitHub connections.
 - c. In **Repository name**, choose the name of your GitHub repository.
 - d. In **Default branch**, choose the branch that you want to specify when the pipeline is started manually or with a source event that is not a Git tag. If the source of the change is

not the trigger or if a pipeline execution was started manually, then the change used will be the HEAD commit from the default branch.

Choose Next.

9. On the **Step 4: Add build stage** page, choose **Other build providers** choose **ECRBuildAndPublish**.

tep 1	Add build stage Info
hoose creation option	Step 4 of 6
tep 2 hoose pipeline settings	Build - optional
ер 3	
dd source stage	Build provider Choose the tool you want to use to run build commands and specify artifacts for your build action.
tep 4 dd build stage	Commands Other build providers
tep 5	AWS ECRBuildAndPublish
dd deploy stage	ECR Repository Name Enter a name for the ECR repository
eview	Q actions/image-repo
	Image Tag - optional Enter an image tag
	Dockerfile Path - optional Enter the path to the Dockerfile
	Region
	US East (N. Virginia)
	Input artifacts Choose an input artifact for this action. Learn more [7]

- a. For **ECR repository name**, choose your image repository.
- b. Choose **Next**.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**. You will add the ECS action in the following step.
- 12. On the **Step 7: Review** page, review your pipeline configuration and choose **Create pipeline** to create the pipeline.
- 13. Edit your pipeline to add the Amazon ECS deploy action to your pipeline:
 - a. In the upper right, choose **Edit**.
 - b. At the bottom of the diagram, choose **+ Add stage**. In **Stage name**, enter a name, such as **Deploy**.
 - c. Choose + Add action group.
 - d. In **Action name**, enter a name.
 - e. In **Action provider**, choose Amazon ECS. Allow **Region** to default to the pipeline Region.
 - f. In **Input artifacts**, choose the input artifact from the source stage, such as SourceArtifact.
 - g. For **Cluster name**, choose the Amazon ECS cluster in which your service is running.
 - h. For **Service name**, choose the service to update.
 - i. Choose **Save**.
 - j. On the stage you are editing, choose **Done**. In the Amazon CodePipeline pane, choose **Save**, and then choose **Save** on the warning message.
 - k. To submit your changes and start a pipeline build, choose **Release change**, and then choose **Release**.
- 14. After the pipeline runs, view the pipeline structure and status.

•		
⊘ Build Succeeded	Start rollback	
Pipeline execution ID: <u>186696f4-0925-4</u>		
Build AWS ECRBuildAndPublish Succeeded - <u>5 minutes ago</u>		0
Disable transition		
O Deploy Succeeded	Start rollback	
Pipeline execution ID: 186696f4-0925-		
DeploytoECS Amazon ECS 2 Succeeded - <u>1 minute ago</u> View details		
3524bc39 Source: Added imagedefinitions.json		

15. After the pipeline runs successfully, choose **View details** to view the logs on the action to view the managed compute action output.



16. Troubleshoot any failed actions. For example, the ECS deploy action can fail if the imagedefinitions.json file is not in the source repository. The following is an example of the error message that displays when the imagedefinitions.json file is missing.

Developer Tools > CodePipeline > Pipelines > ecrbuild-to-ecs > Debug ecrbuild-to-ecs					
ecrbuild-to-ecs		Back to pipeline Release change			
√ ⊙ Source	 Pipeline execution details 				
 Source GitHub (via GitHub App) ✓ Ø Build 	DeploytoECS Action execution ID: 68e3ec5a-5f06-4				
 ➢ Build AWS ECRBuildAndPublish ✓ ⊗ Deploy 	Summary Input				
DeploytoECS Amazon ECS	Status S Failed	Last updated Just now			
	Action execution ID				
	Error code Invalid action configuration				
	Error message Did not find the image definition file imagedefi file is stored in your pipeline's Amazon S3 artifa key: ecrbuild-to-ecs/SourceArti/	nitions.json in the input artifacts ZIP file. Verify the act bucket: codepipeline-us-east-1-			

Step 4: Test Your Pipeline

Your pipeline should have everything for running an end-to-end native Amazon continuous deployment. Now, test its functionality by pushing a code change to your source repository.

To test your pipeline

- 1. Make a code change to your configured source repository, commit, and push the change.
- 2. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 3. Choose your pipeline from the list.
- 4. Watch the pipeline progress through its stages. Your pipeline should complete and your action pushes the Docker image to ECR that was created from your code change.

Tutorial: Deploy to Amazon EKS with CodePipeline

This tutorial helps you to create a deploy action in CodePipeline that deploys your code to a cluster you have configured in Amazon EKS.

The EKS action supports both public and private EKS clusters. Private clusters are the type recommended by EKS; however, both types are supported.

1 Note

As part of creating a pipeline in the console, an S3 artifact bucket will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🚯 Note

This action uses CodePipeline managed CodeBuild compute to run commands in a build environment. Running the commands action will incur separate charges in Amazon CodeBuild.

🚺 Note

The EKS deploy action is only available for V2 type pipelines.

Prerequisites

There are a few resources that you must have in place before you can use this tutorial to create your CD pipeline. Here are the things you need to get started:

🚯 Note

All of these resources should be created within the same Amazon Region.

- A source control repository (this tutorial uses GitHub) where you will add a sample deployment.yaml file.
- You must use an existing CodePipeline service role that you will update with the permissions for this action using <u>Step 3: Update the CodePipeline service role policy in IAM</u> below. The permissions needed are based on the type of cluster you create. For more information, see <u>Service role policy permissions</u>.
- A working image and repository tag that you have pushed to ECR or your image repository.

After you have satisfied these prerequisites, you can proceed with the tutorial and create your CD pipeline.

Step 1: (Optional) Create a cluster in Amazon EKS

You can choose to create an EKS cluster with a public or private endpoint.

In the following steps, you create a public or a private cluster in EKS. This step is optional if you have already created your cluster.

Create a public cluster in Amazon EKS

In this step, you create a cluster in EKS.

Create a public cluster

- 1. Open the EKS console, and then choose **Create cluster**.
- 2. In Name, name your cluster. Choose Next.
- 3. Choose **Create**.

Create a private cluster in Amazon EKS

In case you choose to create a cluster with a private endpoint, make sure to attach the private subnets only, and make sure they have internet connection.

Follow the next five sub-steps for creating a cluster with a private endpoint.

Create a VPC in the console

- 1. Open the VPC console, and then choose **Create VPC**.
- 2. Under VPC settings, choose VPC and more.

- 3. Choose to create one public and 4 private subnets. Choose **Create VPC**.
- 4. On the subnets page, choose **Private**.

Determine the private subnets in your VPC

- 1. Navigate to your VPC and choose the VPC ID to open the VPC details page.
- 2. On the VPC details page, choose the **Resource map** tab.
- 3. View the diagram and make a note of your private subnets. The subnets display with labels to indicate public or private status, and each subnet is mapped to a route table.

VPC Show details	Subnets (6)	Route tables (6)	
Your AWS virtual network	Subnets within this VPC	Route network traffic to resources	
project-vpc	us-east-1a	project-rtb-private2-us-east-1b	
	A project-subnet-public1-us-east-1a	project-rtb-private4-us-east-1b	
	A project-subnet-private3-us-east-1a	project-rtb-private1-us-east-1a	
	A project-subnet-private1-us-east-1a	rtb-0a3d97c04	
	us-east-1b	project-rtb-private3-us-east-1a	::
	B project-subnet-public2-us-east-1b	- project-rtb-public	
	B project-subnet-private2-us-east-1b		
	B project-subnet-private4-us-east-1b		

Note that a private cluster will have all private subnets.

4. Create a public subnet to host the NAT gateway. You can attach only one internet gateway to a VPC at a time.

Create a NAT gateway in the public subnet

- In the public subnet, create a NAT gateway. Navigate to the VPC console, and then choose Internet gateways. Choose Create internet gateway.
- 2. In Name, enter a name for your internet gateway. Choose **Create internet gateway**.

Update the route table for the private subnet to direct traffic to the NAT gateway.

Add the NAT gateway to your route tables for your private subnets

1. Navigate to the VPC console, and then choose **Subnets**.

- 2. For each private subnet, choose it and then choose the route table for that subnet on the details page, Choose **Edit route table**.
- Update the route table for the private subnet to direct internet traffic to the NAT gateway. Choose Add route. Choose NAT gateway from the options to add. Choose the internet gateway you created.
- 4. For the public subnet, create a custom route table. Verify that the network access control list (ACL) for your public subnet allows inbound traffic from the private subnet.
- 5. Choose **Save changes**.

In this step, you create a cluster in EKS.

Create a private cluster

- 1. Open the EKS console, and then choose **Create cluster**.
- 2. In Name, name your cluster. Choose Next.
- 3. Specify your VPC and other configuration information. Choose **Create**.

Your EKS cluster can be a public or a private cluster. This step is for clusters that have ONLY a private endpoint. Make sure that if your cluster is private.

Step 2: Configure your private cluster in Amazon EKS

This step is applicable only if you have created a private cluster. This step is for clusters that have ONLY a private endpoint.

Configure your cluster

- Attach private subnets only in the EKS cluster under the Networking tab. Attach the private subnets captured in the Determine the private subnets in your VPC section under <u>Step 1</u>: (Optional) Create a cluster in Amazon EKS.
- 2. Make sure that the private subnets have access to the internet since CodePipeline stores and retrieves artifacts from the S3 artifact bucket for your pipeline.

Step 3: Update the CodePipeline service role policy in IAM

In this step, you will update an existing CodePipeline service role, such as **cp-service-role**, with permissions required by CodePipeline to connect with your cluster. If you do not have existing role, create a new one.

Update your CodePipeline service role with the following steps.

To update your CodePipeline service role policy

- 1. Open the IAM console at https://console.amazonaws.cn/iam/).
- 2. From the console dashboard, choose Roles.
- 3. Look up your CodePipeline service role, such as **cp-service-role**.
- 4. Add a new inline policy.
- 5. In the **Policy editor**, enter the following.
 - For a public cluster, add the following permissions.

```
{
    "Statement": [
        {
            "Sid": "EksClusterPolicy",
            "Effect": "Allow",
            "Action": "eks:DescribeCluster",
            "Resource": "arn:aws:eks:us-east-1:ACCOUNT-ID:cluster/my-cluster"
        },
        {
            "Sid": "EksVpcClusterPolicy",
            "Effect": "Allow",
            "Action": [
                "ec2:DescribeDhcpOptions",
                "ec2:DescribeNetworkInterfaces",
                "ec2:DescribeRouteTables",
                "ec2:DescribeSubnets",
                "ec2:DescribeSecurityGroups",
                "ec2:DescribeVpcs"
            ],
            "Resource": [
                "*"
            ٦
        ſ
```

```
],
"Version": "2012-10-17"
}
```

• For a private cluster, add the following permissions. Private clusters will require additional permissions for your VPC, if applicable.

```
{
    "Statement": [
        {
            "Sid": "EksClusterPolicy",
            "Effect": "Allow",
            "Action": "eks:DescribeCluster",
            "Resource": "arn:aws:eks:us-east-1:ACCOUNT-ID:cluster/my-cluster"
        },
        {
            "Sid": "EksVpcClusterPolicy",
            "Effect": "Allow",
            "Action": [
                "ec2:DescribeDhcpOptions",
                "ec2:DescribeNetworkInterfaces",
                "ec2:DescribeRouteTables",
                "ec2:DescribeSubnets",
                "ec2:DescribeSecurityGroups",
                "ec2:DescribeVpcs"
            ],
            "Resource": [
                "*"
            ]
        },
        {
            "Effect": "Allow",
            "Action": "ec2:CreateNetworkInterface",
            "Resource": "*",
            "Condition": {
                "StringEqualsIfExists": {
                      "ec2:Subnet": [
                         "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-03ebd65daeEXAMPLE",
                         "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0e377f6036EXAMPLE",
                         "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0db658ba1cEXAMPLE",
```

```
"arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0db658ba1cEXAMPLE"
                    1
                }
            }
        },
        {
            "Effect": "Allow",
            "Action": "ec2:CreateNetworkInterfacePermission",
            "Resource": "*",
            "Condition": {
                "ArnEquals": {
                    "ec2:Subnet": [
                         "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-03ebd65daeEXAMPLE",
                        "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0e377f6036EXAMPLE",
                        "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0db658ba1cEXAMPLE",
                        "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0db658ba1cEXAMPLE"
                    1
                }
            }
        },
        {
            "Effect": "Allow",
            "Action": "ec2:DeleteNetworkInterface",
            "Resource": "*",
            "Condition": {
                "StringEqualsIfExists": {
                     "ec2:Subnet": [
                         "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-03ebd65daeEXAMPLE",
                        "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0e377f6036EXAMPLE",
                        "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0db658ba1cEXAMPLE",
                        "arn:aws:ec2:us-east-1:ACCOUNT-ID:subnet/
subnet-0db658ba1cEXAMPLE"
                    ]
                }
            }
        }
```

```
],
"Version": "2012-10-17"
}
```

6. Choose **Update policy**.

Step 4: Create an access entry for the CodePipeline service role

In this step, you create an access entry on your cluster that will add the CodePipeline service role you updated in Step 3, along with a managed access policy.

- 1. Open the EKS console and navigate to your cluster.
- 2. Choose the **Access** tab.
- 3. Under IAM access entries, choose Create access entry.
- 4. In IAM principal ARN, enter the role you just updated for the action, such as **cp-servicerole**. Choose **Next**.
- 5. On the **Step 2: Add access policy** page, in **Policy name**, choose the managed policy for access, such as AmazonEKSClusterAdminPolicy. Choose **Add policy**. Choose **Next**.

🚯 Note

This is the policy that the CodePipeline action uses to talk to Kubernetes. As a best practice, to scope down permissions in your policy with least privilege rather than the administrative policy, attach a custom policy instead.

6. On the review page, choose **Create**.

Step 5: Create a source repository and add the helm chart config files

In this step, you create a config file that is appropriate for your action (Kubernetes manifest files or Helm chart) and store the config file in your source repository. Use the appropriate file for your configuration. For more information, see https://kubernetes.io/docs/reference/kubectl/quick-reference/ or https://helm.sh/docs/topics/charts/.

- For Kubernetes, use a manifest file.
- For Helm, use a Helm chart.

- 1. Create or use an existing GitHub repository.
- 2. Create a new structure in your repository for your helm chart files as shown in the example below.

mycł	nart
	Chart.yaml
	charts
	templates
I I	NOTES.txt
I I	helpers.tpl
I I	<pre> deployment.yaml</pre>
I I	ingress.yaml
I I	` service.yaml
`	values.yaml

3. Add the file to the root level of your repository.

Step 6: Creating your pipeline

Use the CodePipeline wizard to create your pipeline stages and connect your source repository.

To create your pipeline

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyEKSPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, choose the service role that you updated in Step 3.
- 7. Leave the settings under Advanced settings at their defaults, and then choose Next.
- 8. On the **Step 3: Add source stage** page, for **Source provider**, choose **to create a connection to your GitHub repository**.
- 9. On the Step 4: Add build stage page, choose Skip.
- 10. On the Step 5: Add deploy stage page, choose Amazon EKS.

Deploy configuration type

Please select deploy configuration type.

0	Helm			
	Helm configuration type			

🔘 Kubectl

Kubectl configuration type

Helm release name

Enter the helm release name.

my-release

Helm chart location

Enter folder location of helm chart.

nginx-chart

Override for helm values files - optional

Enter comma-separated helm values files in helm chart location.

Kubernetes namespace - optional

You can provide a name for the Kubernetes namespace to override the default.

Subnet IDs

Specify the subnet IDs that your compute action will use.

- a. Under **Deploy configuration type**, choose **Helm**.
- b. In **Helm chart location**, enter the release name, such as my-release. For **Helm chart location**, enter the path for your helm chart files, such as mychart.
- c. Choose **Next**.
- 11. On the **Step 6: Review** page, review your pipeline configuration and choose **Create pipeline** to create the pipeline.

Pipeline execution ID: 0483d26d-5000-2	<u>4</u>
	2
Source GitHub (via GitHub App)	
Succeeded - <u>3 minutes ago</u>	
<u>11412f6c</u> 🛛	
View details	
<u>11412f6c</u> Source: Update helm chart values.yaml	
Disable transition	
Deploy Succeeded	
Disable transition Disable transition Disable transition Succeeded Pipeline execution ID: 0483d26d-5000	
Deploy Succeeded	
Deploy Succeeded Pipeline execution ID: 0483d26d-5000	
Deploy Succeeded	
O Deploy Succeeded Pipeline execution ID: 0483d26d-5000 Deploy	

12. After the pipeline runs successfully, choose **View details** to view the logs on the action to view the action output.

Tutorial: Create a pipeline that runs commands with compute (V2 type)

In this tutorial, you configure a pipeline that continuously runs provided build commands using the Commands action in a build stage. For more information about the Commands action, see <u>Commands action reference</u>.

🔥 Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

Prerequisites

You must already have the following:

• A GitHub repository. You can use the GitHub repository you created in <u>Tutorial: Use full clone</u> with a GitHub pipeline source.

Step 1: Create source files and push to your GitHub repository

In this section, you create and push your example source files to the repository that the pipeline uses for your source stage. For this example, you produce and push the following:

• A README.txt file.

To create source files

1. Create a file with the following text:

Sample readme file

2. Save the file as README.txt.

To push files to your GitHub repository

 Push or upload the files to your repository. These files are the source artifact created by the Create Pipeline wizard for your deployment action in Amazon CodePipeline. Your files should look like this in your local directory:

README.txt

- 2. To use the Git command line from a cloned repository on your local computer:
 - a. Run the following command to stage all of your files at once:

git add -A

b. Run the following command to commit the files with a commit message.

git commit -m "Added source files"

c. Run the following command to push the files from your local repo to your repository:

git push

Step 2: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with a GitHub (via GitHub App) action for the repository where the source files are stored.
- A build stage with the Commands action.

To create a pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyCommandsPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In Service role, choose New service role to allow CodePipeline to create a service role in IAM.

🚺 Note

If you are using an existing service role, to use the Commands action, you will need to add the following permissions for the service role. Scope down the permissions

User Guide

to the pipeline resource level by using resource-based permissions in the service role policy statement. For more information, see the policy example in <u>Service role policy</u> permissions.

- logs:CreateLogGroup
- logs:CreateLogStream
- logs:PutLogEvents
- 7. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **GitHub (via GitHub App)**.
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see GitHub connections.
 - c. In **Repository name**, choose the name of your GitHub.com repository.
 - d. In **Default branch**, choose the branch that you want to specify when the pipeline is started manually or with a source event that is not a Git tag. If the source of the change is not the trigger or if a pipeline execution was started manually, then the change used will be the HEAD commit from the default branch. Optionally, you can also specify webhooks with filtering (triggers). For more information, see <u>Automate starting pipelines using triggers and filtering</u>.

Choose Next.

9. In Step 4: Add build stage, choose Commands.

🚺 Note

Running the Commands action will incur separate charges in Amazon CodeBuild.

Enter the following commands:

```
ls
echo hello world
cat README.txt
echo pipeline Execution Id is #{codepipeline.PipelineExecutionId}
```

Choose Next .	
Add source stage	Build - optional
Step 3	
Add build stage	Build provider Choose the tool you want to use to run build commands and specify artifacts for your build action.
Step 4 Add deploy stage	O Commands O ther build providers
Step 5 Review	Commands Specify the shell commands to run with your compute action in CodePipeline. You do not need to create any resources in CodeBuild. Note: Using compute time for this action will incur separate charges in AWS CodeBuild.
	ls echo hello world echo pipeline Execution Id is #{codepipeline.PipelineExecutionId}
	Input artifacts Choose an input artifact for this action. Learn more 🔀
	SourceArtifact X Defined by: Source No more than 100 characters
	Cancel Previous Skip build stage Next

10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

11. In **Step 6: Add deploy stage**, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 12. In **Step 7: Review**, review the information, and then choose **Create pipeline**.
- 13. As a final step for creating your action, add an environment variable to the action that will result in an output variable for the action. On the Commands action, choose **Edit**. On the **Edit** screen, specify a variable namespace for your action by entering compute in the **Variable namespace** field.

Add the CodeBuild output variable AWS_Default_Region, and then choose Add variable.

Input artifacts

Choose an input artifact for this action. Learn more [

Choose an input artifact for this action. Learn more	FAC Ovi
SourceArtifact X Defined by: Source	
No more than 100 characters	
Commands Specify the shell commands to run with your compute action in CodePipeline. You do no CodeBuild.	ot need to create any resources in CodeBuild. Note: Using compute time for this action will incur separ
ls	
echo hello	
echo pipeline Execution Id is #{codepipeline.PipelineExecutionId}	
Variable namespace - optional	
Choose a namespace for the output variables from this action. You must choose a name	espace if you want to use the variables this action produces in your configuration. Learn more [
compute	
Variables Specify the names of the variables in your environment that you want to export.	
AWS_DEFAULT_REGION	Add variable
Output artifacts Choose a name for the output of this action. CodePipeline will create the output artifac	t for your pipeline artifact store.
Name	
Files	
	Add to file
	paths

Step 3: Run your pipeline and verify build commands

Release a change to run your pipeline. Verify that the build commands ran by viewing the execution history, the build logs, and the output variables.

To view action logs and output variables

- After the pipeline runs successfully, you can view the logs and output for the action. 1.
- 2. To view the output variables for the action, choose **History**, and then choose **Timeline**.

View the output variable that was added to the action. The output for the Commands action shows the output variable resolved to the action Region.

Artifacts		
Artifact name	Artifact type	Artifact provider
SourceArtifact [2]	Input	Amazon S3
Output variables		
Кеу		Value
AWS_DEFAULT_REGION		us-east-1

3. To view the logs for the action, choose **View details** on the successful Commands action. View the logs for the Commands action.

Action execution details

Action name: Commands_action Status: Succeeded

				THADED YOUNG IN THALF I
				BUILD: 3 commands
17	[Container]	2024/10/02	15:04:32.669974	Phase complete: DOWNLOAD_SOURCE State: SUCCEEDED
18	[Container]	2024/10/02	15:04:32.669989	Phase context status code: Message:
19	[Container]	2024/10/02	15:04:32.764013	Entering phase INSTALL
20	[Container]	2024/10/02	15:04:32.769349	Phase complete: INSTALL State: SUCCEEDED
21	[Container]	2024/10/02	15:04:32.769369	Phase context status code: Message:
22	[Container]	2024/10/02	15:04:32.815049	Entering phase PRE_BUILD
23	[Container]	2024/10/02	15:04:32.820275	Phase complete: PRE_BUILD State: SUCCEEDED
24	[Container]	2024/10/02	15:04:32.820297	Phase context status code: Message:
25	[Container]	2024/10/02	15:04:32.865495	Entering phase BUILD
26	[Container]	2024/10/02	15:04:32.915050	Running command ls
27	README.txt			
28				
29	[Container]	2024/10/02	15:04:32.923632	Running command echo hello
30	hello			
31				
32	[Container]	2024/10/02	15:04:32.929143	Running command echo pipeline Execution Id is a55e3d
33				
34				
35	[Container]	2024/10/02	15:04:32.937518	Phase complete: BUILD State: SUCCEEDED
36	[Container]	2024/10/02	15:04:32.937536	Phase context status code: Message:
37	[Container]	2024/10/02	15:04:32.986928	Entering phase POST_BUILD
38	[Container]	2024/10/02	15:04:32.992223	Phase complete: POST_BUILD State: SUCCEEDED
39	[Container]	2024/10/02	15:04:32.992242	Phase context status code: Message:
40				

Tutorial: Use Git tags to start your pipeline

In this tutorial, you will create a pipeline that connects to your GitHub repository where the source action is configured for the Git tags trigger type. When a Git tag is created on a commit, your pipeline starts. This example shows you how to create a pipeline that allows filtering for tags

based on the syntax of the tag name. For more information about filtering with glob patterns, see Working with glob patterns in syntax.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

This tutorial connects to GitHub through the CodeStarSourceConnection action type.

🚺 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Topics

- Prerequisites
- Step 1: Open CloudShell and clone your repository
- Step 2: Create a pipeline to trigger on Git tags
- Step 3: Tag your commits for release
- Step 4: Release change and view logs

Prerequisites

Before you begin, you must do the following:

- Create a GitHub repository with your GitHub account.
- Have your GitHub credentials ready. When you use the Amazon Web Services Management Console to set up a connection, you are asked to sign in with your GitHub credentials.

Step 1: Open CloudShell and clone your repository

You can use a command line interface to clone your repository, make commits, and add tags. This tutorial launches a CloudShell instance for the command line interface.

- 1. Sign in to the Amazon Web Services Management Console.
- 2. In the top navigation bar, choose the Amazon icon. The main page of the Amazon Web Services Management Console displays.
- 3. In the top navigation bar, choose the Amazon CloudShell icon. CloudShell opens. Wait while the CloudShell environment is created.

🚯 Note

If you don't see the CloudShell icon, make sure that you're in a <u>Region supported by</u> <u>CloudShell</u>. This tutorial assumes you are in the US West (Oregon) Region.

- 4. In GitHub, navigate to your repository. Choose **Code**, and then choose **HTTPS**. Copy the path. The address to clone your Git repository is copied to your clipboard.
- 5. Run the following command to clone the repository.

git clone https://github.com/<account>/MyGitHubRepo.git

6. Enter your GitHub account Username and Password when prompted. For the Password entry, you must use a user-created token rather than your account password.

Step 2: Create a pipeline to trigger on Git tags

In this section, you create a pipeline with the following actions:

- A source stage with a connection to your GitHub repository and action.
- A build stage with an Amazon CodeBuild build action.

To create a pipeline with the wizard

- 1. Sign in to the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the Welcome page, Getting started page, or Pipelines page, choose Create pipeline.

- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyGitHubTagsPipeline.
- 5. In **Pipeline type**, keep the default selection at **V2**. Pipeline types differ in characteristics and price. For more information, see <u>Pipeline types</u>.
- 6. In Service role, choose New service role.

🚯 Note

If you choose instead to use your existing CodePipeline service role, make sure that you have added the codestar-connections:UseConnection IAM permission to your service role policy. For instructions for the CodePipeline service role, see <u>Add</u> permissions to the the CodePipeline service role.

7. Under **Advanced settings**, leave the defaults. In **Artifact store**, choose **Default location** to use the default artifact store, such as the Amazon S3 artifact bucket designated as the default, for your pipeline in the Region you selected for your pipeline.

🚯 Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline.

Choose Next.

- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **GitHub (via GitHub App)**.
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
 - c. In **Repository name**, choose the name of your GitHub repository.
 - d. In **Default branch**, choose the branch that you want to specify when the pipeline is started manually or with a source event that is not a Git tag. If the source of the change is not the trigger or if a pipeline execution was started manually, then the change used will be the HEAD commit from the default branch.
 - e. Under **Webhook events**, in **Filter type**, choose **Tags**.

In the Tags or patterns field, enter release*.

A Important

Pipelines that start with a trigger type of Git tags will be configured for WebhookV2 events and will not use the Webhook event (change detection on all push events) to start the pipeline.

Choose Next.

- 9. In Add build stage, add a build stage:
 - a. In **Build provider**, choose **Amazon CodeBuild**. Allow **Region** to default to the pipeline Region.
 - b. Choose **Create project**.
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For **Runtime**, choose **Standard**. For **Image**, choose **aws/codebuild/standard:5.0**.
 - f. For Service role, choose New service role.

🚯 Note

Note the name of your CodeBuild service role. You will need the role name for the final step in this tutorial.

g. Under **Buildspec**, for **Build specifications**, choose **Insert build commands**. Choose **Switch to editor**, and paste the following under **Build commands**.

```
version: 0.2
#env:
    #variables:
        # key: "value"
        # key: "value"
    #parameter-store:
        # key: "value"
        # key: "value"
        # key: "value"
        # git-credential-helper: yes
```

```
phases:
 install:
    #If you use the Ubuntu standard image 2.0 or later, you must specify
 runtime-versions.
    #If you specify runtime-versions and use an image other than Ubuntu
 standard image 2.0, the build fails.
    runtime-versions:
      nodejs: 12
   #commands:
      # - command
      # - command
 #pre_build:
    #commands:
      # - command
      # - command
  build:
    commands:
 #post_build:
    #commands:
      # - command
      # - command
artifacts:
 files:
     _ '*'
    # - location
 name: $(date +%Y-%m-%d)
 #discard-paths: yes
 #base-directory: location
#cache:
 #paths:
    # - paths
```

- h. Choose **Continue to CodePipeline**. This returns to the CodePipeline console and creates a CodeBuild project that uses your build commands for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Choose Next.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 12. On **Step 7: Review**, choose **Create pipeline**.

Step 3: Tag your commits for release

After you create your pipeline and specify Git tags, you can tag commits in your GitHub repository. In these steps, you will tag a commit with the release-1 tag. Each commit in a Git repository must have a unique Git tag. When you choose the commit and tag it, this allows you to incorporate changes from different branches into your pipeline deployment. Note that the tag name release does not apply to the concept of a release in GitHub.

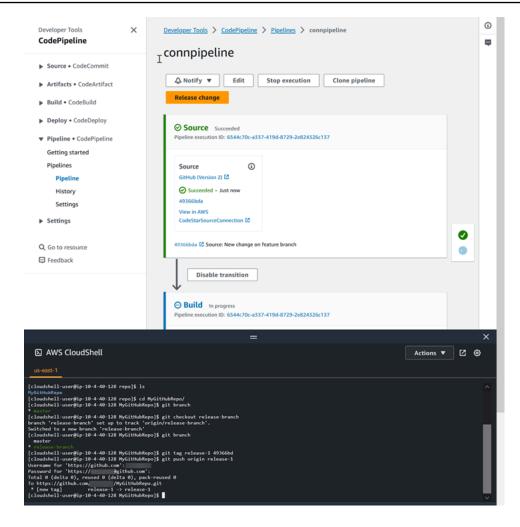
1. Reference the copied commit IDs you want to tag. To view commits in each branch, in the CloudShell terminal, enter the following command to capture the commit IDs you want to tag:

git log

2. In the CloudShell terminal, enter the command to tag your commit and push it to origin. After you tag your commit, you use the git push command to push the tag to origin. In the following example, enter the following command to use the release-1 tag for the second commit with ID 49366bd. This tag will be filtered by the pipeline release* tag filter and will start the pipeline.

git tag release-1 49366bd

git push origin release-1



Step 4: Release change and view logs

1. After the pipeline runs successfully, on your successful build stage, choose **View log**.

Under **Logs**, view the CodeBuild build output. The commands output the value of the entered variable.

2. In the History page, view the Triggers column. View the trigger type GitTag : release-1.

Tutorial: Filter on branch names for pull requests to start your pipeline (V2 type)

In this tutorial, you will create a pipeline that connects to your GitHub.com repository where the source action is configured to start your pipeline with a trigger configuration that filters on pull

requests. When a specified pull request event occurs for a specified branch, your pipeline starts. This example shows you how to create a pipeline that allows filtering for branch names. For more information about working with triggers, see <u>Add filters for push and pull request event types (CLI)</u>. For more information about filtering with regex patterns in glob format, see <u>Working with glob</u> <u>patterns in syntax</u>.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

This tutorial connects to GitHub.com through the CodeStarSourceConnection action type.

Topics

- Prerequisites
- Step 1: Create a pipeline to start on pull request for specified branches
- Step 2: Create and merge a pull request in GitHub.com to start your pipeline executions

Prerequisites

Before you begin, you must do the following:

- Create a GitHub.com repository with your GitHub.com account.
- Have your GitHub credentials ready. When you use the Amazon Web Services Management Console to set up a connection, you are asked to sign in with your GitHub credentials.

Step 1: Create a pipeline to start on pull request for specified branches

In this section, you create a pipeline with the following actions:

- A source stage with a connection to your GitHub.com repository and action.
- A build stage with an Amazon CodeBuild build action.

To create a pipeline with the wizard

- 1. Sign in to the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.
- 2. On the Welcome page, Getting started page, or Pipelines page, choose Create pipeline.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyFilterBranchesPipeline.
- 5. In **Pipeline type**, keep the default selection at **V2**. Pipeline types differ in characteristics and price. For more information, see <u>Pipeline types</u>.
- 6. In Service role, choose New service role.

🚺 Note

If you choose instead to use your existing CodePipeline service role, make sure that you have added the codeconnections:UseConnection IAM permission to your service role policy. For instructions for the CodePipeline service role, see <u>Add permissions to</u> the the CodePipeline service role.

7. Under **Advanced settings**, leave the defaults. In **Artifact store**, choose **Default location** to use the default artifact store, such as the Amazon S3 artifact bucket designated as the default, for your pipeline in the Region you selected for your pipeline.

🚺 Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline.

Choose Next.

- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In Source provider, choose GitHub (via GitHub App).
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
 - c. In **Repository name**, choose the name of your GitHub.com repository.
 - d. Under Trigger type, choose Specify filter.

Under **Event type**, choose **Pull request**. Select all of the events under pull request so that the event occurs for created, updated, or closed pull requests.

Under Branches, in the Include field, enter main*.

it: Triggers					Cancel	Done
For source action:	Source					Remove
Filters						
Pull request			(j)			
Events: Created	Closed	Revised				
Include branches	: main*			+ Add filter		
		1	×			

<u> Important</u>

Pipelines that start with this trigger type will be configured for WebhookV2 events and will not use the Webhook event (change detection on all push events) to start the pipeline.

Choose Next.

- 9. In Step 4: Add build stage, in Build provider, choose Amazon CodeBuild. Allow Region to default to the pipeline Region. Choose or create the build project as instructed in <u>Tutorial: Use Git tags to start your pipeline</u>. This action will only be used in this tutorial as the second stage needed to create your pipeline.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

11. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.

12. On Step 7: Review, choose Create pipeline.

Step 2: Create and merge a pull request in GitHub.com to start your pipeline executions

In this section, you create and merge a pull request. This starts your pipeline, with one execution for the opened pull request and one execution for the closed pull request.

To create a pull request and start your pipeline

- In GitHub.com, create a pull request by making a change to the README.md on a feature branch and raising a pull request to the main branch. Commit the change with a message like Update README.md for PR.
- 2. The pipeline starts with the source revision showing the **Source** message for the pull request as **Update README.md for PR**.

Source Succeeded Pipeline execution ID: 7e1becf6-fc7d-44b5-9157-56e9d7982a93						
Source GitHub (Version 2) ^[2] Succeeded - Just now 030c6b39 ^[2] View details						
030c6b39 I Source: Update README.md for PR Disable transition						
Build In progress Pipeline execution ID: 7e1becf6-fc7d-44b5-9157-56e9d7982a93						

3. Choose **History**. In the pipeline execution history, view the CREATED and MERGED pull request status events that started the pipeline executions.

xe	cution history Info			Rerun Stop ex	vecution View details	Release change
Q						< 1 > {
	Execution ID	Status	Trigger	Started	Duration	Completed
)	61986255	⊘ Succeeded	PullRequest 5 MERGED From repository/branch: /MyGitHubRepo /feature-branch 2 To repository/branch: ./MyGitHubRepo /main 2	Feb 7, 2024 6:26 PM (UTC-8:00)	5 minutes 31 seconds	Feb 7, 2024 6:32 P (UTC-8:00)
)	b9614702	Succeeded	PullRequest 5 CREATED From repository/branch: /MyGitHubRepo /feature-branch 2 To repository/branch: /MyGitHubRepo /main 2	Feb 7, 2024 6:26 PM (UTC-8:00)	4 minutes 7 seconds	Feb 7, 2024 6:30 P (UTC-8:00)
)	09c14335	⊘ Succeeded	Webhook - <u>connection/40d122c4-23fb</u> 48bf-	Feb 5, 2024 1:19 AM (UTC-8:00)	2 days 16 hours	Feb 7, 2024 5:38 P (UTC-8:00)

Tutorial: Use pipeline-level variables

In this tutorial, you will create a pipeline where you add a variable at the pipeline level and run a CodeBuild build action that outputs your variable value.

A Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

Topics

- Prerequisites
- Step 1: Create your pipeline and build project
- Step 2: Release change and view logs

Prerequisites

Before you begin, you must do the following:

- Create a CodeCommit repository.
- Add a .txt file to the repository.

Step 1: Create your pipeline and build project

In this section, you create a pipeline with the following actions:

- A source stage with a connection to your CodeCommit repository.
- A build stage with an Amazon CodeBuild build action.

To create a pipeline with the wizard

- 1. Sign in to the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.
- 2. On the Welcome page, Getting started page, or Pipelines page, choose Create pipeline.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyVariablesPipeline.
- 5. In **Pipeline type**, keep the default selection at **V2**. Pipeline types differ in characteristics and price. For more information, see Pipeline types.
- 6. In **Service role**, choose **New service role**.

🚺 Note

If you choose instead to use your existing CodePipeline service role, make sure that you have added the codeconnections:UseConnection IAM permission to your service role policy. For instructions for the CodePipeline service role, see <u>Add permissions to</u> the the CodePipeline service role.

7. Under Variables, choose Add variable. In Name, enter timeout. In Default, enter 1000. In description, enter the following description: Timeout.

This will create a variable where you can declare the value when the pipeline execution starts. Variable names must match $[A-Za-z0-9@\-]+$ and can be anything except an empty string.

8. Under **Advanced settings**, leave the defaults. In **Artifact store**, choose **Default location** to use the default artifact store, such as the Amazon S3 artifact bucket designated as the default, for your pipeline in the Region you selected for your pipeline.

🚯 Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline.

Choose Next.

- 9. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **Amazon CodeCommit**.
 - b. In **Repository name** and **Branch name**, choose the your repository and branch.

Choose Next.

- 10. In Step 4: Add build stage, add a build stage:
 - a. In **Build provider**, choose **Amazon CodeBuild**. Allow **Region** to default to the pipeline Region.
 - b. Choose **Create project**.
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For Runtime, choose Standard. For Image, choose aws/codebuild/standard:5.0.
 - f. For Service role, choose New service role.

🚯 Note

Note the name of your CodeBuild service role. You will need the role name for the final step in this tutorial.

g. Under Buildspec, for Build specifications, choose Insert build commands. Choose Switch to editor, and paste the following under Build commands. In the buildspec, the customer variable \$CUSTOM_VAR1 will be used to output the pipeline variable in the build log. You will create the \$CUSTOM_VAR1 output variable as an environment variable in the following step.

```
version: 0.2
#env:
  #variables:
     # key: "value"
     # key: "value"
  #parameter-store:
     # key: "value"
     # key: "value"
  #git-credential-helper: yes
phases:
  install:
    #If you use the Ubuntu standard image 2.0 or later, you must specify
 runtime-versions.
    #If you specify runtime-versions and use an image other than Ubuntu
 standard image 2.0, the build fails.
    runtime-versions:
      nodejs: 12
    #commands:
      # - command
      # - command
  #pre_build:
    #commands:
      # - command
      # - command
  build:
    commands:
      - echo $CUSTOM_VAR1
  #post_build:
    #commands:
      # - command
      # - command
artifacts:
  files:
     _ '*'
    # - location
  name: $(date +%Y-%m-%d)
```

```
#discard-paths: yes
#base-directory: location
#cache:
    #paths:
        # - paths
```

- h. Choose **Continue to CodePipeline**. This returns to the CodePipeline console and creates a CodeBuild project that uses your build commands for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Under Environment variables optional, to create an environment variable as an input variable for the build action that will be resolved by the pipeline-level variable, choose Add environment variable. This will create the variable specified in the buildspec as \$CUSTOM_VAR1. In Name, enter CUSTOM_VAR1. In Value, enter #{variables.timeout}. In Type, choose Plaintext.

The #{variables.timeout} value for the environment variable is based on the pipeline-level variable namespace variables and the pipeline-level variable timeout created for the pipeline in step 7.

- j. Choose Next.
- 11. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 12. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 13. On Step 7: Review, choose Create pipeline.

Step 2: Release change and view logs

1. After the pipeline runs successfully, on your successful build stage, choose **View details**.

On the details page, choose the **Logs** tab. View the CodeBuild build output. The commands output the value of the entered variable.

2. In the left-hand nav, choose **History**.

Choose the recent execution, and then choose the **Variables** tab. View the resolved value for the pipeline variable.

Tutorial: Create a simple pipeline (S3 bucket)

The easiest way to create a pipeline is to use the **Create pipeline** wizard in the Amazon CodePipeline console.

In this tutorial, you create a two-stage pipeline that uses a versioned S3 source bucket and CodeDeploy to release a sample application.

🚺 Note

When Amazon S3 is the source provider for your pipeline, you may zip your source file or files into a single .zip and upload the .zip to your source bucket. You may also upload a single unzipped file; however, downstream actions that expect a .zip file will fail.

🔥 Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

After you create this simple pipeline, you add another stage and then disable and enable the transition between stages.

<u> Important</u>

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region. You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see Add a cross-Region action in CodePipeline.

Before you begin, you should complete the prerequisites in Getting started with CodePipeline.

Topics

- Step 1: Create an S3 source bucket for your application
- Step 2: Create Amazon EC2 Windows instances and install the CodeDeploy agent
- Step 3: Create an application in CodeDeploy
- Step 4: Create your first pipeline in CodePipeline
- (Optional) Step 5: Add another stage to your pipeline
- (Optional) Step 6: Disable and enable transitions between stages in CodePipeline
- Step 7: Clean up resources

Step 1: Create an S3 source bucket for your application

You can store your source files or applications in any versioned location. In this tutorial, you create an S3 bucket for the sample application files and enable versioning on that bucket. After you have enabled versioning, you copy the sample applications to that bucket.

To create an S3 bucket

- 1. Sign in to the console at Amazon Web Services Management Console. Open the S3 console.
- 2. Choose **Create bucket**.
- In Bucket name, enter a name for your bucket (for example, awscodepipelinedemobucket-example-date).

Note

Because all bucket names in Amazon S3 must be unique, use one of your own, not the name shown in the example. You can change the example name just by adding the date to it. Make a note of this name because you need it for the rest of this tutorial.

In **Region**, choose the Region where you intend to create your pipeline, such as **US West** (Oregon), and then choose Create bucket.

- 4. After the bucket is created, a success banner displays. Choose **Go to bucket details**.
- 5. On the **Properties** tab, choose **Versioning**. Choose **Enable versioning**, and then choose **Save**.

When versioning is enabled, Amazon S3 saves every version of every object in the bucket.

- 6. On the **Permissions** tab, leave the defaults. For more information about S3 bucket and object permissions, see <u>Specifying Permissions in a Policy</u>.
- 7. Next, download a sample and save it into a folder or directory on your local computer.
 - a. Choose one of the following. Choose SampleApp_Windows.zip if you want to follow the steps in this tutorial for Windows Server instances.
 - If you want to deploy to Amazon Linux instances using CodeDeploy, download the sample application here: <u>SampleApp_Linux.zip</u>.
 - If you want to deploy to Windows Server instances using CodeDeploy, download the sample application here: <u>SampleApp_Windows.zip</u>.

The sample application contains the following files for deploying with CodeDeploy:

- appspec.yml The application specification file (AppSpec file) is a <u>YAML</u>-formatted file used by CodeDeploy to manage a deployment. For more information about the AppSpec file, see <u>CodeDeploy AppSpec File reference</u> in the *Amazon CodeDeploy User Guide*.
- index.html The index file contains the home page for the deployed sample application.
- LICENSE.txt The license file contains license information for the sample application.
- Files for scripts The sample application uses scripts to write text files to a location on your instance. One file is written for each of several CodeDeploy deployment lifecycle events as follows:
 - (Linux sample only) scripts folder The folder contains the following shell scripts to install dependencies and start and stop the sample application for the automated deployment: install_dependencies, start_server, and stop_server.

- (Windows sample only) before-install.bat This is a batch script for the BeforeInstall deployment lifecycle event, which will run to remove old files written during previous deployments of this sample and create a location on your instance to which to write the new files.
- b. Download the compressed (zipped) file. Do not unzip the file.
- 8. In the Amazon S3 console, for your bucket, upload the file:
 - a. Choose **Upload**.
 - b. Drag and drop the file or choose **Add files** and browse for the file.
 - c. Choose Upload.

Step 2: Create Amazon EC2 Windows instances and install the CodeDeploy agent

🚯 Note

This tutorial provides sample steps for creating Amazon EC2 Windows instances. For sample steps to create Amazon EC2 Linux instances, see <u>Step 3: Create an Amazon EC2</u> <u>Linux instance and install the CodeDeploy agent</u>. When prompted for the number of instances to create, specify **2** instances.

In this step, you create the Windows Server Amazon EC2 instances to which you will deploy a sample application. As part of this process, you create an instance role with policies that allow install and management of the CodeDeploy agent on the instances. The CodeDeploy agent is a software package that enables an instance to be used in CodeDeploy deployments. You also attach policies that allow the instance to fetch files that the CodeDeploy agent uses to deploy your application and to allow the instance to be managed by SSM.

To create an instance role

- 1. Open the IAM console at <u>https://console.amazonaws.cn/iam/</u>).
- 2. From the console dashboard, choose **Roles**.
- 3. Choose Create role.

- 4. Under Select type of trusted entity, select Amazon Web Services service. Under Choose a use case, select EC2, and then choose Next: Permissions.
- 5. Search for and select the policy named AmazonEC2RoleforAWSCodeDeploy.
- Search for and select the policy named AmazonSSMManagedInstanceCore. Choose Next: Tags.
- 7. Choose **Next: Review**. Enter a name for the role (for example, **EC2InstanceRole**).

i Note

Make a note of your role name for the next step. You choose this role when you are creating your instance.

Choose Create role.

To launch instances

- 1. Open the Amazon EC2 console at https://console.amazonaws.cn/ec2/.
- 2. From the side navigation, choose **Instances**, and select **Launch instances** from the top of the page.
- 3. Under Name and tags, in Name, enter MyCodePipelineDemo. This assigns the instances a tag Key of Name and a tag Value of MyCodePipelineDemo. Later, you create a CodeDeploy application that deploys the sample application to the instances. CodeDeploy selects instances to deploy based on the tags.
- Under Application and OS Images (Amazon Machine Image), choose the Windows option. (This AMI is described as the Microsoft Windows Server 2019 Base and is labeled "Free tier eligible" and can be found under Quick Start..)
- 5. Under **Instance type**, choose the free tier eligible t2.micro type as the hardware configuration for your instance.
- 6. Under **Key pair (login)**, choose a key pair or create one.

You can also choose Proceed without a key pair.

🚯 Note

For the purposes of this tutorial, you can proceed without a key pair. To use SSH to connect to your instances, create or use a key pair.

7. Under **Network settings**, do the following.

In Auto-assign Public IP, make sure the status is Enable.

- Next to Assign a security group, choose Create a new security group.
- In the row for SSH, under Source type, choose My IP.
- Choose Add security group, choose HTTP, and then under Source type, choose My IP.
- 8. Expand **Advanced details**. In **IAM instance profile**, choose the IAM role you created in the previous procedure (for example, **EC2InstanceRole**).
- 9. Under Summary, under Number of instances, enter 2..
- 10. Choose Launch instance.
- 11. Choose **View all instances** to close the confirmation page and return to the console.
- 12. You can view the status of the launch on the **Instances** page. When you launch an instance, its initial state is pending. After the instance starts, its state changes to running, and it receives a public DNS name. (If the **Public DNS** column is not displayed, choose the **Show/Hide** icon, and then select **Public DNS**.)
- 13. It can take a few minutes for the instance to be ready for you to connect to it. Check that your instance has passed its status checks. You can view this information in the **Status Checks** column.

Step 3: Create an application in CodeDeploy

In CodeDeploy, an *application* is an identifier, in the form of a name, for the code you want to deploy. CodeDeploy uses this name to ensure the correct combination of revision, deployment configuration, and deployment group are referenced during a deployment. You select the name of the CodeDeploy application you create in this step when you create your pipeline later in this tutorial.

You first create a service role for CodeDeploy to use. If you have already created a service role, you do not need to create another one.

To create a CodeDeploy service role

- 1. Open the IAM console at https://console.amazonaws.cn/iam/).
- 2. From the console dashboard, choose Roles.
- 3. Choose **Create role**.
- 4. Under Select trusted entity, choose Amazon Web Services service. Under Use case, choose CodeDeploy. Choose CodeDeploy from the options listed. Choose Next. The AWSCodeDeployRole managed policy is already attached to the role.
- 5. Choose **Next**.
- 6. Enter a name for the role (for example, **CodeDeployRole**), and then choose **Create role**.

To create an application in CodeDeploy

- 1. Open the CodeDeploy console at https://console.www.amazonaws.cn/codedeploy.
- 2. If the **Applications** page does not appear, on the Amazon CodeDeploy menu, choose **Applications**.
- 3. Choose **Create application**.
- 4. In **Application name**, enter MyDemoApplication.
- 5. In **Compute Platform**, choose **EC2/On-premises**.
- 6. Choose **Create application**.

To create a deployment group in CodeDeploy

- 1. On the page that displays your application, choose **Create deployment group**.
- 2. In **Deployment group name**, enter **MyDemoDeploymentGroup**.
- In Service role, choose the service role you created earlier. You must use a service role that trusts Amazon CodeDeploy with, at minimum, the trust and permissions described in <u>Create</u> <u>a Service Role for CodeDeploy</u>. To get the service role ARN, see <u>Get the Service Role ARN</u> (Console).
- 4. Under **Deployment type**, choose **In-place**.
- 5. Under **Environment configuration**, choose **Amazon EC2 Instances**. Choose **Name** in the **Key** field, and in the **Value** field, enter **MyCodePipelineDemo**.

🔥 Important

You must choose the same value for the **Name** key here that you assigned to your EC2 instances when you created them. If you tagged your instances with something other than **MyCodePipelineDemo**, be sure to use it here.

- 6. Under Agent configuration with Amazon Systems Manager, choose Now and schedule updates. This installs the agent on the instance. The Windows instance is already configured with the SSM agent and will now be updated with the CodeDeploy agent.
- 7. Under **Deployment settings**, choose CodeDeployDefault.OneAtaTime.
- 8. Under **Load Balancer**, make sure the **Enable load balancing** box is not selected. You do not need to set up a load balancer or choose a target group for this example. After you de-select the checkbox, the load balancer options do not display.
- 9. In the **Advanced** section, leave the defaults.
- 10. Choose Create deployment group.

Step 4: Create your first pipeline in CodePipeline

In this part of the tutorial, you create the pipeline. The sample runs automatically through the pipeline.

To create a CodePipeline automated release process

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyFirstPipeline.

🚺 Note

If you choose another name for your pipeline, be sure to use that name instead of **MyFirstPipeline** for the rest of this tutorial. After you create a pipeline, you cannot

change its name. Pipeline names are subject to some limitations. For more information, see <u>Quotas in Amazon CodePipeline</u>.

- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, do one of the following:
 - Choose New service role to allow CodePipeline to create a new service role in IAM.
 - Choose **Existing service role** to use a service role already created in IAM. In **Role name**, choose your service role from the list.
- 7. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 8. In Step 3: Add source stage, in Source provider, choose Amazon S3. In Bucket, enter the name of the S3 bucket you created in <u>Step 1: Create an S3 source bucket for your application</u>. In S3 object key, enter the object key with or without a file path, and remember to include the file extension. For example, for SampleApp_Windows.zip, enter the sample file name as shown in this example:

SampleApp_Windows.zip

Choose Next step.

Under **Change detection options**, leave the defaults. This allows CodePipeline to use Amazon CloudWatch Events to detect changes in your source bucket.

Choose Next.

- 9. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

11. In **Step 6: Add deploy stage**, in **Deploy provider**, choose **CodeDeploy**. The **Region** field defaults to the same Amazon Web Services Region as your pipeline. In **Application name**, enter MyDemoApplication, or choose the **Refresh** button, and then choose the application

name from the list. In **Deployment group**, enter **MyDemoDeploymentGroup**, or choose it from the list, and then choose **Next**.

🚯 Note

The name Deploy is the name given by default to the stage created in the **Step 4: Add deploy stage** step, just as Source is the name given to the first stage of the pipeline.

- 12. In **Step 7: Review**, review the information, and then choose **Create pipeline**.
- 13. The pipeline starts to run. You can view progress and success and failure messages as the CodePipeline sample deploys a webpage to each of the Amazon EC2 instances in the CodeDeploy deployment.

Congratulations! You just created a simple pipeline in CodePipeline. The pipeline has two stages:

- A source stage named **Source**, which detects changes in the versioned sample application stored in the S3 bucket and pulls those changes into the pipeline.
- A **Deploy** stage that deploys those changes to EC2 instances with CodeDeploy.

Now, verify the results.

To verify your pipeline ran successfully

- View the initial progress of the pipeline. The status of each stage changes from No executions yet to In Progress, and then to either Succeeded or Failed. The pipeline should complete the first run within a few minutes.
- 2. After **Succeeded** is displayed for the action status, in the status area for the **Deploy** stage, choose **Details**. This opens the CodeDeploy console.
- 3. In the **Deployment group** tab, under **Deployment lifecycle events**, choose an instance ID. This opens the EC2 console.
- 4. On the **Description** tab, in **Public DNS**, copy the address, and then paste it into the address bar of your web browser. View the index page for the sample application you uploaded to your S3 bucket.

The web page displays for the sample application you uploaded to your S3 bucket.

For more information about stages, actions, and how pipelines work, see CodePipeline concepts.

(Optional) Step 5: Add another stage to your pipeline

Now add another stage in the pipeline to deploy from staging servers to production servers using CodeDeploy. First, you create another deployment group in the CodePipelineDemoApplication in CodeDeploy. Then you add a stage that includes an action that uses this deployment group. To add another stage, you use the CodePipeline console or the Amazon CLI to retrieve and manually edit the structure of the pipeline in a JSON file, and then run the **update-pipeline** command to update the pipeline with your changes.

Topics

- Create a second deployment group in CodeDeploy
- Add the deployment group as another stage in your pipeline

Create a second deployment group in CodeDeploy

🚯 Note

In this part of the tutorial, you create a second deployment group, but deploy to the same Amazon EC2 instances as before. This is for demonstration purposes only. It is purposely designed to fail to show you how errors are displayed in CodePipeline.

To create a second deployment group in CodeDeploy

- 1. Open the CodeDeploy console at https://console.www.amazonaws.cn/codedeploy.
- 2. Choose **Applications**, and in the list of applications, choose MyDemoApplication.
- 3. Choose the **Deployment groups** tab, and then choose **Create deployment group**.
- 4. On the **Create deployment group** page, in **Deployment group name**, enter a name for the second deployment group (for example, **CodePipelineProductionFleet**).
- 5. In **Service Role**, choose the same CodeDeploy service role you used for the initial deployment (not the CodePipeline service role).
- 6. Under **Deployment type**, choose **In-place**.

- 7. Under Environment configuration, choose Amazon EC2 Instances. Choose Name in the Key box, and in the Value box, choose MyCodePipelineDemo from the list. Leave the default configuration for Deployment settings.
- 8. Under **Deployment configuration**, choose CodeDeployDefault.OneAtaTime.
- 9. Under Load Balancer, clear Enable load balancing.
- 10. Choose **Create deployment group**.

Add the deployment group as another stage in your pipeline

Now that you have another deployment group, you can add a stage that uses this deployment group to deploy to the same EC2 instances you used earlier. You can use the CodePipeline console or the Amazon CLI to add this stage.

Topics

- Create a third stage (console)
- Create a third stage (CLI)

Create a third stage (console)

You can use the CodePipeline console to add a new stage that uses the new deployment group. Because this deployment group is deploying to the EC2 instances you've already used, the deploy action in this stage fails.

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. In **Name**, choose the name of the pipeline you created, MyFirstPipeline.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose **+ Add stage** to add a stage immediately after the Deploy stage.

eveloper Tools > CodePipeline > Editing: MyFirstPipe		tPipeline > Edit MyFirstPipeline	Delete Cancel Save
5 5 1			
Edit: Source			Edit stage
Source S3	٤		
		+ Add stage	
Edit: Deploy			Edit stage
Deploy CodeDeploy	٩		4
		+ Add stage	-

- 5. In Add stage, in Stage name, enter **Production**. Choose Add stage.
- 6. In the new stage, choose + Add action group.
- 7. In Edit action, in Action name, enter Deploy-Second-Deployment. In Action provider, under Deploy, choose CodeDeploy.
- 8. In the CodeDeploy section, in **Application name**, choose MyDemoApplication from the drop-down list, as you did when you created the pipeline. In **Deployment group**, choose the deployment group you just created, **CodePipelineProductionFleet**. In **Input artifacts**, choose the input artifact from the source action. Choose **Save**.
- 9. On the Edit page, choose Save. In Save pipeline changes, choose Save.
- 10. Although the new stage has been added to your pipeline, a status of No executions yet is displayed because no changes have triggered another run of the pipeline. You must manually rerun the last revision to see how the edited pipeline runs. On the pipeline details page, choose Release change, and then choose Release when prompted. This runs the most recent revision available in each source location specified in a source action through the pipeline.

Alternatively, to use the Amazon CLI to rerun the pipeline, from a terminal on your local Linux, OS X, or Unix machine, or a command prompt on your local Windows machine, run the **start-pipeline-execution** command, specifying the name of the pipeline. This runs the application in your source bucket through the pipeline for a second time.

aws codepipeline start-pipeline-execution --name MyFirstPipeline

This command returns a pipelineExecutionId object.

11. Return to the CodePipeline console and in the list of pipelines, choose **MyFirstPipeline** to open the view page.

The pipeline shows three stages and the state of the artifact running through those three stages. It might take up to five minutes for the pipeline to run through all stages. You see the deployment succeeds on the first two stages, just as before, but the **Production** stage shows the **Deploy-Second-Deployment** action failed.

12. In the **Deploy-Second-Deployment** action, choose **Details**. You are redirected to the page for the CodeDeploy deployment. In this case, the failure is the result of the first instance group deploying to all of the EC2 instances, leaving no instances for the second deployment group.

i Note

This failure is by design, to demonstrate what happens when there is a failure in a pipeline stage.

Create a third stage (CLI)

Although using the Amazon CLI to add a stage to your pipeline is more complex than using the console, it provides more visibility into the structure of the pipeline.

To create a third stage for your pipeline

1. Open a terminal session on your local Linux, OS X, or Unix machine, or a command prompt on your local Windows machine, and run the **get-pipeline** command to display the structure of the pipeline you just created. For **MyFirstPipeline**, you would type the following command:

aws codepipeline get-pipeline --name "MyFirstPipeline"

This command returns the structure of MyFirstPipeline. The first part of the output should look similar to the following:

```
"pipeline": {
    "roleArn": "arn:aws:iam::80398EXAMPLE:role/AWS-CodePipeline-Service",
    "stages": [
...
```

The final part of the output includes the pipeline metadata and should look similar to the following:

```
. . .
        ],
        "artifactStore": {
            "type": "S3"
            "location": "amzn-s3-demo-bucket",
        },
        "name": "MyFirstPipeline",
        "version": 4
    },
    "metadata": {
        "pipelineArn": "arn:aws:codepipeline:us-
east-2:80398EXAMPLE:MyFirstPipeline",
        "updated": 1501626591.112,
        "created": 1501626591.112
    }
}
```

Copy and paste this structure into a plain-text editor, and save the file as pipeline.json.
 For convenience, save this file in the same directory where you run the aws codepipeline commands.

🚯 Note

You can pipe the JSON directly into a file with the **get-pipeline** command as follows:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

- 3. Copy the **Deploy** stage section and paste it after the first two stages. Because it is a deploy stage, just like the **Deploy** stage, you use it as a template for the third stage.
- 4. Change the name of the stage and the deployment group details.

The following example shows the JSON you add to the pipeline.json file after the **Deploy** stage. Edit the emphasized elements with new values. Remember to include a comma to separate the **Deploy** and **Production** stage definitions.

```
{
    "name": "Production",
     "actions": [
        {
         "inputArtifacts": [
             {
              "name": "MyApp"
             }
           ],
          "name": "Deploy-Second-Deployment",
          "actionTypeId": {
              "category": "Deploy",
              "owner": "AWS",
              "version": "1",
              "provider": "CodeDeploy"
              },
         "outputArtifacts": [],
         "configuration": {
              "ApplicationName": "CodePipelineDemoApplication",
              "DeploymentGroupName": "CodePipelineProductionFleet"
               },
         "runOrder": 1
        }
    ]
}
```

5. If you are working with the pipeline structure retrieved using the get-pipeline command, you must remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
```

```
"updated": "date"
}
```

Save the file.

6. Run the **update-pipeline** command, specifying the pipeline JSON file, similar to the following:

```
aws codepipeline update-pipeline --cli-input-json file://pipeline.json
```

This command returns the entire structure of the updated pipeline.

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

7. Run the **start-pipeline-execution** command, specifying the name of the pipeline. This runs the application in your source bucket through the pipeline for a second time.

aws codepipeline start-pipeline-execution --name MyFirstPipeline

This command returns a pipelineExecutionId object.

8. Open the CodePipeline console and choose **MyFirstPipeline** from the list of pipelines.

The pipeline shows three stages and the state of the artifact running through those three stages. It might take up to five minutes for the pipeline to run through all stages. Although the deployment succeeds on the first two stages, just as before, the **Production** stage shows that the **Deploy-Second-Deployment** action failed.

9. In the **Deploy-Second-Deployment** action, choose **Details** to see details of the failure. You are redirected to the details page for the CodeDeploy deployment. In this case, the failure is the result of the first instance group deploying to all of the EC2 instances, leaving no instances for the second deployment group.

🚯 Note

This failure is by design, to demonstrate what happens when there is a failure in a pipeline stage.

(Optional) Step 6: Disable and enable transitions between stages in CodePipeline

You can enable or disable the transition between stages in a pipeline. Disabling the transition between stages allows you to manually control transitions between one stage and another. For example, you might want to run the first two stages of a pipeline, but disable transitions to the third stage until you are ready to deploy to production, or while you troubleshoot a problem or failure with that stage.

To disable and enable transitions between stages in a CodePipeline pipeline

- 1. Open the CodePipeline console and choose **MyFirstPipeline** from the list of pipelines.
- 2. On the details page for the pipeline, choose the **Disable transition** button between the second stage (**Deploy**) and the third stage that you added in the previous section (**Production**).
- 3. In **Disable transition**, enter a reason for disabling the transition between the stages, and then choose **Disable**.

The arrow between stages displays an icon and color change, and the **Enable transition** button.

Disable transition	×
You are about to disable the transition between "Source" and "Production".	
Disabling reason Explain why you are disabling the transition.	
Disabling transition while I troubleshoot the failure	
Cancel	Disable

- 4. Upload your sample again to the S3 bucket. Because the bucket is versioned, this change starts the pipeline.
- 5. Return to the details page for your pipeline and watch the status of the stages. The pipeline view changes to show progress and success on the first two stages, but no changes occur on the third stage. This process might take a few minutes.
- 6. Enable the transition by choosing the **Enable transition** button between the two stages. In the **Enable transition** dialog box, choose **Enable**. The stage starts running in a few minutes and attempts to process the artifact that has already been run through the first two stages of the pipeline.

🚯 Note

If you want this third stage to succeed, edit the CodePipelineProductionFleet deployment group before you enable the transition, and specify a different set of EC2 instances where the application is deployed. For more information about how to do this, see <u>Change deployment group settings</u>. If you create more EC2 instances, you might incur additional costs.

Step 7: Clean up resources

You can use some of the resources you created in this tutorial for the <u>Tutorial: Create a four-</u><u>stage pipeline</u>. For example, you can reuse the CodeDeploy application and deployment. You can configure a build action with a provider such as CodeBuild, which is a fully managed build service in the cloud. You can also configure a build action that uses a provider with a build server or system, such as Jenkins.

However, after you complete this and any other tutorials, you should delete the pipeline and the resources it uses, so that you are not charged for the continued use of those resources. First, delete the pipeline, then the CodeDeploy application and its associated Amazon EC2 instances, and finally, the S3 bucket.

To clean up the resources used in this tutorial

- 1. To clean up your CodePipeline resources, follow the instructions in <u>Delete a pipeline in Amazon</u> <u>CodePipeline</u>.
- 2. To clean up your CodeDeploy resources, follow the instructions in <u>To clean up resources</u> (console).
- 3. To delete the S3 bucket, follow the instructions in <u>Deleting or emptying a bucket</u>. If you do not intend to create more pipelines, delete the S3 bucket created for storing your pipeline artifacts. For more information about this bucket, see <u>CodePipeline concepts</u>.

Tutorial: Create a simple pipeline (CodeCommit repository)

In this tutorial, you use CodePipeline to deploy code maintained in a CodeCommit repository to a single Amazon EC2 instance. Your pipeline is triggered when you push a change to the

CodeCommit repository. The pipeline deploys your changes to an Amazon EC2 instance using CodeDeploy as the deployment service.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

The pipeline has two stages:

- A source stage (**Source**) for your CodeCommit source action.
- A deployment stage (**Deploy**) for your CodeDeploy deployment action.

The easiest way to get started with Amazon CodePipeline is to use the **Create Pipeline** wizard in the CodePipeline console.

🚺 Note

Before you begin, make sure you've set up your Git client to work with CodeCommit. For instructions, see Setting up for CodeCommit.

Step 1: Create a CodeCommit repository

First, you create a repository in CodeCommit. Your pipeline gets source code from this repository when it runs. You also create a local repository where you maintain and update code before you push it to the CodeCommit repository.

To create a CodeCommit repository

- 1. Open the CodeCommit console at https://console.amazonaws.cn/codecommit/.
- 2. In the Region selector, choose the Amazon Web Services Region where you want to create the repository and pipeline. For more information, see <u>Amazon Web Services Regions and</u> Endpoints.

- 3. On the **Repositories** page, choose **Create repository**.
- 4. On the **Create repository** page, in **Repository name**, enter a name for your repository (for example, **MyDemoRepo**).
- 5. Choose Create.

Note

The remaining steps in this tutorial use **MyDemoRepo** for the name of your CodeCommit repository. If you choose a different name, be sure to use it throughout this tutorial.

To set up a local repository

In this step, you set up a local repository to connect to your remote CodeCommit repository.

Note

You are not required to set up a local repository. You can also use the console to upload files as described in <u>Step 2: Add sample code to your CodeCommit repository</u>.

- With your new repository open in the console, choose Clone URL on the top right of the page, and then choose Clone SSH. The address to clone your Git repository is copied to your clipboard.
- 2. In your terminal or command line, navigate to a local directory where you'd like your local repository to be stored. In this tutorial, we use /tmp.
- 3. Run the following command to clone the repository, replacing the SSH address with the one you copied in the previous step. This command creates a directory called MyDemoRepo. You copy a sample application to this directory.

git clone ssh://git-codecommit.us-west-2.amazonaws.com/v1/repos/MyDemoRepo

Step 2: Add sample code to your CodeCommit repository

In this step, you download code for a sample application that was created for a CodeDeploy sample walkthrough, and add it to your CodeCommit repository.

- 1. Next, download a sample and save it into a folder or directory on your local computer.
 - a. Choose one of the following. Choose SampleApp_Linux.zip if you want to follow the steps in this tutorial for Linux instances.
 - If you want to deploy to Amazon Linux instances using CodeDeploy, download the sample application here: SampleApp_Linux.zip.
 - If you want to deploy to Windows Server instances using CodeDeploy, download the sample application here: SampleApp_Windows.zip.

The sample application contains the following files for deploying with CodeDeploy:

- appspec.yml The application specification file (AppSpec file) is a <u>YAML</u>-formatted file used by CodeDeploy to manage a deployment. For more information about the AppSpec file, see <u>CodeDeploy AppSpec File reference</u> in the *Amazon CodeDeploy User Guide*.
- index.html The index file contains the home page for the deployed sample application.
- LICENSE.txt The license file contains license information for the sample application.
- Files for scripts The sample application uses scripts to write text files to a location on your instance. One file is written for each of several CodeDeploy deployment lifecycle events as follows:
 - (Linux sample only) scripts folder The folder contains the following shell scripts to install dependencies and start and stop the sample application for the automated deployment: install_dependencies, start_server, and stop_server.
 - (Windows sample only) before-install.bat This is a batch script for the BeforeInstall deployment lifecycle event, which will run to remove old files written during previous deployments of this sample and create a location on your instance to which to write the new files.
- b. Download the compressed (zipped) file.
- 2. Unzip the files from <u>SampleApp_Linux.zip</u> into the local directory you created earlier (for example, /tmp/MyDemoRepo or c:\temp\MyDemoRepo).

Be sure to place the files directly into your local repository. Do not include a SampleApp_Linux folder. On your local Linux, OS X, or Unix machine, for example, your directory and file hierarchy should look like this:

```
/tmp
#-- MyDemoRepo
#-- appspec.yml
#-- index.html
#-- LICENSE.txt
#-- scripts
#-- install_dependencies
#-- start_server
#-- stop_server
```

- 3. To upload files to your repository, use one of the following methods.
 - a. To use the CodeCommit console to upload your files:
 - i. Open the CodeCommit console, and choose your repository from the **Repositories** list.
 - ii. Choose Add file, and then choose Upload file.
 - iii. Select Choose file, and then browse for your file. To add a file under a folder, choose Create file and then enter the folder name with the file name, such as scripts/ install_dependencies. Paste the file contents into the new file.

Commit the change by entering your user name and email address.

Choose **Commit changes**.

iv. Repeat this step for each file.

Your repository contents should look like this:

```
#-- appspec.yml
#-- index.html
#-- LICENSE.txt
#-- scripts
    #-- install_dependencies
    #-- start_server
    #-- stop_server
```

- b. To use git commands to upload your files:
 - i. Change directories to your local repo:

```
(For Linux, OS X, or Unix) cd /tmp/MyDemoRepo
(For Windows) cd c:\temp\MyDemoRepo
```

ii. Run the following command to stage all of your files at once:

```
git add -A
```

iii. Run the following command to commit the files with a commit message:

```
git commit -m "Add sample application files"
```

iv. Run the following command to push the files from your local repo to your CodeCommit repository:

git push

4. The files you downloaded and added to your local repo have now been added to the main branch in your CodeCommit MyDemoRepo repository and are ready to be included in a pipeline.

Step 3: Create an Amazon EC2 Linux instance and install the CodeDeploy agent

In this step, you create the Amazon EC2 instance where you deploy a sample application. As part of this process, create an instance role that allows install and management of the CodeDeploy agent on the instance. The CodeDeploy agent is a software package that enables an instance to be used in CodeDeploy deployments. You also attach policies that allow the instance to fetch files that the CodeDeploy agent uses to deploy your application and to allow the instance to be managed by SSM.

To create an instance role

- 1. Open the IAM console at https://console.amazonaws.cn/iam/).
- 2. From the console dashboard, choose **Roles**.

- 3. Choose **Create role**.
- 4. Under Select type of trusted entity, select Amazon Web Services service. Under Choose a use case, select EC2. Under Select your use case, choose EC2. Choose Next: Permissions.
- 5. Search for and select the policy named **AmazonEC2RoleforAWSCodeDeploy**.
- Search for and select the policy named AmazonSSMManagedInstanceCore. Choose Next: Tags.
- 7. Choose Next: Review. Enter a name for the role (for example, EC2InstanceRole).

Note

Make a note of your role name for the next step. You choose this role when you are creating your instance.

Choose Create role.

To launch an instance

- 1. Open the Amazon EC2 console at https://console.amazonaws.cn/ec2/.
- 2. From the side navigation, choose **Instances**, and select **Launch instances** from the top of the page.
- 3. In Name, enter MyCodePipelineDemo. This assigns the instance a tag Key of Name and a tag Value of MyCodePipelineDemo. Later, you create a CodeDeploy application that deploys the sample application to this instance. CodeDeploy selects instances to deploy based on the tags.
- 4. Under **Application and OS Images (Amazon Machine Image)**, locate the **Amazon Linux** AMI option with the Amazon logo, and make sure it is selected. (This AMI is described as the Amazon Linux 2 AMI (HVM) and is labeled "Free tier eligible".)
- 5. Under **Instance type**, choose the free tier eligible t2.micro type as the hardware configuration for your instance.
- 6. Under **Key pair (login)**, choose a key pair or create one.

You can also choose Proceed without a key pair.

🚯 Note

For the purposes of this tutorial, you can proceed without a key pair. To use SSH to connect to your instances, create or use a key pair.

7. Under **Network settings**, do the following.

In Auto-assign Public IP, make sure the status is Enable.

For the created security group, choose **HTTP**, and then under **Source type**, choose **My IP**.

- 8. Expand **Advanced details**. In **IAM instance profile**, choose the IAM role you created in the previous procedure (for example, **EC2InstanceRole**).
- 9. Under Summary, under Number of instances, enter 1..
- 10. Choose Launch instance.
- 11. You can view the status of the launch on the **Instances** page. When you launch an instance, its initial state is pending. After the instance starts, its state changes to running, and it receives a public DNS name. (If the **Public DNS** column is not displayed, choose the **Show/Hide** icon, and then select **Public DNS**.)

Step 4: Create an application in CodeDeploy

In CodeDeploy, an *application* is a resource that contains the software application you want to deploy. Later, you use this application with CodePipeline to automate deployments of the sample application to your Amazon EC2 instance.

First, you create a role that allows CodeDeploy to perform deployments. Then, you create a CodeDeploy application.

To create a CodeDeploy service role

- 1. Open the IAM console at https://console.amazonaws.cn/iam/).
- 2. From the console dashboard, choose **Roles**.
- 3. Choose Create role.
- 4. Under Select trusted entity, choose Amazon Web Services service. Under Use case, choose CodeDeploy. Choose CodeDeploy from the options listed. Choose Next. The AWSCodeDeployRole managed policy is already attached to the role.

- 5. Choose Next.
- 6. Enter a name for the role (for example, **CodeDeployRole**), and then choose **Create role**.

To create an application in CodeDeploy

- 1. Open the CodeDeploy console at https://console.www.amazonaws.cn/codedeploy.
- 2. If the **Applications** page does not appear, on the menu, choose **Applications**.
- 3. Choose Create application.
- 4. In Application name, enter MyDemoApplication.
- 5. In **Compute Platform**, choose **EC2/On-premises**.
- 6. Choose **Create application**.

To create a deployment group in CodeDeploy

A <u>deployment group</u> is a resource that defines deployment-related settings like which instances to deploy to and how fast to deploy them.

- 1. On the page that displays your application, choose **Create deployment group**.
- 2. In **Deployment group name**, enter **MyDemoDeploymentGroup**.
- 3. In Service role, choose the ARN of the service role you created earlier (for example, arn:aws:iam::account_ID:role/CodeDeployRole).
- 4. Under **Deployment type**, choose **In-place**.
- Under Environment configuration, choose Amazon EC2 Instances. In the Key field, enter Name. In the Value field, enter the name you used to tag the instance (for example, MyCodePipelineDemo).
- 6. Under Agent configuration with Amazon Systems Manager, choose Now and schedule updates. This installs the agent on the instance. The Linux instance is already configured with the SSM agent and will now be updated with the CodeDeploy agent.
- 7. Under **Deployment configuration**, choose CodeDeployDefault.OneAtaTime.
- 8. Under **Load Balancer**, make sure **Enable load balancing** is not selected. You do not need to set up a load balancer or choose a target group for this example.
- 9. Choose Create deployment group.

Step 5: Create your first pipeline in CodePipeline

You're now ready to create and run your first pipeline. In this step, you create a pipeline that runs automatically when code is pushed to your CodeCommit repository.

To create a CodePipeline pipeline

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyFirstPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
- 7. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- In Step 3: Add source stage, in Source provider, choose CodeCommit. In Repository name, choose the name of the CodeCommit repository you created in <u>Step 1: Create a CodeCommit</u> repository. In Branch name, choose main, and then choose Next step.

After you select the repository name and branch, a message displays the Amazon CloudWatch Events rule to be created for this pipeline.

Under **Change detection options**, leave the defaults. This allows CodePipeline to use Amazon CloudWatch Events to detect changes in your source repository.

Choose Next.

9. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.

🚯 Note

In this tutorial, you are deploying code that requires no build service, so you can skip this step. However, if your source code needs to be built before it is deployed to instances, you can configure CodeBuild in this step.

10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. In Step 6: Add deploy stage, in Deploy provider, choose CodeDeploy. In Application name, choose MyDemoApplication. In Deployment group, choose MyDemoDeploymentGroup, and then choose Next step.
- 12. In Step 7: Review, review the information, and then choose Create pipeline.
- 13. The pipeline starts running after it is created. It downloads the code from your CodeCommit repository and creates a CodeDeploy deployment to your EC2 instance. You can view progress and success and failure messages as the CodePipeline sample deploys the webpage to the Amazon EC2 instance in the CodeDeploy deployment.

veloper Tools > CodePipe	eline > Pipelines > AnyCo	ompanyPipeline	
nyCompanyPi	peline	Edit View history Release of	hange
c Source		View current revisi	ons
Source CodeCommit C In progress - Just now	٥		
Disable transition			
⊖ Deploy		View current revisi	ons
Deploy CodeDeploy Didn't Run	٥		

Congratulations! You just created a simple pipeline in CodePipeline.

Next, you verify the results.

To verify that your pipeline ran successfully

- View the initial progress of the pipeline. The status of each stage changes from No executions yet to In Progress, and then to either Succeeded or Failed. The pipeline should complete the first run within a few minutes.
- 2. After **Succeeded** is displayed for the pipeline status, in the status area for the **Deploy** stage, choose **CodeDeploy**. This opens the CodeDeploy console. If **Succeeded** is not displayed see <u>Troubleshooting CodePipeline</u>.
- 3. On the **Deployments** tab, choose the deployment ID. On the page for the deployment, under **Deployment lifecycle events**, choose the instance ID. This opens the EC2 console.
- 4. On the **Description** tab, in **Public DNS**, copy the address (for example, ec2-192-0-2-1.uswest-2.compute.amazonaws.com), and then paste it into the address bar of your web browser.

The web page displays for the sample application you downloaded and pushed to your CodeCommit repository.

For more information about stages, actions, and how pipelines work, see CodePipeline concepts.

Step 6: Modify code in your CodeCommit repository

Your pipeline is configured to run whenever code changes are made to your CodeCommit repository. In this step, you make changes to the HTML file that is part of the sample CodeDeploy application in the CodeCommit repository. When you push these changes, your pipeline runs again, and the changes you make are visible at the web address you accessed earlier.

1. Change directories to your local repo:

```
(For Linux, OS X, or Unix) cd /tmp/MyDemoRepo
(For Windows) cd c:\temp\MyDemoRepo
```

2. Use a text editor to modify the index.html file:

```
(For Linux or Unix)gedit index.html
(For OS X)open -e index.html
```

```
(For Windows) notepad index.html
```

3. Revise the contents of the index.html file to change the background color and some of the text on the webpage, and then save the file.

```
<!DOCTYPE html>
<html>
<head>
  <title>Updated Sample Deployment</title>
  <style>
    body {
     color: #000000;
     background-color: #CCFFCC;
     font-family: Arial, sans-serif;
     font-size:14px;
    }
   h1 {
     font-size: 250%;
     font-weight: normal;
     margin-bottom: 0;
   }
   h2 {
     font-size: 175%;
     font-weight: normal;
     margin-bottom: 0;
    }
  </style>
</head>
<body>
  <div align="center"><h1>Updated Sample Deployment</h1></div>
  <div align="center"><h2>This application was updated using CodePipeline,
CodeCommit, and CodeDeploy.</h2></div>
  <div align="center">
    Learn more:
    <a href="https://docs.amazonaws.cn/codepipeline/latest/</p>
userguide/">CodePipeline User Guide</a>
    <a href="https://docs.amazonaws.cn/codecommit/latest/userguide/">CodeCommit</a>
User Guide</a>
    <a href="https://docs.amazonaws.cn/codedeploy/latest/userguide/">CodeDeploy
User Guide</a>
  </div>
```

```
</body>
</html>
```

4. Commit and push your changes to your CodeCommit repository by running the following commands, one at a time:

git commit -am "Updated sample application files"

git push

To verify your pipeline ran successfully

- View the initial progress of the pipeline. The status of each stage changes from No executions yet to In Progress, and then to either Succeeded or Failed. The running of the pipeline should be complete within a few minutes.
- 2. After **Succeeded** is displayed for the action status, refresh the demo page you accessed earlier in your browser.

The updated webpage is displayed.

Step 7: Clean up resources

You can use some of the resources you created in this tutorial for other tutorials in this guide. For example, you can reuse the CodeDeploy application and deployment. However, after you complete this and any other tutorials, you should delete the pipeline and the resources it uses so that you are not charged for the continued use of those resources. First, delete the pipeline, then the CodeDeploy application and its associated Amazon EC2 instance, and finally, the CodeCommit repository.

To clean up the resources used in this tutorial

- 1. To clean up your CodePipeline resources, follow the instructions in <u>Delete a pipeline in Amazon</u> CodePipeline.
- 2. To clean up your CodeDeploy resources, follow the instructions in <u>Clean Up Deployment</u> Walkthrough Resources.
- 3. To delete the CodeCommit repository, follow the instructions in <u>Delete a CodeCommit</u> repository.

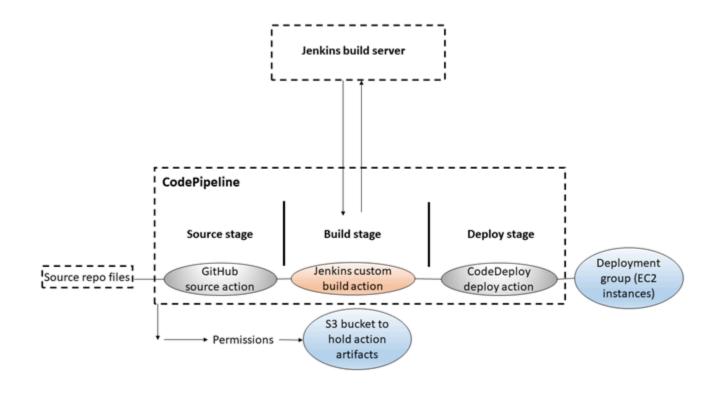
Step 8: Further reading

Learn more about how CodePipeline works:

- For more information about stages, actions, and how pipelines work, see CodePipeline concepts.
- For information about the actions you can perform using CodePipeline, see <u>Integrations with</u> <u>CodePipeline action types</u>.
- Try this more advanced tutorial, <u>Tutorial: Create a four-stage pipeline</u>. It creates a multi-stage pipeline that includes a step that builds code before it's deployed.

Tutorial: Create a four-stage pipeline

Now that you've created your first pipeline in <u>Tutorial: Create a simple pipeline (S3 bucket)</u> or <u>Tutorial: Create a simple pipeline (CodeCommit repository)</u>, you can start creating more complex pipelines. This tutorial will walk you through the creation of a four-stage pipeline that uses a GitHub repository for your source, a Jenkins build server to build the project, and a CodeDeploy application to deploy the built code to a staging server. The following diagram shows the initial three-stage pipeline.



After the pipeline is created, you will edit it to add a stage with a test action to test the code, also using Jenkins.

Before you can create this pipeline, you must configure the required resources. For example, if you want to use a GitHub repository for your source code, you must create the repository before you can add it to a pipeline. As part of setting up, this tutorial walks you through setting up Jenkins on an EC2 instance for demonstration purposes.

A Important

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region.

You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see Add a cross-Region action in CodePipeline.

A Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

Before you begin this tutorial, you should have already completed the general prerequisites in Getting started with CodePipeline.

Topics

- Step 1: Complete prerequisites
- Step 2: Create a pipeline in CodePipeline
- Step 3: Add another stage to your pipeline
- Step 4: Clean up resources

Step 1: Complete prerequisites

To integrate with Jenkins, Amazon CodePipeline requires you to install the CodePipeline Plugin for Jenkins on any instance of Jenkins you want to use with CodePipeline. You should also configure a dedicated IAM user or role to use for permissions between your Jenkins project and CodePipeline. The easiest way to integrate Jenkins and CodePipeline is to install Jenkins on an EC2 instance that uses an IAM instance role that you create for Jenkins integration. In order for links in the pipeline for Jenkins actions to successfully connect, you must configure proxy and firewall settings on the server or EC2 instance to allow inbound connections to the port used by your Jenkins project. Make sure you have configured Jenkins to authenticate users and enforce access control before you allow connections on those ports (for example, 443 and 8443 if you have secured Jenkins to only use HTTPS connections, or 80 and 8080 if you allow HTTP connections). For more information, see Securing Jenkins.

🚯 Note

This tutorial uses a code sample and configures build steps that convert the sample from Haml to HTML. You can download the open-source sample code from the GitHub repository by following the steps in <u>Copy or clone the sample into a GitHub repository</u>. You will need the entire sample in your GitHub repository, not just the .zip file. This tutorial also assumes that:

- You are familiar with installing and administering Jenkins and creating Jenkins projects.
- You have installed Rake and the Haml gem for Ruby on the same computer or instance that hosts your Jenkins project.
- You have set the required system environment variables so that Rake commands can be run from the terminal or command line (for example, on Windows systems, modifying the PATH variable to include the directory where you installed Rake).

Topics

- Copy or clone the sample into a GitHub repository
- Create an IAM role to use for Jenkins integration
- Install and configure Jenkins and the CodePipeline Plugin for Jenkins

Copy or clone the sample into a GitHub repository

To clone the sample and push to a GitHub repository

- 1. Download the sample code from the GitHub repository, or clone the repositories to your local computer. There are two sample packages:
 - If you will be deploying your sample to Amazon Linux, RHEL, or Ubuntu Server instances, choose <u>codepipeline-jenkins-aws-codedeploy_linux.zip</u>.
 - If you will be deploying your sample to Windows Server instances, choose <u>CodePipeline</u>Jenkins-AWSCodeDeploy_Windows.zip.
- From the repository, choose Fork to clone the sample repo into a repo in your Github account.
 For more information, see the <u>GitHub documentation</u>.

Create an IAM role to use for Jenkins integration

As a best practice, consider launching an EC2 instance to host your Jenkins server and using an IAM role to grant the instance the required permissions for interacting with CodePipeline.

- 1. Sign in to the Amazon Web Services Management Console and open the IAM console at https://console.amazonaws.cn/iam/.
- 2. In the IAM console, in the navigation pane, choose **Roles**, and then choose **Create role**.
- 3. Under Select type of trusted entity, choose Amazon Web Services service. Under Choose the service that will use this role, choose EC2. Under Select your use case, choose EC2.
- Choose Next: Permissions. On the Attach permissions policies page, select the AWSCodePipelineCustomActionAccess managed policy, and then choose Next: Tags. Choose Next: Review.
- 5. On the **Review** page, in **Role name**, enter the name of the role to create specifically for Jenkins integration (for example, *JenkinsAccess*), and then choose **Create role**.

When you create the EC2 instance where you will install Jenkins, in **Step 3: Configure Instance Details**, make sure you choose the instance role (for example, *JenkinsAccess*).

For more information about instance roles and Amazon EC2, see <u>IAM roles for Amazon EC2</u>, <u>Using</u> <u>IAM Roles to Grant Permissions to Applications Running on Amazon EC2 Instances</u>, and <u>Creating a</u> role to delegate permissions to an Amazon Web Services service.

Install and configure Jenkins and the CodePipeline Plugin for Jenkins

To install Jenkins and the CodePipeline Plugin for Jenkins

Create an EC2 instance where you will install Jenkins, and in Step 3: Configure Instance
 Details, make sure you choose the instance role you created (for example, JenkinsAccess).

 For more information about creating EC2 instances, see Launch an Amazon EC2 instance in the
 Amazon EC2 User Guide.

🚯 Note

If you already have Jenkins resources you want to use, you can do so, but you must create a special IAM user, apply the AWSCodePipelineCustomActionAccess managed policy to that user, and then configure and use the access credentials for that user on your Jenkins resource. If you want to use the Jenkins UI to supply the credentials, configure Jenkins to only allow HTTPS. For more information, see Troubleshooting CodePipeline.

- Install Jenkins on the EC2 instance. For more information, see the Jenkins documentation for <u>installing Jenkins</u> and <u>starting and accessing Jenkins</u>, as well as <u>details of integration with</u> Jenkins in Product and service integrations with CodePipeline.
- 3. Launch Jenkins, and on the home page, choose Manage Jenkins.
- 4. On the Manage Jenkins page, choose Manage Plugins.
- Choose the Available tab, and in the Filter search box, enter Amazon CodePipeline. Choose CodePipeline Plugin for Jenkins from the list and choose Download now and install after restart.
- 6. On the **Installing Plugins/Upgrades** page, select **Restart Jenkins when installation is complete and no jobs are running**.
- 7. Choose **Back to Dashboard**.
- 8. On the main page, choose **New Item**.
- 9. In **Item Name**, enter a name for the Jenkins project (for example, *MyDemoProject*). Choose **Freestyle project**, and then choose **OK**.

🚯 Note

Make sure that the name for your project meets the requirements for CodePipeline. For more information, see <u>Quotas in Amazon CodePipeline</u>.

- 10. On the configuration page for the project, select the **Execute concurrent builds if necessary** check box. In **Source Code Management**, choose **Amazon CodePipeline**. If you have installed Jenkins on an EC2 instance and configured the Amazon CLI with the profile for the IAM user you created for integration between CodePipeline and Jenkins, leave all of the other fields empty.
- 11. Choose **Advanced**, and in **Provider**, enter a name for the provider of the action as it will appear in CodePipeline (for example, *MyJenkinsProviderName*). Make sure that this name is unique and easy to remember. You will use it when you add a build action to your pipeline later in this tutorial, and again when you add a test action.

🚯 Note

This action name must meet the naming requirements for actions in CodePipeline. For more information, see <u>Quotas in Amazon CodePipeline</u>.

12. In **Build Triggers**, clear any check boxes, and then select **Poll SCM**. In **Schedule**, enter five asterisks separated by spaces, as follows:

* * * * *

This polls CodePipeline every minute.

13. In **Build**, choose **Add build step**. Choose **Execute shell** (Amazon Linux, RHEL, or Ubuntu Server) **Execute batch command** (Windows Server), and then enter the following:

rake	
(i) Note	
Make sure that your environment is configured with the variables and settings required	

to run rake; otherwise, the build will fail.

- 14. Choose Add post-build action, and then choose Amazon CodePipeline Publisher. Choose Add, and in Build Output Locations, leave the location blank. This configuration is the default. It will create a compressed file at the end of the build process.
- 15. Choose **Save** to save your Jenkins project.

Step 2: Create a pipeline in CodePipeline

In this part of the tutorial, you create the pipeline using the **Create Pipeline** wizard.

To create a CodePipeline automated release process

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- If necessary, use the Region selector to change the Region to the one where your pipeline resources are located. For example, if you created resources for the previous tutorial in us – east - 2, make sure that the Region selector is set to US East (Ohio).

For more information about the Regions and endpoints available for CodePipeline, see Amazon CodePipeline endpoints and quotas.

- 3. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 4. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 5. On the **Step 2: Choose pipeline settings** page, in **Pipeline name**, enter the name for your pipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 7. In Service role, choose New service role to allow CodePipeline to create a service role in IAM.
- 8. Leave the settings under **Advanced settings** at their defaults, and choose **Next**.
- 9. On the **Step 3: Add source stage** page, in **Source provider**, choose **GitHub**.
- 10. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
- 11. In Step 4: Add build stage, choose Add Jenkins. In Provider name, enter the name of the action you provided in the CodePipeline Plugin for Jenkins (for example MyJenkinsProviderName). This name must exactly match the name in the CodePipeline

Plugin for Jenkins. In **Server URL**, enter the URL of the EC2 instance where Jenkins is installed. In **Project name**, enter the name of the project you created in Jenkins, such as *MyDemoProject*, and then choose **Next**.

12. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

13. In Step 6: Add deploy stage, reuse the CodeDeploy application and deployment group you created in <u>Tutorial: Create a simple pipeline (S3 bucket</u>). In Deploy provider, choose CodeDeploy. In Application name, enter CodePipelineDemoApplication, or choose the refresh button, and then choose the application name from the list. In Deployment group, enter CodePipelineDemoFleet, or choose it from the list, and then choose Next.

🚺 Note

You can use your own CodeDeploy resources or create new ones, but you might incur additional costs.

- 14. In **Step 7: Review**, review the information, and then choose **Create pipeline**.
- 15. The pipeline automatically starts and runs the sample through the pipeline. You can view progress and success and failure messages as the pipeline builds the Haml sample to HTML and deploys it a webpage to each of the Amazon EC2 instances in the CodeDeploy deployment.

Step 3: Add another stage to your pipeline

Now you will add a test stage and then a test action to that stage that uses the Jenkins test included in the sample to determine whether the webpage has any content. This test is for demonstration purposes only.

🚺 Note

If you did not want to add another stage to your pipeline, you could add a test action to the Staging stage of the pipeline, before or after the deployment action.

Add a test stage to your pipeline

Topics

- Look up the IP address of an instance
- Create a Jenkins project for testing the deployment
- Create a fourth stage

Look up the IP address of an instance

To verify the IP address of an instance where you deployed your code

- 1. After **Succeeded** is displayed for the pipeline status, in the status area for the Staging stage, choose **Details**.
- 2. In the **Deployment Details** section, in **Instance ID**, choose the instance ID of one of the successfully deployed instances.
- 3. Copy the IP address of the instance (for example, 192.168.0.4). You will use this IP address in your Jenkins test.

Create a Jenkins project for testing the deployment

To create the Jenkins project

- 1. On the instance where you installed Jenkins, open Jenkins and from the main page, choose **New Item**.
- In Item Name, enter a name for the Jenkins project (for example, *MyTestProject*). Choose Freestyle project, and then choose OK.

🚺 Note

Make sure that the name for your project meets the CodePipeline requirements. For more information, see <u>Quotas in Amazon CodePipeline</u>.

3. On the configuration page for the project, select the **Execute concurrent builds if necessary** check box. In **Source Code Management**, choose **Amazon CodePipeline**. If you have installed Jenkins on an EC2 instance and configured the Amazon CLI with the profile for the IAM user you created for integration between CodePipeline and Jenkins, leave all the other fields empty.

🔥 Important

If you are configuring a Jenkins project and it is not installed on an Amazon EC2 instance, or it is installed on an EC2 instance that is running a Windows operating system, complete the fields as required by your proxy host and port settings, and provide the credentials of the IAM user or role you configured for integration between Jenkins and CodePipeline.

- 4. Choose **Advanced**, and in **Category**, choose **Test**.
- In Provider, enter the same name you used for the build project (for example, MyJenkinsProviderName). You will use this name when you add the test action to your pipeline later in this tutorial.

🚯 Note

This name must meet the CodePipeline naming requirements for actions. For more information, see <u>Quotas in Amazon CodePipeline</u>.

6. In **Build Triggers**, clear any check boxes, and then select **Poll SCM**. In **Schedule**, enter five asterisks separated by spaces, as follows:

* * * * *

This polls CodePipeline every minute.

7. In **Build**, choose **Add build step**. If you are deploying to Amazon Linux, RHEL, or Ubuntu Server instances, choose **Execute shell**. Then enter the following, where the IP address is the address of the EC2 instance you copied earlier:

TEST_IP_ADDRESS=192.168.0.4 rake test

If you are deploying to Windows Server instances, choose **Execute batch command**, and then enter the following, where the IP address is the address of the EC2 instance you copied earlier:

set TEST_IP_ADDRESS=192.168.0.4 rake test

(i) Note

The test assumes a default port of 80. If you want to specify a different port, add a test port statement, as follows:

TEST_IP_ADDRESS=192.168.0.4 TEST_PORT=8000 rake test

- 8. Choose **Add post-build action**, and then choose **Amazon CodePipeline Publisher**. Do not choose **Add**.
- 9. Choose **Save** to save your Jenkins project.

Create a fourth stage

To add a stage to your pipeline that includes the Jenkins test action

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. In **Name**, choose the name of the pipeline you created, MySecondPipeline.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose + **Stage** to add a stage immediately after the Build stage.
- 5. In the name field for the new stage, enter a name (for example, **Testing**), and then choose **+ Add action group**.
- 6. In Action name, enter *MyJenkinsTest-Action*. In **Test provider**, choose the provider name you specified in Jenkins (for example, *MyJenkinsProviderName*). In **Project name**, enter the name of the project you created in Jenkins (for example, *MyTestProject*). In **Input artifacts**, choose the artifact from the Jenkins build whose default name is *BuildArtifact*, and then choose **Done**.

Note

Because the Jenkins test action operates on the application built in the Jenkins build step, use the build artifact for the input artifact to the test action.

For more information about input and output artifacts and the structure of pipelines, see CodePipeline pipeline structure reference.

- 7. On the **Edit** page, choose **Save pipeline changes**. In the **Save pipeline changes** dialog box, choose **Save and continue**.
- 8. Although the new stage has been added to your pipeline, a status of **No executions yet** is displayed for that stage because no changes have triggered another run of the pipeline. To run the sample through the revised pipeline, on the pipeline details page, choose **Release change**.

The pipeline view shows the stages and actions in your pipeline and the state of the revision running through those four stages. The time it takes for the pipeline to run through all stages will depend on the size of the artifacts, the complexity of your build and test actions, and other factors.

Step 4: Clean up resources

After you complete this tutorial, you should delete the pipeline and the resources it uses so you will not be charged for continued use of those resources. If you do not intend to keep using CodePipeline, delete the pipeline, then the CodeDeploy application and its associated Amazon EC2 instances, and finally, the Amazon S3 bucket used to store artifacts. You should also consider whether to delete other resources, such as the GitHub repository, if you do not intend to keep using them.

To clean up the resources used in this tutorial

1. Open a terminal session on your local Linux, OS X, or Unix machine, or a command prompt on your local Windows machine, and run the **delete-pipeline** command to delete the pipeline you created. For **MySecondPipeline**, you would enter the following command:

aws codepipeline delete-pipeline --name "MySecondPipeline"

This command returns nothing.

- 2. To clean up your CodeDeploy resources, follow the instructions in <u>Cleaning Up</u>.
- 3. To clean up your instance resources, delete the EC2 instance where you installed Jenkins. For more information, see <u>Clean up your instance</u>.

- 4. If you do not intend to create more pipelines or use CodePipeline again, delete the Amazon S3 bucket used to store artifacts for your pipeline. To delete the bucket, follow the instructions in Deleting a bucket.
- 5. If you do not intend to use the other resources for this pipeline again, consider deleting them by following the guidance for that particular resource. For example, if you want to delete the GitHub repository, follow the instructions in <u>Deleting a repository</u> on the GitHub website.

Tutorial: Set up a CloudWatch Events rule to receive email notifications for pipeline state changes

After you set up a pipeline in Amazon CodePipeline, you can set up a CloudWatch Events rule to send notifications whenever there are changes to the execution state of your pipelines, or in the stages or actions in your pipelines. For more information on using CloudWatch Events to set up notifications for pipeline state changes, see <u>Monitoring CodePipeline events</u>.

In this tutorial, you configure a notification to send an email when a pipeline's state changes to FAILED. This tutorial uses an input transformer method when creating the CloudWatch Events rule. It transforms the message schema details to deliver the message in human-readable text.

1 Note

As you create the resources for this tutorial, such as the Amazon SNS notification and the CloudWatch Events rule, make sure the resources are created in the same Amazon Region as your pipeline.

Topics

- Step 1: Set up an email notification using Amazon SNS
- Step 2: Create a rule and add the SNS topic as the target
- Step 3: Clean up resources

Step 1: Set up an email notification using Amazon SNS

Amazon SNS coordinates use of topics to deliver messages to subscribing endpoints or clients. Use Amazon SNS to create a notification topic and then subscribe to the topic using your email address. The Amazon SNS topic will be added as a target to your CloudWatch Events rule. For more information, see the Amazon Simple Notification Service Developer Guide .

Create or identify a topic in Amazon SNS. CodePipeline will use CloudWatch Events to send notifications to this topic through Amazon SNS. To create a topic:

- 1. Open the Amazon SNS console at <u>https://console.amazonaws.cn/sns</u>.
- 2. Choose **Create topic**.
- 3. In the **Create new topic** dialog box, for **Topic name**, type a name for the topic (for example, **PipelineNotificationTopic**).

otificationTopic	0
c display name. Required for topics with SMS subscriptions.	0
	c display name. Required for topics with SMS subscriptions.

4. Choose **Create topic**.

For more information, see Create a Topic in the Amazon SNS Developer Guide.

Subscribe one or more recipients to the topic to receive email notifications. To subscribe a recipient to a topic:

- 1. In the Amazon SNS console, from the **Topics** list, select the check box next to your new topic. Choose **Actions, Subscribe to topic**.
- 2. In the **Create subscription** dialog box, verify that an ARN appears in **Topic ARN**.
- 3. For **Protocol**, choose **Email**.
- 4. For **Endpoint**, type the recipient's full email address.
- 5. Choose **Create Subscription**.
- 6. Amazon SNS sends a subscription confirmation email to the recipient. To receive email notifications, the recipient must choose the **Confirm subscription** link in this email. After the recipient clicks the link, if successfully subscribed, Amazon SNS displays a confirmation message in the recipient's web browser.

For more information, see <u>Subscribe to a Topic</u> in the Amazon SNS Developer Guide.

Step 2: Create a rule and add the SNS topic as the target

Create a CloudWatch Events notification rule with CodePipeline as the event source.

- 1. Open the CloudWatch console at https://console.amazonaws.cn/cloudwatch/.
- 2. In the navigation pane, choose **Events**.
- 3. Choose **Create rule**. Under **Event source**, choose **Amazon CodePipeline**. For **Event Type**, choose **Pipeline Execution State Change**.
- 4. Choose **Specific state(s)**, and choose **FAILED**.
- 5. Choose **Edit** to open the JSON editor for the **Event Pattern Preview** pane. Add the **pipeline** parameter with the name of your pipeline as shown in the following example for a pipeline named "myPipeline."

You can copy the event pattern here and paste it into the console:

```
{
  "source": [
    "aws.codepipeline"
  ],
  "detail-type": [
    "CodePipeline Pipeline Execution State Change"
  ],
  "detail": {
    "state": [
      "FAILED"
    ],
    "pipeline": [
      "myPipeline"
    ]
  }
}
```

- 6. For Targets, choose Add target.
- 7. In the list of targets, choose **SNS topic**. For **Topic**, enter the topic you created.
- 8. Expand **Configure input**, and then choose **Input Transformer**.
- 9. In the **Input Path** box, type the following key-value pairs.

{ "pipeline" : "\$.detail.pipeline" }

In the **Input Template** box, type the following:

"The Pipeline <pipeline> has failed."

- 10. Choose **Configure details**.
- 11. On the **Configure rule details** page, type a name and an optional description. For **State**, leave the **Enabled** box selected.
- 12. Choose Create rule.
- 13. Confirm that CodePipeline is now sending build notifications. For example, check to see if the build notification emails are now in your inbox.
- 14. To change a rule's behavior, in the CloudWatch console, choose the rule, and then choose **Actions**, **Edit**. Edit the rule, choose **Configure details**, and then choose **Update rule**.

To stop using a rule to send build notifications, in the CloudWatch console, choose the rule, and then choose **Actions**, **Disable**.

To delete a rule, in the CloudWatch console, choose the rule, and then choose Actions, Delete.

Step 3: Clean up resources

After you complete this tutorial, you should delete the pipeline and the resources it uses so you will not be charged for continued use of those resources.

For information about how to clean up the SNS notification and delete the Amazon CloudWatch Events rule, see <u>Clean Up (Unsubscribe from an Amazon SNS Topic)</u> and reference DeleteRule in the Amazon CloudWatch Events API Reference.

Tutorial: Create a pipeline that builds and tests your Android app with Amazon Device Farm

You can use Amazon CodePipeline to configure a continuous integration flow in which your app is built and tested each time a commit is pushed. This tutorial shows how to create and configure a pipeline to build and test your Android app with source code in a GitHub repository. The pipeline

User Guide

detects the arrival of a new GitHub commit and then uses <u>CodeBuild</u> to build the app and <u>Device</u> <u>Farm</u> to test it.

<u> Important</u>

As part of creating a pipeline in the console, an S3 artifact bucket will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🔥 Important

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region.

You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see <u>Add a cross-Region action in CodePipeline</u>.

You can try this out using your existing Android app and test definitions, or you can use the <u>sample</u> app and test definitions provided by Device Farm.

Note

The CodePipeline action for Device Farm is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Before you begin

1. Sign in to the Amazon Device Farm console and choose **Create a new project**.

- 2. Choose your project. In the browser, copy the URL of your new project. The URL contains the project ID.
- 3. Copy and retain this project ID. You use it when you create your pipeline in CodePipeline.

Here is an example URL for a project. To extract the project ID, copy the value after projects/. In this example, the project ID is eec4905f-98f8-40aa-9afc-4c1cfexample.

```
https://<region-URL>/devicefarm/home?region=us-west-2#/projects/
eec4905f-98f8-40aa-9afc-4c1cfexample/runs
```

Configure CodePipeline to use your Device Farm tests

1.

Add and commit a file called <u>buildspec.yml</u> in the root of your app code, and push it to your repository. CodeBuild uses this file to perform commands and access artifacts required to build your app.

```
version: 0.2
phases:
    build:
        commands:
            - chmod +x ./gradlew
            - ./gradlew assembleDebug
artifacts:
    files:
            - './android/app/build/outputs/**/*.apk'
discard-paths: yes
```

 (Optional) If you <u>use Calabash or Appium to test your app</u>, add the test definition file to your repository. In a later step, you can configure Device Farm to use the definitions to carry out your test suite.

If you use Device Farm built-in tests, you can skip this step.

- 3. To create your pipeline and add a source stage, do the following:
 - a. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

Configure CodePipeline to use your Device Farm tests

- b. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- c. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- d. On the **Step 2: Choose pipeline settings** page, in **Pipeline name**, enter the name for your pipeline.
- e. CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see pipeline types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- f. In **Service role**, leave **New service role** selected, and leave **Role name** unchanged. You can also choose to use an existing service role, if you have one.

🚺 Note

If you use a CodePipeline service role that was created before July 2018, you need to add permissions for Device Farm. To do this, open the IAM console, find the role, and then add the following permissions to the role's policy. For more information, see <u>Add permissions to the CodePipeline service role</u>.

```
{
    "Effect": "Allow",
    "Action": [
        "devicefarm:ListProjects",
        "devicefarm:GetRun",
        "devicefarm:GetUpload",
        "devicefarm:CreateUpload",
        "devicefarm:ScheduleRun"
    ],
    "Resource": "*"
}
```

- g. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- h. On the **Step 3: Add source stage** page, in **Source provider**, choose **GitHub (via GitHub App)**.
- i. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see GitHub connections.

- j. In **Repository**, choose the source repository.
- k. In **Branch**, choose the branch that you want to use.
- l. Leave the remaining defaults for the source action. Choose **Next**.
- 4. In **Step 4: Add build stage**, add a build stage:
 - a. In **Build provider**, choose **Other build providers**, and then choose **Amazon CodeBuild**. Allow **Region** to default to the pipeline Region.
 - b. Choose Create project.
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For Runtime, choose Standard. For Image, choose aws/codebuild/standard:5.0.

CodeBuild uses this OS image, which has Android Studio installed, to build your app.

- f. For **Service role**, choose your existing CodeBuild service role or create a new one.
- g. For **Build specifications**, choose **Use a buildspec file**.
- h. Choose Continue to CodePipeline. This returns to the CodePipeline console and creates a CodeBuild project that uses the buildspec.yml in your repository for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Choose Next.
- 5. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 6. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 7. On **Step 7: Review**, choose **Create pipeline**. You should see a diagram that shows the source and build stages.
- 8. Add a Device Farm test action to your pipeline:
 - a. In the upper right, choose **Edit**.
 - At the bottom of the diagram, choose + Add stage. In Stage name, enter a name, such as Test.

- d. In Action name, enter a name.
- e. In **Action provider**, choose **Amazon Device Farm**. Allow **Region** to default to the pipeline Region.
- f. In **Input artifacts**, choose the input artifact that matches the output artifact of the stage that comes before the test stage, such as BuildArtifact.

In the Amazon CodePipeline console, you can find the name of the output artifact for each stage by hovering over the information icon in the pipeline diagram. If your pipeline tests your app directly from the **Source** stage, choose **SourceArtifact**. If the pipeline includes a **Build** stage, choose **BuildArtifact**.

- g. In **ProjectId**, enter your Device Farm project ID. Use the steps at the start of this tutorial to retrieve your project ID.
- h. In **DevicePoolArn**, enter the ARN for the device pool. To get the available device pool ARNs for the project, including the ARN for Top Devices, use the Amazon CLI to enter the following command:

```
aws devicefarm list-device-pools --arn arn:aws:devicefarm:us-
west-2:account_ID:project:project_ID
```

i. In **AppType**, enter **Android**.

The following is a list of valid values for **AppType**:

- iOS
- Android
- Web
- j. In **App**, enter the path of the compiled app package. The path is relative to the root of the input artifact for the test stage. Typically, this path is similar to app-release.apk.
- k. In **TestType**, enter your type of test, and then in **Test**, enter the path of the test definition file. The path is relative to the root of the input artifact for your test.

The following is a list of valid values for **TestType**:

- APPIUM_JAVA_JUNIT
- APPIUM_JAVA_TESTNG
- APPIUM_NODE

- APPIUM_RUBY
- APPIUM_PYTHON
- APPIUM_WEB_JAVA_JUNIT
- APPIUM_WEB_JAVA_TESTNG
- APPIUM_WEB_NODE
- APPIUM_WEB_RUBY
- APPIUM_WEB_PYTHON
- BUILTIN_FUZZ
- INSTRUMENTATION
- XCTEST
- XCTEST_UI

🚯 Note

Custom environment nodes are not supported.

- l. In the remaining fields, provide the configuration that is appropriate for your test and application type.
- m. (Optional) In Advanced, provide configuration information for your test run.
- n. Choose Save.
- On the stage you are editing, choose **Done**. In the Amazon CodePipeline pane, choose
 Save, and then choose **Save** on the warning message.
- p. To submit your changes and start a pipeline build, choose **Release change**, and then choose **Release**.

Tutorial: Create a pipeline that tests your iOS app with Amazon Device Farm

You can use Amazon CodePipeline to easily configure a continuous integration flow in which your app is tested each time the source bucket changes. This tutorial shows you how to create and configure a pipeline to test your built iOS app from an S3 bucket. The pipeline detects the arrival

of a saved change through Amazon CloudWatch Events, and then uses <u>Device Farm</u> to test the built application.

A Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

<u> Important</u>

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region.

You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see Add a cross-Region action in CodePipeline.

You can try this out using your existing iOS app, or you can use the sample iOS app.

Note

The CodePipeline action for Device Farm is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Before you begin

- 1. Sign in to the Amazon Device Farm console and choose **Create a new project**.
- 2. Choose your project. In the browser, copy the URL of your new project. The URL contains the project ID.

3. Copy and retain this project ID. You use it when you create your pipeline in CodePipeline.

Here is an example URL for a project. To extract the project ID, copy the value after projects/. In this example, the project ID is eec4905f-98f8-40aa-9afc-4c1cfexample.

```
https://<region-URL>/devicefarm/home?region=us-west-2#/projects/
eec4905f-98f8-40aa-9afc-4c1cfexample/runs
```

Configure CodePipeline to use your Device Farm tests (Amazon S3 example)

- Create or use an S3 bucket with versioning enabled. Follow the instructions in <u>Step 1: Create</u> an S3 source bucket for your application to create an S3 bucket.
- 2. In the Amazon S3 console for your bucket, choose **Upload**, and follow the instructions to upload your .zip file.

Your sample application must be packaged in a .zip file.

- 3. To create your pipeline and add a source stage, do the following:
 - a. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
 - b. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
 - c. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
 - d. On the **Step 2: Choose pipeline settings** page, in **Pipeline name**, enter the name for your pipeline.
 - e. CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see pipeline types. For information about pricing for CodePipeline, see Pricing.
 - f. In **Service role**, leave **New service role** selected, and leave **Role name** unchanged. You can also choose to use an existing service role, if you have one.

🚯 Note

If you use a CodePipeline service role that was created before July 2018, you must add permissions for Device Farm. To do this, open the IAM console, find the role, and then add the following permissions to the role's policy. For more information, see Add permissions to the CodePipeline service role.

```
{
    "Effect": "Allow",
    "Action": [
        "devicefarm:ListProjects",
        "devicefarm:ListDevicePools",
        "devicefarm:GetRun",
        "devicefarm:GetUpload",
        "devicefarm:CreateUpload",
        "devicefarm:ScheduleRun"
    ],
    "Resource": "*"
}
```

- g. Leave the settings under Advanced settings at their defaults, and then choose Next.
- h. On the Step 3: Add source stage page, in Source provider, choose Amazon S3.
- i. In Amazon S3 location, enter the bucket, such as my-storage-bucket, and object key, such as s3-ios-test-1.zip for your .zip file.
- j. Choose Next.
- 4. In **Step 4: Add build stage**, create a placeholder build stage for your pipeline. This allows you to create the pipeline in the wizard. After you use the wizard to create your two-stage pipeline, you no longer need this placeholder build stage. After the pipeline is completed, this second stage is deleted and the new test stage is added in step 5.
 - a. In **Build provider**, choose **Add Jenkins**. This build selection is a placeholder. It is not used.
 - b. In **Provider name**, enter a name. The name is a placeholder. It is not used.
 - c. In Server URL, enter text. The text is a placeholder. It is not used.
 - d. In **Project name**, enter a name. The name is a placeholder. It is not used.
 - e. Choose Next.

f. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- g. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again.
- h. On **Step 7: Review**, choose **Create pipeline**. You should see a diagram that shows the source and build stages.

y-ios-pipeline	
○ Source	
Source Amazon S3 🖸 🔿 In progress - Just now	٩
Disable transition	
⊖ Build	
Build Custom Jenkins1 (Version: 1)	٩
O Didn't Run No executions yet	

- 5. Add a Device Farm test action to your pipeline as follows:
 - a. In the upper right, choose **Edit**.
 - b. Choose **Edit stage**. Choose **Delete**. This deletes the placeholder stage now that you no longer need it for pipeline creation.
 - c. At the bottom of the diagram, choose + Add stage.
 - d. In Stage name, enter a name for the stage, such as Test, and then choose **Add stage**.
 - e. Choose + Add action group.
 - f. In Action name, enter a name, such as DeviceFarmTest.
 - g. In **Action provider**, choose **Amazon Device Farm**. Allow **Region** to default to the pipeline Region.

h. In **Input artifacts**, choose the input artifact that matches the output artifact of the stage that comes before the test stage, such as SourceArtifact.

In the Amazon CodePipeline console, you can find the name of the output artifact for each stage by hovering over the information icon in the pipeline diagram. If your pipeline tests your app directly from the **Source** stage, choose **SourceArtifact**. If the pipeline includes a **Build** stage, choose **BuildArtifact**.

- i. In **ProjectId**, choose your Device Farm project ID. Use the steps at the start of this tutorial to retrieve your project ID.
- j. In **DevicePoolArn**, enter the ARN for the device pool. To get the available device pool ARNs for the project, including the ARN for Top Devices, use the Amazon CLI to enter the following command:

aws devicefarm list-device-pools --arn arn:aws:devicefarm:uswest-2:account_ID:project:project_ID

k. In **AppType**, enter **iOS**.

The following is a list of valid values for **AppType**:

- iOS
- Android
- Web
- l. In **App**, enter the path of the compiled app package. The path is relative to the root of the input artifact for the test stage. Typically, this path is similar to ios-test.ipa.
- m. In **TestType**, enter your type of test, and then in **Test**, enter the path of the test definition file. The path is relative to the root of the input artifact for your test.

If you're using one of the built-in Device Farm tests, enter the type of test configured in your Device Farm project, such as BUILTIN_FUZZ. In **FuzzEventCount**, enter a time in milliseconds, such as 6000. In **FuzzEventThrottle**, enter a time in milliseconds, such as 50.

If you aren't using one of the built-in Device Farm tests, enter your type of test, and then in **Test**, enter the path of the test definition file. The path is relative to the root of the input artifact for your test.

The following is a list of valid values for **TestType**:

- APPIUM_JAVA_JUNIT
- APPIUM_JAVA_TESTNG
- APPIUM_NODE
- APPIUM_RUBY
- APPIUM_PYTHON
- APPIUM_WEB_JAVA_JUNIT
- APPIUM_WEB_JAVA_TESTNG
- APPIUM_WEB_NODE
- APPIUM_WEB_RUBY
- APPIUM_WEB_PYTHON
- BUILTIN_FUZZ
- INSTRUMENTATION
- XCTEST
- XCTEST_UI

🚺 Note

Custom environment nodes are not supported.

- n. In the remaining fields, provide the configuration that is appropriate for your test and application type.
- o. (Optional) In **Advanced**, provide configuration information for your test run.
- p. Choose **Save**.
- q. On the stage you are editing, choose **Done**. In the Amazon CodePipeline pane, choose **Save**, and then choose **Save** on the warning message.
- r. To submit your changes and start a pipeline execution, choose **Release change**, and then choose **Release**.

Tutorial: Create a pipeline that deploys to Service Catalog

Service Catalog enables you to create and provision products based on Amazon CloudFormation

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

This tutorial shows you how to create and configure a pipeline to deploy your product template to Service Catalog and deliver changes you have made in your source repository (already created in GitHub, CodeCommit, or Amazon S3).

Note

When Amazon S3 is the source provider for your pipeline, you must upload to your bucket all source files packaged as a single .zip file. Otherwise, the source action fails.

First, you create a product in Service Catalog, and then you create a pipeline in Amazon CodePipeline. This tutorial provides two options for setting up the deployment configuration:

• Create a product in Service Catalog and upload a template file to your source repository. Provide product version and deployment configuration in the CodePipeline console (without a separate configuration file). See Option 1: Deploy to Service Catalog without a configuration file.

Note

The template file can be created in YAML or JSON format.

 Create a product in Service Catalog and upload a template file to your source repository. Provide product version and deployment configuration in a separate configuration file. See <u>Option 2</u>: <u>Deploy to Service Catalog using a configuration file</u>.

Option 1: Deploy to Service Catalog without a configuration file

In this example, you upload the sample Amazon CloudFormation template file for an S3 bucket, and then create your product in Service Catalog. Next, you create your pipeline and specify deployment configuration in the CodePipeline console.

Step 1: Upload sample template file to source repository

1. Open a text editor. Create a sample template by pasting the following into the file. Save the file as S3_template.json.

```
{
  "AWSTemplateFormatVersion": "2010-09-09",
  "Description": "CloudFormation Sample Template S3_Bucket: Sample template showing
 how to create a privately accessible S3 bucket. **WARNING** This template creates
 an S3 bucket. You will be billed for the resources used if you create a stack from
 this template.",
  "Resources": {
    "S3Bucket": {
      "Type": "AWS::S3::Bucket",
      "Properties": {}
    }
  },
  "Outputs": {
    "BucketName": {
      "Value": {
        "Ref": "S3Bucket"
      },
      "Description": "Name of Amazon S3 bucket to hold website content"
    }
  }
}
```

This template allows Amazon CloudFormation to create an S3 bucket that can be used by Service Catalog.

2. Upload the S3_template.json file to your Amazon CodeCommit repository.

Step 2: Create a product in Service Catalog

- 1. As an IT administrator, sign in to the Service Catalog console, go to the **Products** page, and then choose **Upload new product**.
- 2. On the **Upload new product** page, complete the following:
 - a. In **Product name**, enter the name you want to use for your new product.
 - b. In **Description**, enter the product catalog description. This description is shown in the product listing to help the user choose the correct product.
 - c. In **Provided by**, enter the name of your IT department or administrator.
 - d. Choose Next.
- (Optional) In Enter support details, enter contact information for product support, and choose Next.
- 4. In **Version details**, complete the following:
 - a. Choose **Upload a template file**. Browse for your S3_template.json file and upload it.
 - b. In **Version title**, enter the name of the product version (for example, **devops S3 v2**).
 - c. In **Description**, enter details that distinguish this version from other versions.
 - d. Choose Next.
- 5. On the **Review** page, verify that the information is correct, and then choose **Create**.
- 6. On the **Products** page, in the browser, copy the URL of your new product. This contains the product ID. Copy and retain this product ID. You use it when you create your pipeline in CodePipeline.

Here is the URL for a product named my-product. To extract the product ID, copy the value between the equals sign (=) and the ampersand (&). In this example, the product ID is prod-example123456.

```
https://<region-URL>/servicecatalog/home?region=<region>#/admin-products?
productCreated=prod-example123456&createdProductTitle=my-product
```

1 Note

Copy the URL for your product before you navigate away from the page. Once you navigate away from this page, you must use the CLI to obtain your product ID.

After a few seconds, your product appears on the **Products** page. You might need to refresh your browser to see the product in the list.

Step 3: Create your pipeline

- 1. To name your pipeline and select parameters for your pipeline, do the following:
 - a. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
 - b. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
 - c. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
 - d. In **Step 2: Choose pipeline settings**, in **Pipeline name**, enter a name for your pipeline.
 - e. CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see pipeline types. For information about pricing for CodePipeline, see Pricing.
 - f. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
 - g. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 2. To add a source stage on the **Step 3: Add source stage** page, do the following:
 - a. In **Source provider**, choose **Amazon CodeCommit**.
 - b. In **Repository name** and **Branch name**, enter the repository and branch you want to use for your source action.
 - c. Choose Next.
- 3. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.
- 4. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

5. In **Step 6: Add deploy stage**, complete the following:

- a. In **Deploy provider**, choose **Amazon Service Catalog**.
- b. For deployment configuration, choose Enter deployment configuration.
- c. In **Product ID**, paste the product ID you copied from the Service Catalog console.
- d. In **Template file path**, enter the relative path where the template file is stored.
- e. In **Product type**, choose **Amazon CloudFormation template**.
- f. In **Product version name**, enter the name of the product version you specified in Service Catalog. If you want to have the template change deployed to a new product version, enter a product version name that has not been used for any previous product version in the same product.
- g. For **Input artifact**, choose the source input artifact.
- h. Choose **Next**.
- 6. In **Step 7: Review**, review your pipeline settings, and then choose **Create**.
- 7. After your pipeline runs successfully, on the deployment stage, choose **Details**. This opens your product in Service Catalog.

⊙ Source		
Source CodeCommit Succeeded - 1 minute ago	٩	
99e3b988 Source: Added S3_template.json 990	≥3b988	
⊘ Deploy		
Deploy ServiceCatalog 🖸	٩	
Succeeded - 1 minute ago		

8. Under your product information, choose your version name to open the product template. View the template deployment.

Step 4: Push a change and verify your product in Service Catalog

1. View your pipeline in the CodePipeline console, and on your source stage, choose **Details**. Your source Amazon CodeCommit repository opens in the console. Choose **Edit**, and make a change in the file (for example, to the description).

"Description": "Name of Amazon S3 bucket to hold and version website content"

- 2. Commit and push your change. Your pipeline starts after you push the change. When the run of the pipeline is complete, on the deployment stage, choose **Details** to open your product in Service Catalog.
- 3. Under your product information, choose the new version name to open the product template. View the deployed template change.

Option 2: Deploy to Service Catalog using a configuration file

In this example, you upload the sample Amazon CloudFormation template file for an S3 bucket, and then create your product in Service Catalog. You also upload a separate configuration file that specifies your deployment configuration. Next, you create your pipeline and specify the location of your configuration file.

Step 1: Upload sample template file to source repository

1. Open a text editor. Create a sample template by pasting the following into the file. Save the file as S3_template.json.

```
{
  "AWSTemplateFormatVersion": "2010-09-09",
  "Description": "CloudFormation Sample Template S3_Bucket: Sample template showing
 how to create a privately accessible S3 bucket. **WARNING** This template creates
 an S3 bucket. You will be billed for the resources used if you create a stack from
this template.",
 "Resources": {
    "S3Bucket": {
      "Type": "AWS::S3::Bucket",
      "Properties": {}
    }
 },
  "Outputs": {
    "BucketName": {
      "Value": {
        "Ref": "S3Bucket"
      },
      "Description": "Name of Amazon S3 bucket to hold website content"
    }
  }
}
```

This template allows Amazon CloudFormation to create an S3 bucket that can be used by Service Catalog.

2. Upload the S3_template.json file to your Amazon CodeCommit repository.

User Guide

Step 2: Create your product deployment configuration file

1. Open a text editor. Create the configuration file for your product. The configuration file is used to define your Service Catalog deployment parameters/preferences. You use this file when you create your pipeline.

This sample provides a ProductVersionName of "devops S3 v2" and a ProductVersionDescription of MyProductVersionDescription. If you want to have the template change deployed to a new product version, just enter a product version name that has not been used for any previous product version in the same product.

Save the file as sample_config.json.

```
{
   "SchemaVersion": "1.0",
   "ProductVersionName": "devops S3 v2",
   "ProductVersionDescription": "MyProductVersionDescription",
   "ProductType": "CLOUD_FORMATION_TEMPLATE",
   "Properties": {
        "TemplateFilePath": "/S3_template.json"
    }
}
```

This file creates the product version information for you each time your pipeline runs.

2. Upload the sample_config.json file to your Amazon CodeCommit repository. Make sure you upload this file to your source repository.

Step 3: Create a product in Service Catalog

- 1. As an IT administrator, sign in to the Service Catalog console, go to the **Products** page, and then choose **Upload new product**.
- 2. On the **Upload new product** page, complete the following:
 - a. In **Product name**, enter the name you want to use for your new product.
 - b. In **Description**, enter the product catalog description. This description appears in the product listing to help the user choose the correct product.
 - c. In **Provided by**, enter the name of your IT department or administrator.
 - d. Choose Next.

- 3. (Optional) In **Enter support details**, enter product support contact information, and then choose **Next**.
- 4. In Version details, complete the following:
 - a. Choose **Upload a template file**. Browse for your S3_template.json file and upload it.
 - b. In **Version title**, enter the name of the product version (for example, "devops S3 v2").
 - c. In **Description**, enter details that distinguish this version from other versions.
 - d. Choose Next.
- 5. On the **Review** page, verify that the information is correct, and then choose **Confirm and upload**.
- 6. On the **Products** page, in the browser, copy the URL of your new product. This contains the product ID. Copy and retain this product ID. You use when you create your pipeline in CodePipeline.

Here is the URL for a product named my-product. To extract the product ID, copy the value between the equals sign (=) and the ampersand (&). In this example, the product ID is prod-example123456.

https://<region-URL>/servicecatalog/home?region=<region>#/admin-products?
productCreated=prod-example123456&createdProductTitle=my-product

🚺 Note

Copy the URL for your product before you navigate away from the page. Once you navigate away from this page, you must use the CLI to obtain your product ID.

After a few seconds, your product appears on the **Products** page. You might need to refresh your browser to see the product in the list.

Step 4: Create your pipeline

- 1. To name your pipeline and select parameters for your pipeline, do the following:
 - a. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

- b. Choose **Getting started**. Choose **Create pipeline**, and then enter a name for your pipeline.
- c. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
- d. Leave the settings under Advanced settings at their defaults, and then choose Next.
- 2. To add a source stage, do the following:
 - a. In Source provider, choose Amazon CodeCommit.
 - b. In **Repository name** and **Branch name**, enter the repository and branch you want to use for your source action.
 - c. Choose **Next**.
- 3. In **Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.
- 4. In Add deploy stage, complete the following:
 - a. In **Deploy provider**, choose **Amazon Service Catalog**.
 - b. Choose Use configuration file.
 - c. In **Product ID**, paste the product ID you copied from the Service Catalog console.
 - d. In **Configuration file path**, enter the file path of the configuration file in your repository.
 - e. Choose **Next**.
- 5. In **Review**, review your pipeline settings, and then choose **Create**.
- 6. After your pipeline runs successfully, on your deployment stage, choose **Details** to open your product in Service Catalog.

⊙ Source		
Source CodeCommit Succeeded - 1 minute ago 99e3b988	٩	
Source: Added S3_template.json 990	e3b988	
🔊 Deploy		
Deploy ServiceCatalog 🗹	١	
Succeeded - 1 minute ago Details 🖸		

7. Under your product information, choose your version name to open the product template. View the template deployment.

Step 5: Push a change and verify your product in Service Catalog

1. View your pipeline in the CodePipeline console, and on the source stage, choose **Details**. Your source Amazon CodeCommit repository opens in the console. Choose **Edit**, and then make a change in the file (for example, to the description).

"Description": "Name of Amazon S3 bucket to hold and version website content"

- 2. Commit and push your change. Your pipeline starts after you push the change. When the run of the pipeline is complete, on the deployment stage, choose **Details** to open your product in Service Catalog.
- 3. Under your product information, choose the new version name to open the product template. View the deployed template change.

Tutorial: Create a pipeline with Amazon CloudFormation

The examples provide sample templates that allow you to use Amazon CloudFormation to create a pipeline that deploys your application to your instances each time the source code changes. The sample template creates a pipeline that you can view in Amazon CodePipeline. The pipeline detects the arrival of a saved change through Amazon CloudWatch Events.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

The CodePipeline action for Amazon CloudFormation is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Topics

- Example 1: Create an Amazon CodeCommit pipeline with Amazon CloudFormation
- Example 2: Create an Amazon S3 pipeline with Amazon CloudFormation

Example 1: Create an Amazon CodeCommit pipeline with Amazon CloudFormation

This walkthrough shows you how to use the Amazon CloudFormation console to create infrastructure that includes a pipeline connected to a CodeCommit source repository. In this tutorial, you use the provided sample template file to create your resource stack, which includes your artifact store, pipeline, and change-detection resources, such as your Amazon CloudWatch Events rule. After you create your resource stack in Amazon CloudFormation, you can view your pipeline in the Amazon CodePipeline console. The pipeline is a two-stage pipeline with a CodeCommit source stage and a CodeDeploy deployment stage.

Prerequisites:

- You must have created a source repository. You can use the Amazon CodeCommit repository you created in <u>Tutorial: Create a simple pipeline (CodeCommit repository)</u>.
- You must have created a CodeDeploy application and deployment group. You can use the CodeDeploy resources you created in <u>Tutorial: Create a simple pipeline (CodeCommit repository)</u>.
- Choose one of these links to download the sample Amazon CloudFormation template file for creating a pipeline: <u>YAML</u> | <u>JSON</u>

Unzip the file and place it on your local computer.

• Download the <u>SampleApp_Linux.zip</u> sample application file.

Create your pipeline in Amazon CloudFormation

- Unzip the files from <u>SampleApp_Linux.zip</u> and upload the files to your Amazon CodeCommit repository. You must upload the unzipped files to the root directory of your repository. You can follow the instructions in <u>Step 2: Add sample code to your CodeCommit repository</u> to push the files to your repository.
- 2. Open the Amazon CloudFormation console and choose **Create Stack**. Choose **With new resources (standard)**.
- 3. Under **Specify template**, choose **Upload a template**. Select **Choose file** and then choose the template file from your local computer. Choose **Next**.
- 4. In **Stack name**, enter a name for your pipeline. Parameters specified by the sample template are displayed. Enter the following parameters:
 - a. In **ApplicationName**, enter the name of your CodeDeploy application.
 - b. In **BetaFleet**, enter the name of your CodeDeploy deployment group.
 - c. In **BranchName**, enter the repository branch you want to use.
 - d. In **RepositoryName**, enter the name of your CodeCommit source repository.
- 5. Choose **Next**. Accept the defaults on the following page, and then choose **Next**.
- 6. In **Capabilities**, select **I acknowledge that Amazon CloudFormation might create IAM resources**, and then choose **Create stack**.
- 7. After your stack creation is complete, view the event list to check for any errors.

Troubleshooting

The IAM user who is creating the pipeline in Amazon CloudFormation might require additional permissions to create resources for the pipeline. The following permissions are required in the policy to allow Amazon CloudFormation to create the required Amazon CloudWatch Events resources for the CodeCommit pipeline:

```
{
    "Effect": "Allow",
    "Action": [
        "events:PutRule",
        "events:PutEvents",
        "events:PutTargets",
        "events:DeleteRule",
        "events:RemoveTargets",
        "events:DescribeRule"
    ],
    "Resource": "resource_ARN"
}
```

8. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.

Under **Pipelines**, choose your pipeline and choose **View**. The diagram shows your pipeline source and deployment stages.

🚯 Note

To view the pipeline that was created, find the **Logical ID** column under the **Resources** tab for your stack in Amazon CloudFormation. Note the name in the **Physical ID** column for the pipeline. In CodePipeline, you can view the pipeline with the same Physical ID (pipeline name) in the Region where you created your stack.

9. In your source repository, commit and push a change. Your change-detection resources pick up the change, and your pipeline starts.

Example 2: Create an Amazon S3 pipeline with Amazon CloudFormation

This walkthrough shows you how to use the Amazon CloudFormation console to create infrastructure that includes a pipeline connected to an Amazon S3 source bucket. In this tutorial, you use the provided sample template file to create your resource stack, which includes your source bucket, artifact store, pipeline, and change-detection resources, such as your Amazon CloudWatch Events rule and CloudTrail trail. After you create your resource stack in Amazon CloudFormation, you can view your pipeline in the Amazon CodePipeline console. The pipeline is a two-stage pipeline with an Amazon S3 source stage and a CodeDeploy deployment stage.

Prerequisites:

You must have the following resources to use with the Amazon CloudFormation sample template:

- You must have created the Amazon EC2 instances, where you installed the CodeDeploy agent on the instances. You must have created a CodeDeploy application and deployment group. Use the Amazon EC2 and CodeDeploy resources you created in <u>Tutorial: Create a simple pipeline</u> (CodeCommit repository).
- Choose the following links to download the sample Amazon CloudFormation template files for creating a pipeline with an Amazon S3 source:
 - Download the sample template for your pipeline: <u>YAML | JSON</u>
 - Download the sample template for your CloudTrail bucket and trail: YAML | JSON
 - Unzip the files and place them on your local computer.
- Download the sample application from <a>SampleApp_Linux.zip.

Save the .zip file on your local computer. You upload the .zip file after the stack is created.

Create your pipeline in Amazon CloudFormation

- 1. Open the Amazon CloudFormation console, and choose **Create Stack**. Choose **With new resources (standard)**.
- 2. In **Choose a template**, choose **Upload a template**. Select **Choose file**, and then choose the template file from your local computer. Choose **Next**.
- 3. In **Stack name**, enter a name for your pipeline. Parameters specified by the sample template are displayed. Enter the following parameters:

- a. In **ApplicationName**, enter the name of your CodeDeploy application. You can replace the DemoApplication default name.
- b. In **BetaFleet**, enter the name of your CodeDeploy deployment group. You can replace the DemoFleet default name.
- c. In **SourceObjectKey**, enter SampleApp_Linux.zip. You upload this file to your bucket after the template creates the bucket and pipeline.
- 4. Choose **Next**. Accept the defaults on the following page, and then choose **Next**.
- 5. In **Capabilities**, select **I acknowledge that Amazon CloudFormation might create IAM resources**, and then choose **Create stack**.
- 6. After your stack creation is complete, view the event list to check for any errors.

Troubleshooting

The IAM userwho is creating the pipeline in Amazon CloudFormation might require additional permissions to create resources for the pipeline. The following permissions are required in the policy to allow Amazon CloudFormation to create the required Amazon CloudWatch Events resources for the Amazon S3 pipeline:

```
{
    "Effect": "Allow",
    "Action": [
        "events:PutRule",
        "events:PutEvents",
        "events:PutTargets",
        "events:DeleteRule",
        "events:RemoveTargets",
        "events:DescribeRule"
    ],
    "Resource": "resource_ARN"
}
```

7. In Amazon CloudFormation, in the **Resources** tab for your stack, view the resources that were created for your stack.

1 Note

To view the pipeline that was created, find the **Logical ID** column under the **Resources** tab for your stack in Amazon CloudFormation. Note the name in the **Physical ID**

column for the pipeline. In CodePipeline, you can view the pipeline with the same Physical ID (pipeline name) in the Region where you created your stack.

Choose the S3 bucket with a sourcebucket label in the name, such as s3-cfncodepipeline-sourcebucket-y04EXAMPLE. Do not choose the pipeline artifact bucket.

The source bucket is empty because the resource is newly created by Amazon CloudFormation. Open the Amazon S3 console and locate your sourcebucket bucket. Choose **Upload**, and follow the instructions to upload your SampleApp_Linux.zip .zip file.

🚯 Note

When Amazon S3 is the source provider for your pipeline, you must upload to your bucket all source files packaged as a single .zip file. Otherwise, the source action fails.

8. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

Under **Pipelines**, choose your pipeline, and then choose **View**. The diagram shows your pipeline source and deployment stages.

9. Complete the steps in the following procedure to create your Amazon CloudTrail resources.

Create your Amazon CloudTrail resources in Amazon CloudFormation

- 1. Open the Amazon CloudFormation console, and choose **Create Stack**.
- 2. In **Choose a template**, choose **Upload a template to Amazon S3**. Choose **Browse**, and then select the template file for the Amazon CloudTrail resources from your local computer. Choose **Next**.
- 3. In **Stack name**, enter a name for your resource stack. Parameters specified by the sample template are displayed. Enter the following parameters:
 - In **SourceObjectKey**, accept the default for the sample application's zip file.
- 4. Choose **Next**. Accept the defaults on the following page, and then choose **Next**.
- 5. In **Capabilities**, select **I acknowledge that Amazon CloudFormation might create IAM resources**, and then choose **Create**.
- 6. After your stack creation is complete, view the event list to check for any errors.

The following permissions are required in the policy to allow Amazon CloudFormation to create the required CloudTrail resources for the Amazon S3 pipeline:

```
{
    "Effect": "Allow",
    "Action": [
        "cloudtrail:CreateTrail",
        "cloudtrail:DeleteTrail",
        "cloudtrail:StartLogging",
        "cloudtrail:StopLogging",
        "cloudtrail:PutEventSelectors"
    ],
    "Resource": "resource_ARN"
}
```

7. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.

Under **Pipelines**, choose your pipeline, and then choose **View**. The diagram shows your pipeline source and deployment stages.

8. In your source bucket, commit and push a change. Your change-detection resources pick up the change and your pipeline starts.

Tutorial: Create a pipeline that uses variables from Amazon CloudFormation deployment actions

In this tutorial, you use the Amazon CodePipeline console to create a pipeline with a deployment action. When the pipeline runs, the template creates a stack and also creates an outputs file. Outputs generated by the stack template are the variables generated by the Amazon CloudFormation action in CodePipeline.

In the action where you create the stack from the template, you designate a variable namespace. The variables produced by the outputs file can then be consumed by subsequent actions. In this example, you create a change set based on the StackName variable produced by the Amazon CloudFormation action. After a manual approval, you execute the change set and then create a delete stack action that deletes the stack based on the StackName variable.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

The CodePipeline action for Amazon CloudFormation is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Topics

- Prerequisites: Create an Amazon CloudFormation service role and a CodeCommit repository
- Step 1: Download, edit, and upload the sample Amazon CloudFormation template
- Step 2: Create your pipeline
- Step 3: Add an Amazon CloudFormation deployment action to create the change set
- <u>Step 4: Add a manual approval action</u>
- Step 5: Add a CloudFormation deployment action to execute the change set
- Step 6: Add a CloudFormation deployment action to delete the stack

Prerequisites: Create an Amazon CloudFormation service role and a CodeCommit repository

You must already have the following:

- A CodeCommit repository. You can use the Amazon CodeCommit repository you created in Tutorial: Create a simple pipeline (CodeCommit repository).
- This example creates an Amazon DocumentDB stack from a template. You must use Amazon Identity and Access Management (IAM) to create an Amazon CloudFormation service role with the following permissions for Amazon DocumentDB.

```
"rds:DescribeDBClusters",
"rds:CreateDBCluster",
"rds:DeleteDBCluster",
```

Step 1: Download, edit, and upload the sample Amazon CloudFormation template

Download the sample Amazon CloudFormation template file and upload it to your CodeCommit repository.

- Navigate to the sample template for your Region. For example, use the table at <u>https://docs.aws.amazon.com/documentdb/latest/developerguide/</u> <u>quick_start_cfn.html#quick_start_cfn-launch_stack</u> to choose the Region and download the template. Download the template for an Amazon DocumentDB Cluster. The file name is documentdb_full_stack.yaml.
- 2. Unzip the documentdb_full_stack.yaml file, and open it in a text editor. Make the following changes.
 - a. For this example, add the following Purpose: parameter to your Parameters section in the template.

```
Purpose:
  Type: String
  Default: testing
  AllowedValues:
    - testing
    - production
  Description: The purpose of this instance.
```

b. For this example, add the following StackName output to your Outputs: section in the template.

```
StackName:
Value: !Ref AWS::StackName
```

3. Upload the template file to your Amazon CodeCommit repository. You must upload the unzipped and edited template file to the root directory of your repository.

To use the CodeCommit console to upload your files:

a. Open the CodeCommit console, and choose your repository from the **Repositories** list.

- b. Choose Add file, and then choose Upload file.
- c. Select **Choose file**, and then browse for your file. Commit the change by entering your user name and email address. Choose **Commit changes**.

Your file should look like this at the root level in your repository:

```
documentdb_full_stack.yaml
```

Step 2: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with a CodeCommit action where the source artifact is your template file.
- A deployment stage with an Amazon CloudFormation deployment action.

Each action in the source and deployment stages created by the wizard is assigned a variable namespace, SourceVariables and DeployVariables, respectively. Because the actions have a namespace assigned, the variables configured in this example are available to downstream actions. For more information, see <u>Variables reference</u>.

To create a pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyCFNDeployPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, do one of the following:
 - Choose **New service role** to allow CodePipeline to create a service role in IAM.
 - Choose **Existing service role**. In **Role name**, choose your service role from the list.

7. In Artifact store:

- a. Choose **Default location** to use the default artifact store, such as the Amazon S3 artifact bucket designated as the default, for your pipeline in the Region you selected for your pipeline.
- b. Choose **Custom location** if you already have an artifact store, such as an Amazon S3 artifact bucket, in the same Region as your pipeline.

i Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline. When you create or edit a pipeline, you must have an artifact bucket in the pipeline Region and one artifact bucket per Amazon Region where you are running an action. For more information, see Input and output artifacts and CodePipeline pipeline structure reference.

Choose Next.

- 8. In Step 3: Add source stage:
 - a. In **Source provider**, choose **Amazon CodeCommit**.
 - b. In **Repository name**, choose the name of the CodeCommit repository that you created in Step 1: Create a CodeCommit repository.
 - c. In **Branch name**, choose the name of the branch that contains your latest code update.

After you select the repository name and branch, the Amazon CloudWatch Events rule to be created for this pipeline is displayed.

Choose Next.

9. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. In Step 6: Add deploy stage:
 - a. In Action name, choose Deploy. In Deploy provider, choose CloudFormation.
 - b. In Action mode, choose Create or update a stack.
 - c. In **Stack name**, enter a name for the stack. This is the name of the stack that the template will create.
 - d. In **Output file name**, enter a name for the outputs file, such as **outputs**. This is the name of the file that will be created by the action after the stack is created.
 - e. Expand **Advanced**. Under **Parameter overrides**, enter your template overrides as keyvalue pairs. For example, this template requires the following overrides.

```
{
"DBClusterName": "MyDBCluster",
"DBInstanceName": "MyDBInstance",
"MasterUser": "UserName",
"MasterPassword": "Password",
"DBInstanceClass": "db.r4.large",
"Purpose": "testing"}
```

If you don't enter overrides, the template creates a stack with default values.

- f. Choose **Next**.
- g. On **Step 7: Review**, choose **Create pipeline**. You should see a diagram that shows the pipeline stages. Allow your pipeline to run. Your two-stage pipeline is complete and ready for the additional stages to be added.

Step 3: Add an Amazon CloudFormation deployment action to create the change set

Create a next action in your pipeline that will allow Amazon CloudFormation to create the change set before the manual approval action.

1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

Under **Pipelines**, choose your pipeline and choose **View**. The diagram shows your pipeline source and deployment stages.

- 2. Choose to edit the pipeline, or continue to display the pipeline in **Edit** mode.
- 3. Choose to edit the **Deploy** stage.
- 4. Add a deployment action that will create a change set for the stack that was created in the previous action. You add this action after the existing action in the stage.
 - a. In Action name, enter Change_Set. In Action provider, choose Amazon CloudFormation .
 - b. In Input artifact, choose SourceArtifact.
 - c. In Action mode, choose Create or replace a change set.
 - d. In **Stack name**, enter the variable syntax as shown. This is the name of the stack that the change set is created for, where the default namespace DeployVariables is assigned to the action.

#{DeployVariables.StackName}

e. In **Change set name**, enter the name of the change set.

```
my-changeset
```

f. In **Parameter Overrides**, change the Purpose parameter from testing to production.

```
{
  "DBClusterName": "MyDBCluster",
  "DBInstanceName": "MyDBInstance",
  "MasterUser": "UserName",
  "MasterPassword": "Password",
  "DBInstanceClass": "db.r4.large",
  "Purpose": "production"}
```

g. Choose **Done** to save the action.

Step 4: Add a manual approval action

Create a manual approval action in your pipeline.

1. Choose to edit the pipeline, or continue to display the pipeline in **Edit** mode.

- 2. Choose to edit the **Deploy** stage.
- 3. Add a manual approval action after the deploy action that creates the change set. This action allows you to verify the created resource change set in Amazon CloudFormation before the pipeline executes the change set.

Step 5: Add a CloudFormation deployment action to execute the change set

Create a next action in your pipeline that allows Amazon CloudFormation to execute the change set after the manual approval action.

1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

Under **Pipelines**, choose your pipeline and choose **View**. The diagram shows your pipeline source and deployment stages.

- 2. Choose to edit the pipeline, or continue to display the pipeline in **Edit** mode.
- 3. Choose to edit the **Deploy** stage.
- 4. Add a deployment action that will execute the change set that was approved in the previous manual action:
 - a. In Action name, enter Execute_Change_Set. In Action provider, choose Amazon CloudFormation.
 - b. In Input artifact, choose SourceArtifact.
 - c. In Action mode, choose Execute a change set.
 - d. In **Stack name**, enter the variable syntax as shown. This is the name of the stack that the change set is created for.

#{DeployVariables.StackName}

e. In **Change set name**, enter the name of the change set you created in the previous action.

my-changeset

- f. Choose **Done** to save the action.
- g. Continue the pipeline run.

Step 6: Add a CloudFormation deployment action to delete the stack

Create a final action in your pipeline that allows Amazon CloudFormation to get the stack name from the variable in the outputs file and delete the stack.

1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

Under **Pipelines**, choose your pipeline and choose **View**. The diagram shows your pipeline source and deployment stages.

- 2. Choose to edit the pipeline.
- 3. Choose to edit the **Deploy** stage.
- 4. Add a deployment action that will delete the stack:
 - a. In Action name, choose DeleteStack. In Deploy provider, choose CloudFormation.
 - b. In Action mode, choose Delete a stack.
 - c. In **Stack name**, enter the variable syntax as shown. This is the name of the stack that the action will delete.
 - d. Choose **Done** to save the action.
 - e. Choose **Save** to save the pipeline.

The pipeline runs when it is saved.

Tutorial: Amazon ECS Standard Deployment with CodePipeline

This tutorial helps you to create a complete, end-to-end continuous deployment (CD) pipeline with Amazon ECS with CodePipeline.

🔥 Important

As part of creating a pipeline in the console, an S3 artifact bucket will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🚯 Note

This tutorial is for the Amazon ECS standard deployment action for CodePipeline. For a tutorial that uses the Amazon ECS to CodeDeploy blue/green deployment action in CodePipeline, see <u>Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-</u><u>CodeDeploy deployment</u>.

i Note

This tutorial is for the Amazon ECS standard deployment action for CodePipeline with a source action. For a tutorial that uses the Amazon ECSstandard deployment action along with the ECRBuildAndPublish build action in CodePipeline to push your image, see <u>Tutorial</u>: <u>Build and push a Docker image to Amazon ECR with CodePipeline (V2 type)</u>.

Prerequisites

There are a few resources that you must have in place before you can use this tutorial to create your CD pipeline. Here are the things you need to get started:

🚺 Note

All of these resources should be created within the same Amazon Region.

- A source control repository (this tutorial uses CodeCommit) with your Dockerfile and application source. For more information, see <u>Create a CodeCommit Repository</u> in the Amazon CodeCommit User Guide.
- A Docker image repository (this tutorial uses Amazon ECR) that contains an image you have built from your Dockerfile and application source. For more information, see <u>Creating a Repository</u> and <u>Pushing an Image</u> in the *Amazon Elastic Container Registry User Guide*.
- An Amazon ECS task definition that references the Docker image hosted in your image repository. For more information, see <u>Creating a Task Definition</u> in the Amazon Elastic Container Service Developer Guide.

🔥 Important

The Amazon ECS standard deployment action for CodePipeline creates its own revision of the task definition based on the the revision used by the Amazon ECS service. If you create new revisions for the task definition without updating the Amazon ECS service, the deployment action will ignore those revisions.

Below is a sample task definition used for this tutorial. The value you use for name and family will be used in the next step for your build specification file.

```
{
  "ipcMode": null,
  "executionRoleArn": "role_ARN",
  "containerDefinitions": [
    {
      "dnsSearchDomains": null,
      "environmentFiles": null,
      "logConfiguration": {
        "logDriver": "awslogs",
        "secretOptions": null,
        "options": {
          "awslogs-group": "/ecs/hello-world",
          "awslogs-region": "us-west-2",
          "awslogs-stream-prefix": "ecs"
        }
      },
      "entryPoint": null,
      "portMappings": [
        {
          "hostPort": 80,
          "protocol": "tcp",
          "containerPort": 80
        }
      ],
      "command": null,
      "linuxParameters": null,
      "cpu": 0,
      "environment": [],
      "resourceRequirements": null,
      "ulimits": null,
```

```
User Guide
```

```
"dnsServers": null,
    "mountPoints": [],
    "workingDirectory": null,
    "secrets": null,
    "dockerSecurityOptions": null,
    "memory": null,
    "memoryReservation": 128,
    "volumesFrom": [],
    "stopTimeout": null,
    "image": "image_name",
    "startTimeout": null,
    "firelensConfiguration": null,
    "dependsOn": null,
    "disableNetworking": null,
    "interactive": null,
    "healthCheck": null,
    "essential": true,
    "links": null,
    "hostname": null,
    "extraHosts": null,
    "pseudoTerminal": null,
    "user": null,
    "readonlyRootFilesystem": null,
    "dockerLabels": null,
    "systemControls": null,
    "privileged": null,
    "name": "hello-world"
  }
],
"placementConstraints": [],
"memory": "2048",
"taskRoleArn": null,
"compatibilities": [
  "EC2",
  "FARGATE"
],
"taskDefinitionArn": "ARN",
"family": "hello-world",
"requiresAttributes": [],
"pidMode": null,
"requiresCompatibilities": [
  "FARGATE"
],
"networkMode": "awsvpc",
```

```
"cpu": "1024",
"revision": 1,
"status": "ACTIVE",
"inferenceAccelerators": null,
"proxyConfiguration": null,
"volumes": []
}
```

 An Amazon ECS cluster that is running a service that uses your previously mentioned task definition. For more information, see <u>Creating a Cluster</u> and <u>Creating a Service</u> in the Amazon Elastic Container Service Developer Guide.

After you have satisfied these prerequisites, you can proceed with the tutorial and create your CD pipeline.

Step 1: Add a Build Specification File to Your Source Repository

This tutorial uses CodeBuild to build your Docker image and push the image to Amazon ECR. Add a buildspec.yml file to your source code repository to tell CodeBuild how to do that. The example build specification below does the following:

- Pre-build stage:
 - Log in to Amazon ECR.
 - Set the repository URI to your ECR image and add an image tag with the first seven characters of the Git commit ID of the source.
- Build stage:
 - Build the Docker image and tag the image both as latest and with the Git commit ID.
- Post-build stage:
 - Push the image to your ECR repository with both tags.
 - Write a file called imagedefinitions.json in the build root that has your Amazon ECS service's container name and the image and tag. The deployment stage of your CD pipeline uses this information to create a new revision of your service's task definition, and then it updates the service to use the new task definition. The imagedefinitions.json file is required for the ECS job worker.

Paste this sample text to create your buildspec.yml file, and replace the values for your image and task definition. This text uses the example account ID 111122223333.

```
version: 0.2
phases:
  pre_build:
    commands:
      - echo Logging in to Amazon ECR...
      - aws --version
      - aws ecr get-login-password --region $AWS_DEFAULT_REGION | docker login --
username AWS --password-stdin 111122223333.dkr.ecr.us-west-2.amazonaws.com
      - REPOSITORY_URI=012345678910.dkr.ecr.us-west-2.amazonaws.com/hello-world
      - COMMIT_HASH=$(echo $CODEBUILD_RESOLVED_SOURCE_VERSION | cut -c 1-7)
      - IMAGE_TAG=${COMMIT_HASH:=latest}
  build:
    commands:
      - echo Build started on `date`
      - echo Building the Docker image...
      - docker build -t $REPOSITORY_URI:latest .
      docker tag $REPOSITORY_URI:latest $REPOSITORY_URI:$IMAGE_TAG
  post_build:
    commands:
      - echo Build completed on `date`
      - echo Pushing the Docker images...
      - docker push $REPOSITORY_URI:latest
      - docker push $REPOSITORY_URI:$IMAGE_TAG
      - echo Writing image definitions file...
      - printf '[{"name":"hello-world","imageUri":"%s"}]' $REPOSITORY_URI:$IMAGE_TAG >
 imagedefinitions.json
artifacts:
    files: imagedefinitions.json
```

The build specification was written for the sample task definition that was provided in <u>Prerequisites</u>, used by the Amazon ECS service for this tutorial. The REPOSITORY_URI value corresponds to the image repository (without any image tag), and the *hello-world* value near the end of the file corresponds to the container name in the service's task definition.

To add a buildspec.yml file to your source repository

- 1. Open a text editor and then copy and paste the build specification above into a new file.
- Replace the REPOSITORY_URI value (012345678910.dkr.ecr.uswest-2.amazonaws.com/hello-world) with your Amazon ECR repository URI (without

any image tag) for your Docker image. Replace *hello-world* with the container name in your service's task definition that references your Docker image.

- 3. Commit and push your buildspec.yml file to your source repository.
 - a. Add the file.

git add .

b. Commit the change.

git commit -m "Adding build specification."

c. Push the commit.

git push

Step 2: Creating Your Continuous Deployment Pipeline

Use the CodePipeline wizard to create your pipeline stages and connect your source repository to your ECS service.

To create your pipeline

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the Welcome page, choose Create pipeline.

If this is your first time using CodePipeline, an introductory page appears instead of **Welcome**. Choose **Get Started Now**.

- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In **Step 2: Choose pipeline settings**, in **Pipeline name**, type the name for your pipeline. For this tutorial, the pipeline name is **hello-world**.
- 5. In **Pipeline type**, keep the default selection at **V2**. Pipeline types differ in characteristics and price. For more information, see <u>Pipeline types</u>. Choose **Next**.
- 6. On the Step 3: Add source stage page, for Source provider, choose Amazon CodeCommit.

- a. For **Repository name**, choose the name of the CodeCommit repository to use as the source location for your pipeline.
- b. For **Branch name**, choose the branch to use and choose **Next**.
- 7. On the **Step 4: Add build stage** page, for **Build provider** choose **Amazon CodeBuild**, and then choose **Create project**.
 - a. For **Project name**, choose a unique name for your build project. For this tutorial, the project name is **hello-world**.
 - b. For **Environment image**, choose **Managed image**.
 - c. For **Operating system**, choose **Amazon Linux 2**.
 - d. For **Runtime(s)**, choose **Standard**.
 - e. For Image, choose aws/codebuild/amazonlinux2-x86_64-standard:3.0.
 - f. For **Image version** and **Environment type**, use the default values.
 - g. Select Enable this flag if you want to build Docker images or want your builds to get elevated privileges.
 - h. Deselect **CloudWatch logs**. You might need to expand **Advanced**.
 - i. Choose **Continue to CodePipeline**.
 - j. Choose Next.

🚯 Note

The wizard creates a CodeBuild service role for your build project, called **codebuild-***build-project-name*-service-role. Note this role name, as you add Amazon ECR permissions to it later.

8. On the **Step 5: Add deploy stage** page, for **Deployment provider**, choose **Amazon ECS**.

- a. For **Cluster name**, choose the Amazon ECS cluster in which your service is running. For this tutorial, the cluster is **default**.
- b. For **Service name**, choose the service to update and choose **Next**. For this tutorial, the service name is **hello-world**.
- 9. On the **Step 6: Review** page, review your pipeline configuration and choose **Create pipeline** to create the pipeline.

🚯 Note

Now that the pipeline has been created, it attempts to run through the different pipeline stages. However, the default CodeBuild role created by the wizard does not have permissions to execute all of the commands contained in the buildspec.yml file, so the build stage fails. The next section adds the permissions for the build stage.

Step 3: Add Amazon ECR Permissions to the CodeBuild Role

The CodePipeline wizard created an IAM role for the CodeBuild build project, called **codebuild-build-project-name-service-role**. For this tutorial, the name is **codebuild-hello-world-service-role**. Because the buildspec.yml file makes calls to Amazon ECR API operations, the role must have a policy that allows permissions to make these Amazon ECR calls. The following procedure helps you attach the proper permissions to the role.

To add Amazon ECR permissions to the CodeBuild role

- 1. Open the IAM console at https://console.amazonaws.cn/iam/.
- 2. In the left navigation pane, choose **Roles**.
- 3. In the search box, type **codebuild-** and choose the role that was created by the CodePipeline wizard. For this tutorial, the role name is **codebuild-hello-world-service-role**.
- 4. On the **Summary** page, choose **Attach policies**.
- 5. Select the box to the left of the AmazonEC2ContainerRegistryPowerUser policy, and choose Attach policy.

Step 4: Test Your Pipeline

Your pipeline should have everything for running an end-to-end native Amazon continuous deployment. Now, test its functionality by pushing a code change to your source repository.

To test your pipeline

- 1. Make a code change to your configured source repository, commit, and push the change.
- 2. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 3. Choose your pipeline from the list.

4. Watch the pipeline progress through its stages. Your pipeline should complete and your Amazon ECS service runs the Docker image that was created from your code change.

Tutorial: Create a pipeline with an Amazon ECR source and ECSto-CodeDeploy deployment

In this tutorial, you configure a pipeline in Amazon CodePipeline that deploys container applications using a blue/green deployment that supports Docker images. In a blue/green deployment, you can launch the new version of your application alongside the old version and test the new version before you reroute traffic. You can also monitor the deployment process and rapidly roll back if there is an issue.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

Note

This tutorial is for the Amazon ECS to CodeDeploy blue/green deployment action for CodePipeline. For a tutorial that uses the Amazon ECS standard deployment action in CodePipeline, see Tutorial: Amazon ECS Standard Deployment with CodePipeline.

The completed pipeline detects changes to your image, which is stored in an image repository such as Amazon ECR, and uses CodeDeploy to route and deploy traffic to an Amazon ECS cluster and load balancer. CodeDeploy uses a listener to reroute traffic to the port of the updated container specified in the AppSpec file. For information about how the load balancer, production listener, target groups, and your Amazon ECS application are used in a blue/green deployment, see <u>Tutorial</u>: Deploy an Amazon ECS Service. The pipeline is also configured to use a source location, such as CodeCommit, where your Amazon ECS task definition is stored. In this tutorial, you configure each of these Amazon resources and then create your pipeline with stages that contain actions for each resource.

Your continuous delivery pipeline will automatically build and deploy container images whenever source code is changed or a new base image is uploaded to Amazon ECR.

This flow uses the following artifacts:

- A Docker image file that specifies the container name and repository URI of your Amazon ECR image repository.
- An Amazon ECS task definition that lists your Docker image name, container name, Amazon ECS service name, and load balancer configuration.
- A CodeDeploy AppSpec file that specifies the name of the Amazon ECS task definition file, the name of the updated application's container, and the container port where CodeDeploy reroutes production traffic. It can also specify optional network configuration and Lambda functions you can run during deployment lifecycle event hooks.

🚯 Note

When you commit a change to your Amazon ECR image repository, the pipeline source action creates an imageDetail.json file for that commit. For information about the imageDetail.json file, see <u>imageDetail.json file for Amazon ECS blue/green deployment</u> actions.

When you create or edit your pipeline and update or specify source artifacts for your deployment stage, make sure to point to the source artifacts with the latest name and version you want to use. After you set up your pipeline, as you make changes to your image or task definition, you might need to update your source artifact files in your repositories and then edit the deployment stage in your pipeline.

Topics

- Prerequisites
- Step 1: Create image and push to an Amazon ECR repository
- Step 2: Create task definition and AppSpec source files and push to a CodeCommit repository

- Step 3: Create your Application Load Balancer and target groups
- Step 4: Create your Amazon ECS cluster and service
- Step 5: Create your CodeDeploy application and deployment group (ECS compute platform)
- Step 6: Create your pipeline
- Step 7: Make a change to your pipeline and verify deployment

Prerequisites

You must have already created the following resources:

- A CodeCommit repository. You can use the Amazon CodeCommit repository you created in Tutorial: Create a simple pipeline (CodeCommit repository).
- Launch an Amazon EC2 Linux instance and install Docker to create an image as shown in this tutorial. If you already have an image you want to use, you can skip this prerequisite.

Step 1: Create image and push to an Amazon ECR repository

In this section, you use Docker to create an image and then use the Amazon CLI to create an Amazon ECR repository and push the image to the repository.

🚺 Note

If you already have an image you want to use, you can skip this step.

To create an image

1. Sign in to your Linux instance where you have Docker installed.

Pull down an image for nginx. This command provides the nginx:latest image:

docker pull nginx

2. Run docker images. You should see the image in the list.

docker images

To create an Amazon ECR repository and push your image

1. Create an Amazon ECR repository to store your image. Make a note of the repositoryUri in the output.

```
aws ecr create-repository --repository-name nginx
```

Output:

```
{
    "repository": {
        "registryId": "aws_account_id",
        "repositoryName": "nginx",
        "repositoryArn": "arn:aws:ecr:us-east-1:aws_account_id:repository/nginx",
        "createdAt": 1505337806.0,
        "repositoryUri": "aws_account_id.dkr.ecr.us-east-1.amazonaws.com/nginx"
    }
}
```

2. Tag the image with the repositoryUri value from the previous step.

docker tag nginx:latest aws_account_id.dkr.ecr.us-east-1.amazonaws.com/nginx:latest

3. Run the **aws ecr get-login-password** command, as shown in this example for the us-west-2 Region and the 111122223333 account ID.

```
aws ecr get-login-password --region us-west-2 | docker login --username AWS --
password-stdin 111122223333.dkr.ecr.us-west-2.amazonaws.com/nginx
```

4. Push the image to Amazon ECR using the repositoryUri from the earlier step.

docker push 111122223333.dkr.ecr.us-east-1.amazonaws.com/nginx:latest

Step 2: Create task definition and AppSpec source files and push to a CodeCommit repository

In this section, you create a task definition JSON file and register it with Amazon ECS. You then create an AppSpec file for CodeDeploy and use your Git client to push the files to your CodeCommit repository.

To create a task definition for your image

1. Create a file named taskdef.json with the following contents. For image, enter your image name, such as nginx. This value is updated when your pipeline runs.

Note

Make sure that the execution role specified in the task definition contains the AmazonECSTaskExecutionRolePolicy. For more information, see <u>Amazon ECS</u> <u>Task Execution IAM Role</u> in the *Amazon ECS Developer Guide*.

```
{
    "executionRoleArn": "arn:aws:iam::account_ID:role/ecsTaskExecutionRole",
    "containerDefinitions": [
        {
            "name": "sample-website",
            "image": "nginx",
            "essential": true,
            "portMappings": [
                {
                     "hostPort": 80,
                     "protocol": "tcp",
                     "containerPort": 80
                }
            ]
        }
    ],
    "requiresCompatibilities": [
        "FARGATE"
    ],
    "networkMode": "awsvpc",
    "cpu": "256",
    "memory": "512",
    "family": "ecs-demo"
}
```

2. Register your task definition with the taskdef.json file.

aws ecs register-task-definition --cli-input-json file://taskdef.json

3. After the task definition is registered, edit your file to remove the image name and include the <IMAGE1_NAME> placeholder text in the image field.

```
{
    "executionRoleArn": "arn:aws:iam::account_ID:role/ecsTaskExecutionRole",
    "containerDefinitions": [
        {
            "name": "sample-website",
            "image": "<IMAGE1_NAME>",
            "essential": true,
            "portMappings": [
                {
                     "hostPort": 80,
                     "protocol": "tcp",
                     "containerPort": 80
                }
            ]
        }
    ],
    "requiresCompatibilities": [
        "FARGATE"
    ],
    "networkMode": "awsvpc",
    "cpu": "256",
    "memory": "512",
    "family": "ecs-demo"
}
```

To create an AppSpec file

• The AppSpec file is used for CodeDeploy deployments. The file, which includes optional fields, uses this format:

```
version: 0.0
Resources:
    TargetService:
    Type: AWS::ECS::Service
    Properties:
    TaskDefinition: "task-definition-ARN"
    LoadBalancerInfo:
        ContainerName: "container-name"
```

```
ContainerPort: container-port-number

# Optional properties

PlatformVersion: "LATEST"

NetworkConfiguration:

AwsvpcConfiguration:

Subnets: ["subnet-name-1", "subnet-name-2"]

SecurityGroups: ["security-group"]

AssignPublicIp: "ENABLED"

Hooks:

- BeforeInstall: "BeforeInstallHookFunctionName"

- AfterInstall: "AfterInstallHookFunctionName"

- AfterAllowTestTraffic: "AfterAllowTestTrafficHookFunctionName"

- BeforeAllowTraffic: "BeforeAllowTrafficHookFunctionName"

- AfterAllowTraffic: "AfterAllowTrafficHookFunctionName"
```

For more information about the AppSpec file, including examples, see <u>CodeDeploy AppSpec</u> File Reference.

Create a file named appspec.yaml with the following contents. For TaskDefinition, do not change the <TASK_DEFINITION> placeholder text. This value is updated when your pipeline runs.

```
version: 0.0
Resources:
    TargetService:
    Type: AWS::ECS::Service
    Properties:
    TaskDefinition: <TASK_DEFINITION>
    LoadBalancerInfo:
        ContainerName: "sample-website"
        ContainerPort: 80
```

To push files to your CodeCommit repository

 Push or upload the files to your CodeCommit repository. These files are the source artifact created by the Create pipeline wizard for your deployment action in CodePipeline. Your files should look like this in your local directory:

/tmp |my-demo-repo

```
|-- appspec.yaml
|-- taskdef.json
```

- 2. Choose the method you want to use to upload your files:
 - a. To use your git command line from a cloned repository on your local computer:
 - i. Change directories to your local repository:

```
(For Linux, OS X, or Unix) cd /tmp/my-demo-repo
(For Windows) cd c:\temp\my-demo-repo
```

ii. Run the following command to stage all of your files at once:

```
git add -A
```

iii. Run the following command to commit the files with a commit message:

```
git commit -m "Added task definition files"
```

iv. Run the following command to push the files from your local repo to your CodeCommit repository:

git push

- b. To use the CodeCommit console to upload your files:
 - i. Open the CodeCommit console, and choose your repository from the **Repositories** list.
 - ii. Choose Add file, and then choose Upload file.
 - iii. Choose **Choose file**, and then browse for your file. Commit the change by entering your user name and email address. Choose **Commit changes**.
 - iv. Repeat this step for each file you want to upload.

Step 3: Create your Application Load Balancer and target groups

In this section, you create an Amazon EC2 Application Load Balancer. You use the subnet names and target group values you create with your load balancer later, when you create your Amazon ECS service. You can create an Application Load Balancer or a Network Load Balancer. The load balancer must use a VPC with two public subnets in different Availability Zones. In these steps, you confirm your default VPC, create a load balancer, and then create two target groups for your load balancer. For more information, see Target Groups for Your Network Load Balancers.

To verify your default VPC and public subnets

- 1. Sign in to the Amazon Web Services Management Console and open the Amazon VPC console at https://console.amazonaws.cn/vpc/.
- 2. Verify the default VPC to use. In the navigation pane, choose **Your VPCs**. Note which VPC shows **Yes** in the **Default VPC** column. This is the default VPC. It contains default subnets for you to select.
- 3. Choose **Subnets**. Choose two subnets that show **Yes** in the **Default subnet** column.

Note

Make a note of your subnet IDs. You need them later in this tutorial.

- 4. Choose the subnets, and then choose the **Description** tab. Verify that the subnets you want to use are in different Availability Zones.
- 5. Choose the subnets, and then choose the **Route Table** tab. To verify that each subnet you want to use is a public subnet, confirm that a gateway row is included in the route table.

To create an Amazon EC2 Application Load Balancer

- 1. Sign in to the Amazon Web Services Management Console and open the Amazon EC2 console at https://console.amazonaws.cn/ec2/.
- 2. In the navigation pane, choose **Load Balancers**.
- 3. Choose **Create Load Balancer**.
- 4. Choose Application Load Balancer, and then choose Create.
- 5. In **Name**, enter the name of your load balancer.
- 6. In **Scheme**, choose **internet-facing**.
- 7. In **IP address type**, choose **ipv4**.
- 8. Configure two listener ports for your load balancer:
 - a. Under Load Balancer Protocol, choose HTTP. Under Load Balancer Port, enter 80.
 - b. Choose Add listener.

- c. Under Load Balancer Protocol for the second listener, choose HTTP. Under Load Balancer Port, enter 8080.
- 9. Under **Availability Zones**, in **VPC**, choose the default VPC. Next, choose the two default subnets you want to use.
- 10. Choose Next: Configure Security Settings.
- 11. Choose Next: Configure Security Groups.
- 12. Choose **Select an existing security group**, and make a note of the security group ID.
- 13. Choose Next: Configure Routing.
- 14. In **Target group**, choose **New target group** and configure your first target group:
 - a. In **Name**, enter a target group name (for example, **target-group-1**).
 - b. In **Target type**, choose **IP**.
 - c. In **Protocol** choose **HTTP**. In **Port**, enter **80**.
 - d. Choose Next: Register Targets.
- 15. Choose **Next: Review**, and then choose **Create**.

To create a second target group for your load balancer

- 1. After your load balancer is provisioned, open the Amazon EC2 console. In the navigation pane, choose **Target Groups**.
- 2. Choose Create target group.
- 3. In **Name**, enter a target group name (for example, **target-group-2**).
- 4. In **Target type**, choose **IP**.
- 5. In **Protocol** choose **HTTP**. In **Port**, enter **8080**.
- 6. In **VPC**, choose the default VPC.
- 7. Choose Create.

Note

You must have two target groups created for your load balancer in order for your deployment to run. You only need to make a note of the ARN of your first target group. This ARN is used in the create-service JSON file in the next step.

To update your load balancer to include your second target group

- 1. Open the Amazon EC2 console. In the navigation pane, choose Load Balancers.
- Choose your load balancer, and then choose the Listeners tab. Choose the listener with port 8080, and then choose Edit.
- 3. Choose the pencil icon next to **Forward to**. Choose your second target group, and then choose the check mark. Choose **Update** to save the updates.

Step 4: Create your Amazon ECS cluster and service

In this section, you create an Amazon ECS cluster and service where CodeDeploy routes traffic during deployment (to an Amazon ECS cluster rather than EC2 instances). To create your Amazon ECS service, you must use the subnet names, security group, and target group value you created with your load balancer to create your service.

Note

When you use these steps to create your Amazon ECS cluster, you use the **Networking only** cluster template, which provisions Amazon Fargate containers. Amazon Fargate is a technology that manages your container instance infrastructure for you. You do not need to choose or manually create Amazon EC2 instances for your Amazon ECS cluster.

To create an Amazon ECS cluster

- 1. Open the Amazon ECS classic console at https://console.amazonaws.cn/ecs/.
- 2. In the navigation pane, choose **Clusters**.
- 3. Choose **Create cluster**.
- 4. Choose the **Networking only** cluster template that uses Amazon Fargate, and then choose **Next step**.
- 5. Enter a cluster name on the **Configure cluster** page. You can add an optional tag for your resource. Choose **Create**.

To create an Amazon ECS service

Use the Amazon CLI to create your service in Amazon ECS.

 Create a JSON file and name it create-service.json. Paste the following into the JSON file.

For the taskDefinition field, when you register a task definition in Amazon ECS, you give it a family. This is similar to a name for multiple versions of the task definition, specified with a revision number. In this example, use "ecs-demo:1" for the family and revision number in your file. Use the subnet names, security group, and target group value you created with your load balancer in Step 3: Create your Application Load Balancer and target groups.

Note

You need to include your target group ARN in this file. Open the Amazon EC2 console and from the navigation pane, under **LOAD BALANCING**, choose **Target Groups**. Choose your first target group. Copy your ARN from the **Description** tab.

```
{
    "taskDefinition": "family:revision-number",
    "cluster": "my-cluster",
    "loadBalancers": [
        {
            "targetGroupArn": "target-group-arn",
            "containerName": "sample-website",
            "containerPort": 80
        }
    ],
    "desiredCount": 1,
    "launchType": "FARGATE",
    "schedulingStrategy": "REPLICA",
    "deploymentController": {
        "type": "CODE_DEPLOY"
    },
    "networkConfiguration": {
        "awsvpcConfiguration": {
            "subnets": [
                "subnet-1",
                "subnet-2"
            ],
            "securityGroups": [
                "security-group"
            ],
```

}

```
"assignPublicIp": "ENABLED"
}
}
```

2. Run the **create-service** command, specifying the JSON file:

🛕 Important

Be sure to include file:// before the file name. It is required in this command.

This example creates a service named my-service.

🚯 Note

This example command creates a service named my-service. If you already have a service with this name, the command returns an error.

```
aws ecs create-service --service-name my-service --cli-input-json file://create-
service.json
```

The output returns the description fields for your service.

3. Run the **describe-services** command to verify that your service was created.

aws ecs describe-services --cluster *cluster-name* --services *service-name*

Step 5: Create your CodeDeploy application and deployment group (ECS compute platform)

When you create a CodeDeploy application and deployment group for the Amazon ECS compute platform, the application is used during a deployment to reference the correct deployment group, target groups, listeners, and traffic rerouting behavior.

- 1. Open the CodeDeploy console and choose **Create application**.
- 2. In **Application name**, enter the name you want to use.
- 3. In **Compute platform**, choose **Amazon ECS**.
- 4. Choose **Create application**.

To create a CodeDeploy deployment group

- 1. On your application page's **Deployment groups** tab, choose **Create deployment group**.
- 2. In **Deployment group name**, enter a name that describes the deployment group.
- 3. In **Service role**, choose a service role that grants CodeDeploy access to Amazon ECS. To create a new service role, follow these steps:
 - a. Open the IAM console at https://console.amazonaws.cn/iam/).
 - b. From the console dashboard, choose **Roles**.
 - c. Choose Create role.
 - d. Under Select type of trusted entity, select Amazon Web Services service. Under Choose a use case, select CodeDeploy. Under Select your use case, select CodeDeploy ECS.
 Choose Next: Permissions. The AWSCodeDeployRoleForECS managed policy is already attached to the role.
 - e. Choose **Next: Tags**, and **Next: Review**.
 - f. Enter a name for the role (for example, **CodeDeployECSRole**), and then choose **Create role**.
- 4. In **Environment configuration**, choose your Amazon ECS cluster name and service name.
- 5. From **Load balancers**, choose the name of the load balancer that serves traffic to your Amazon ECS service.
- 6. From **Production listener port**, choose the port and protocol for the listener that serves production traffic to your Amazon ECS service. From **Test listener port**, choose the port and protocol for the test listener.
- 7. From **Target group 1 name** and **Target group 2 name**, choose the target groups used to route traffic during your deployment. Make sure that these are the target groups you created for your load balancer.

- 8. Choose **Reroute traffic immediately** to determine how long after a successful deployment to reroute traffic to your updated Amazon ECS task.
- 9. Choose Create deployment group.

Step 6: Create your pipeline

In this section, you create a pipeline with the following actions:

- A CodeCommit action where the source artifacts are the task definition and the AppSpec file.
- A source stage with an Amazon ECR source action where the source artifact is the image file.
- A deployment stage with an Amazon ECS deploy action where the deployment runs with a CodeDeploy application and deployment group.

To create a two-stage pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyImagePipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
- 7. Leave the settings under Advanced settings at their defaults, and then choose Next.
- In Step 3: Add source stage, in Source provider, choose Amazon CodeCommit. In Repository name, choose the name of the CodeCommit repository you created in <u>Step 1: Create a</u> <u>CodeCommit repository</u>. In Branch name, choose the name of the branch that contains your latest code update.

Choose Next.

9. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.

10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. In Step 6: Add deploy stage:
 - a. In Deploy provider, choose Amazon ECS (Blue/Green). In Application name, enter or choose the application name from the list, such as codedeployapp. In Deployment group, enter or choose the deployment group name from the list, such as codedeploydeplgroup.

1 Note

The name "Deploy" is the name given by default to the stage created in the **Step 4: Deploy** step, just as "Source" is the name given to the first stage of the pipeline.

- b. Under Amazon ECS task definition, choose SourceArtifact. In the field, enter taskdef.json.
- c. Under Amazon CodeDeploy AppSpec file, choose SourceArtifact. In the field, enter appspec.yaml.

🚯 Note

At this point, do not fill in any information under **Dynamically update task definition image**.

d. Choose **Next**.

12. In **Step 7: Review**, review the information, and then choose **Create pipeline**.

To add an Amazon ECR source action to your pipeline

View your pipeline and add an Amazon ECR source action to your pipeline.

- 1. Choose your pipeline. In the upper left, choose **Edit**.
- 2. In the source stage, choose Edit stage.
- 3. Add a parallel action by choosing + Add action next to your CodeCommit source action.
- 4. In **Action name**, enter a name (for example, **Image**).

5. In Action provider, choose Amazon ECR.

Edit action	
Action name Choose a name for your action	
Image	
No more than 100 characters	
Action provider	
Amazon ECR	▼
Amazon ECR Repository name Choose an Amazon ECR repository as the s	
nginx 🔻	Create repository
Q	ipeline when a change occurs in the image repository.
If an image tag is not selected, defaults to	/ LOLCSL
If an image tag is not selected, defaults to Output artifacts Choose a name for the output of this actic	
Output artifacts	

- 6. In **Repository name**, choose the name of your Amazon ECR repository.
- 7. In Image tag, specify the image name and version, if different from latest.
- 8. In **Output artifacts**, choose the output artifact default (for example, MyImage) that contains the image name and repository URI information you want the next stage to use.
- 9. Choose **Save** on the action screen. Choose **Done** on the stage screen. Choose **Save** on the pipeline. A message shows the Amazon CloudWatch Events rule to be created for the Amazon ECR source action.

To wire your source artifacts to the deploy action

1. Choose **Edit** on your Deploy stage and choose the icon to edit the **Amazon ECS (Blue/Green)** action.

- 2. Scroll to the bottom of the pane. In **Input artifacts**, choose **Add**. Add the source artifact from your new Amazon ECR repository (for example, MyImage).
- 3. In **Task Definition**, choose **SourceArtifact**, and then verify **taskdef.json** is entered.
- 4. In **Amazon CodeDeploy AppSpec File**, choose **SourceArtifact**, and then verify **appspec.yaml** is entered.
- In Dynamically update task definition image, in Input Artifact with Image URI, choose MyImage, and then enter the placeholder text that is used in the taskdef.json file: IMAGE1_NAME. Choose Save.
- 6. In the Amazon CodePipeline pane, choose **Save pipeline change**, and then choose **Save change**. View your updated pipeline.

After this example pipeline is created, the action configuration for the console entries appears in the pipeline structure as follows:

```
"configuration": {
    "AppSpecTemplateArtifact": "SourceArtifact",
    "AppSpecTemplatePath": "appspec.yaml",
    "TaskDefinitionTemplateArtifact": "SourceArtifact",
    "TaskDefinitionTemplatePath": "taskdef.json",
    "ApplicationName": "codedeployapp",
    "DeploymentGroupName": "codedeploydeplgroup",
    "Image1ArtifactName": "MyImage",
    "Image1ContainerName": "IMAGE1_NAME"
},
```

- 7. To submit your changes and start a pipeline build, choose **Release change**, and then choose **Release**.
- 8. Choose the deployment action to view it in CodeDeploy and see the progress of the traffic shifting.

🚺 Note

You might see a deployment step that shows an optional wait time. By default, CodeDeploy waits one hour after a successful deployment before it terminates the original task set. You can use this time to roll back or terminate the task, but your deployment otherwise completes when the task set is terminated.

Step 7: Make a change to your pipeline and verify deployment

Make a change to your image and then push the change to your Amazon ECR repository. This triggers your pipeline to run. Verify that your image source change is deployed.

Tutorial: Create a pipeline that deploys an Amazon Alexa skill

In this tutorial, you configure a pipeline that continuously delivers your Alexa skill using the Alexa Skills Kit as the deployment provider in your deployment stage. The completed pipeline detects changes to your skill when you make a change to the source files in your source repository. The pipeline then uses the Alexa Skills Kit to deploy to the Alexa skill development stage.

A Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🚺 Note

This feature is not available in the Asia Pacific (Hong Kong) or Europe (Milan) Region. To use other deploy actions available in that Region, see <u>Deploy action integrations</u>.

To create your custom skill as a Lambda function, see <u>Host a Custom Skill as an Amazon Lambda</u> <u>Function</u>. You can also create a pipeline that uses Lambda source files and a CodeBuild project to deploy changes to Lambda for your skill.

Prerequisites

You must already have the following:

• A CodeCommit repository. You can use the Amazon CodeCommit repository you created in Tutorial: Create a simple pipeline (CodeCommit repository).

- An Amazon developer account. This is the account that owns your Alexa skills. You can create an account for free at Alexa Skills Kit.
- An Alexa skill. You can create a sample skill using the <u>Get Custom Skill Sample Code</u> tutorial.
- Install the ASK CLI and configure it using ask init with your Amazon credentials. See Install and initialize ASK CLI.

Step 1: Create an Alexa developer services LWA security profile

In this section, you create a security profile to use with Login with Amazon (LWA). If you already have a profile, you can skip this step.

- Use the steps in generate-lwa-tokens to create a Security Profile.
- After you create the profile, make a note of the **Client ID** and **Client Secret**.
- Make sure you enter the **Allowed Return URLs** as provided in the instructions. The URLs allow the ASK CLI command to redirect refresh token requests.

Step 2: Create Alexa skill source files and push to your CodeCommit repository

In this section, you create and push your Alexa skill source files to the repository that the pipeline uses for your source stage. For the skill you have created in the Amazon developer console, you produce and push the following:

- A skill.json file.
- An interactionModel/custom folder.

🚯 Note

This directory structure complies with Alexa Skills Kit skill package format requirements, as outlined in <u>Skill package format</u>. If your directory structure does not use the correct skill package format, changes do not successfully deploy to the Alexa Skills Kit console.

To create source files for your skill

1. Retrieve your skill ID from the Alexa Skills Kit developer console. Use this command:

ask api list-skills

Locate your skill by name and then copy the associated ID in the skillid field.

2. Generate a skill.json file that contains your skill details. Use this command:

ask api get-skill -s skill-ID > skill.json

3. (Optional) Create an interactionModel/custom folder.

Use this command to generate the interaction model file within the folder. For locale, this tutorial uses en-US as the locale in the file name.

```
ask api get-model --skill-id skill-ID --locale locale >
    ./interactionModel/custom/locale.json
```

To push files to your CodeCommit repository

 Push or upload the files to your CodeCommit repository. These files are the source artifact created by the Create Pipeline wizard for your deployment action in Amazon CodePipeline. Your files should look like this in your local directory:

```
skill.json
/interactionModel
/custom
|en-US.json
```

- 2. Choose the method you want to use to upload your files:
 - a. To use the Git command line from a cloned repository on your local computer:
 - i. Run the following command to stage all of your files at once:

```
git add -A
```

ii. Run the following command to commit the files with a commit message:

git commit -m "Added Alexa skill files"

iii. Run the following command to push the files from your local repo to your CodeCommit repository:

git push

- b. To use the CodeCommit console to upload your files:
 - i. Open the CodeCommit console, and choose your repository from the **Repositories** list.
 - ii. Choose Add file, and then choose Upload file.
 - iii. Choose **Choose file**, and then browse for your file. Commit the change by entering your user name and email address. Choose **Commit changes**.
 - iv. Repeat this step for each file you want to upload.

Step 3: Use ASK CLI commands to create a refresh token

CodePipeline uses a refresh token based on the client ID and secret in your Amazon developer account to authorize actions it performs on your behalf. In this section, you use the ASK CLI to create the token. You use these credentials when you use the **Create Pipeline** wizard.

To create a refresh token with your Amazon developer account credentials

1. Use the following command:

ask util generate-lwa-tokens

2. When prompted, enter your client ID and secret as shown in this example:

```
? Please type in the client ID:
amzn1.application-client.example112233445566
? Please type in the client secret:
example112233445566
```

- 3. The sign-in browser page displays. Sign in with your Amazon developer account credentials.
- 4. Return to the command line screen. The access token and refresh token are generated in the output. Copy the refresh token returned in the output.

Step 4: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with a CodeCommit action where the source artifacts are the Alexa skill files that support your skill.
- A deployment stage with an Alexa Skills Kit deploy action.

To create a pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. Choose the Amazon Region where you want to create the project and its resources. The Alexa skill runtime is available only in the following Regions:
 - Asia Pacific (Tokyo)
 - Europe (Ireland)
 - US East (N. Virginia)
 - US West (Oregon)
- 3. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 4. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 5. In Step 2: Choose pipeline settings, in Pipeline name, enter MyAlexaPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 7. In Service role, choose New service role to allow CodePipeline to create a service role in IAM.
- 8. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 9. In Step 3: Add source stage, in Source provider, choose Amazon CodeCommit. In Repository name, choose the name of the CodeCommit repository you created in <u>Step 1: Create a</u> <u>CodeCommit repository</u>. In Branch name, choose the name of the branch that contains your latest code update.

After you select the repository name and branch, a message shows the Amazon CloudWatch Events rule to be created for this pipeline.

Choose Next.

10. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

11. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 12. In Step 6: Add deploy stage:
 - a. In **Deploy provider**, choose **Alexa Skills Kit**.
 - b. In **Alexa skill ID**, enter the skill ID assigned to your skill in the Alexa Skills Kit developer console.
 - c. In **Client ID**, enter the ID of the application you registered.
 - d. In **Client secret**, enter the secret you chose when you registered.
 - e. In **Refresh token**, enter the token you generated in step 3.

You cannot skip this stage Pipelines must have at least two stages. Your second stage must be either a build or deployment stage. Choose a provider for either the build stage or deployment stage.		
Deplo	у	
Choose h	provider now you deploy to instances. Choose the provider, and then provide the configuration details for that provider. Skills Kit	
Alexa S	skills Kit	
Alexa sk The uniq	kill ID ue identifier of the skill.	
amzn	1.ask.skill.da55cd70-9eaf-4cf1-b326-i	
Client II The clien page.	D t ID of the application registered for LWA (Login With Amazon). Look for this on the Alexa Skills Kit developer portal LWA	
amzn	1.application-oa2-client.e	
Client se The clien LWA pag	t secret of the application registered for LWA (Login With Amazon). Look for this on the Alexa Skills Kit developer portal	
Refresh The refre	token sh token used to request new access tokens.	
1		
	Cancel Previous Next	

f. Choose **Next**.

13. In **Step 7: Review**, review the information, and then choose **Create pipeline**.

Step 5: Make a change to any source file and verify deployment

Make a change to your skill and then push the change to your repository. This triggers your pipeline to run. Verify that your skill is updated in the Alexa Skills Kit developer console.

Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider

In this tutorial, you configure a pipeline that continuously delivers files using Amazon S3 as the deployment action provider in your deployment stage. The completed pipeline detects changes when you make a change to the source files in your source repository. The pipeline then uses

Amazon S3 to deploy the files to your bucket. Each time you modify or add your website files in your source location, the deployment creates the website with your latest files.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

🚺 Note

Even if you delete files from the source repository, the S3 deploy action does not delete S3 objects corresponding to deleted files.

This tutorial provides two options:

- Create a pipeline that deploys a static website to your S3 public bucket. This example creates a
 pipeline with an Amazon CodeCommit source action and an Amazon S3 deployment action. See
 Option 1: Deploy static website files to Amazon S3.
- Create a pipeline that compiles sample TypeScript code into JavaScript and deploys the CodeBuild output artifact to your S3 bucket for archive. This example creates a pipeline with an Amazon S3 source action, a CodeBuild build action, and an Amazon S3 deployment action. See Option 2: Deploy built archive files to Amazon S3 from an S3 source bucket.

<u> Important</u>

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region. You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see Add a cross-Region action in CodePipeline.

Option 1: Deploy static website files to Amazon S3

In this example, you download the sample static website template file, upload the files to your Amazon CodeCommit repository, create your bucket, and configure it for hosting. Next, you use the Amazon CodePipeline console to create your pipeline and specify an Amazon S3 deployment configuration.

Prerequisites

You must already have the following:

- A CodeCommit repository. You can use the Amazon CodeCommit repository you created in Tutorial: Create a simple pipeline (CodeCommit repository).
- Source files for your static website. Use this link to download a <u>sample static website</u>. The sample-website.zip download produces the following files:
 - An index.html file
 - A main.css file
 - A graphic.jpg file
- An S3 bucket configured for website hosting. See <u>Hosting a static website on Amazon S3</u>. Make sure you create your bucket in the same Region as the pipeline.

1 Note

To host a website, your bucket must have public read access, which gives everyone read access. With the exception of website hosting, you should keep the default access settings that block public access to S3 buckets.

Step 1: Push source files to your CodeCommit repository

In this section, push your source files to the repository that the pipeline uses for your source stage.

To push files to your CodeCommit repository

- 1. Extract the downloaded sample files. Do not upload the ZIP file to your repository.
- Push or upload the files to your CodeCommit repository. These files are the source artifact created by the Create Pipeline wizard for your deployment action in CodePipeline. Your files should look like this in your local directory:

```
index.html
main.css
graphic.jpg
```

- 3. You can use Git or the CodeCommit console to upload your files:
 - a. To use the Git command line from a cloned repository on your local computer:
 - i. Run the following command to stage all of your files at once:

git add -A

ii. Run the following command to commit the files with a commit message:

git commit -m "Added static website files"

iii. Run the following command to push the files from your local repo to your CodeCommit repository:

```
git push
```

- b. To use the CodeCommit console to upload your files:
 - i. Open the CodeCommit console, and choose your repository from the **Repositories** list.
 - ii. Choose Add file, and then choose Upload file.
 - iii. Select **Choose file**, and then browse for your file. Commit the change by entering your user name and email address. Choose **Commit changes**.
 - iv. Repeat this step for each file you want to upload.

Step 2: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with a CodeCommit action where the source artifacts are the files for your website.
- A deployment stage with an Amazon S3 deployment action.

To create a pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, **Getting started** page, or **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyS3DeployPipeline.
- 5. In **Pipeline type**, choose **V2**. For more information, see <u>Pipeline types</u>. Choose **Next**.
- 6. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
- 7. Leave the settings under Advanced settings at their defaults, and then choose Next.
- 8. In Step 3: Add source stage, in Source provider, choose Amazon CodeCommit. In Repository name, choose the name of the CodeCommit repository you created in <u>Step 1: Create a</u> <u>CodeCommit repository</u>. In Branch name, choose the name of the branch that contains your latest code update. Unless you created a different branch on your own, only main is available.

After you select the repository name and branch, the Amazon CloudWatch Events rule to be created for this pipeline is displayed.

Choose Next.

9. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

11. In Step 6: Add deploy stage:

- a. In **Deploy provider**, choose **Amazon S3**.
- b. In **Bucket**, enter the name of your public bucket.
- c. Select Extract file before deploy.

🚯 Note

The deployment fails if you do not select **Extract file before deploy**. This is because the Amazon CodeCommit action in your pipeline zips source artifacts and your file is a ZIP file.

When **Extract file before deploy** is selected, **Deployment path** is displayed. Enter the name of the path you want to use. This creates a folder structure in Amazon S3 to which the files are extracted. For this tutorial, leave this field blank.

Deploy - optional
Deploy provider Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider. Amazon \$3
Amazon S3
Specify your Amazon S3 location.
Bucket
my-codepipeline-website-bucket
Deployment path - optional
Extract file before deploy The deployed artifact will be unzipped before deployment.
Additional configuration
Cancel Previous Skip deploy stage Mext

d. (Optional) In Canned ACL, you can apply a set of predefined grants, known as a <u>canned</u> <u>ACL</u>, to the uploaded artifacts.

- e. (Optional) In **Cache control**, enter the caching parameters. You can set this to control caching behavior for requests/responses. For valid values, see the <u>Cache-Control</u> header field for HTTP operations.
- f. Choose **Next**.
- 12. In Step 7: Review, review the information, and then choose Create pipeline.
- 13. After your pipeline runs successfully, open the Amazon S3 console and verify that your files appear in your public bucket as shown:

index.html main.css graphic.jpg

14. Access your endpoint to test the website. Your endpoint follows this format: http://bucket-name.s3-website-region.amazonaws.com/.

Example endpoint: http://my-bucket.s3-website-us-west-2.amazonaws.com/.

The sample web page appears.

Step 3: Make a change to any source file and verify deployment

Make a change to your source files and then push the change to your repository. This triggers your pipeline to run. Verify that your website is updated.

Option 2: Deploy built archive files to Amazon S3 from an S3 source bucket

In this option, the build commands in your build stage compile TypeScript code into JavaScript code and deploy the output to your S3 target bucket under a separate timestamped folder. First, you create TypeScript code and a buildspec.yml file. After you combine the source files in a ZIP file, you upload the source ZIP file to your S3 source bucket, and use a CodeBuild stage to deploy a built application ZIP file to your S3 target bucket. The compiled code is retained as an archive in your target bucket.

Prerequisites

You must already have the following:

- An S3 source bucket. You can use the bucket you created in <u>Tutorial: Create a simple pipeline (S3</u> bucket).
- An S3 target bucket. See <u>Hosting a static website on Amazon S3</u>. Make sure you create your bucket in the same Amazon Web Services Region as the pipeline you want to create.

Note

This example demonstrates deploying files to a private bucket. Do not enable your target bucket for website hosting or attach any policies that make the bucket public.

Step 1: Create and upload source files to your S3 source bucket

In this section, you create and upload your source files to the bucket that the pipeline uses for your source stage. This section provides instructions for creating the following source files:

- A buildspec.yml file, which is used for CodeBuild build projects.
- An index.ts file.

To create a buildspec.yml file

• Create a file named buildspec.yml with the following contents. These build commands install TypeScript and use the TypeScript compiler to rewrite the code in index.ts to JavaScript code.

```
version: 0.2
phases:
    install:
        commands:
            - npm install -g typescript
    build:
        commands:
            - tsc index.ts
artifacts:
    files:
        - index.js
```

To create an index.ts file

• Create a file named index.ts with the following contents.

```
interface Greeting {
    message: string;
}
class HelloGreeting implements Greeting {
    message = "Hello!";
}
function greet(greeting: Greeting) {
    console.log(greeting.message);
}
let greeting = new HelloGreeting();
greet(greeting);
```

To upload files to your S3 source bucket

1. Your files should look like this in your local directory:

```
buildspec.yml
index.ts
```

Zip the files and name the file source.zip.

- 2. In the Amazon S3 console, for your source bucket, choose **Upload**. Choose **Add files**, and then browse for the ZIP file you created.
- 3. Choose **Upload**. These files are the source artifact created by the **Create Pipeline** wizard for your deployment action in CodePipeline. Your file should look like this in your bucket:

source.zip

Step 2: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with an Amazon S3 action where the source artifacts are the files for your downloadable application.
- A deployment stage with an Amazon S3 deployment action.

To create a pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.
- 2. On the **Welcome** page, **Getting started** page, or **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyS3DeployPipeline.
- 5. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
- 6. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 7. In **Step 3: Add source stage**, in **Source provider**, choose **Amazon S3**. In **Bucket**, choose the name of your source bucket. In **S3 object key**, enter the name of your source ZIP file. Make sure you include the .zip file extension.

Choose Next.

- 8. In Step 4: Add build stage:
 - a. In **Build provider**, choose **CodeBuild**.
 - b. Choose **Create build project**. On the **Create project** page:
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For Runtime, choose Standard. For Runtime version, choose aws/codebuild/ standard:1.0.
 - f. In Image version, choose Always use the latest image for this runtime version.
 - g. For **Service role**, choose your CodeBuild service role, or create one.
 - h. For **Build specifications**, choose **Use a buildspec file**.
 - i. Choose **Continue to CodePipeline**. A message is displayed if the project was created successfully.
 - j. Choose **Next**.
- 9. In **Step 5: Add deploy stage**:

- a. In **Deploy provider**, choose **Amazon S3**.
- b. In **Bucket**, enter the name of your S3 target bucket.
- c. Make sure that **Extract file before deploy** is cleared.

When **Extract file before deploy** is cleared, **S3 object key** is displayed. Enter the name of the path you want to use: js-application/{datetime}.zip.

This creates a js-application folder in Amazon S3 to which the files are extracted. In this folder, the {datetime} variable creates a timestamp on each output file when your pipeline runs.

Add deploy stage
Deploy - optional
Deploy provider Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider.
Amazon S3
Amazon S3
Specify your Amazon S3 location.
Bucket
my-codepipeline-website-bucket
S3 object key
js-application/{datetime}.zip
Extract file before deploy The deployed artifact will be unzipped before deployment.
Additional configuration

- d. (Optional) In **Canned ACL**, you can apply a set of predefined grants, known as a <u>canned</u> ACL, to the uploaded artifacts.
- e. (Optional) In **Cache control**, enter the caching parameters. You can set this to control caching behavior for requests/responses. For valid values, see the <u>Cache-Control</u> header field for HTTP operations.
- f. Choose **Next**.
- 10. In **Step 6: Review**, review the information, and then choose **Create pipeline**.

11. After your pipeline runs successfully, view your bucket in the Amazon S3 console. Verify that your deployed ZIP file is displayed in your target bucket under the js-application folder. The JavaScript file contained in the ZIP file should be index.js. The index.js file contains the following output:

```
var HelloGreeting = /** @class */ (function () {
    function HelloGreeting() {
        this.message = "Hello!";
    }
    return HelloGreeting;
}());
function greet(greeting) {
    console.log(greeting.message);
}
var greeting = new HelloGreeting();
greet(greeting);
```

Step 3: Make a change to any source file and verify deployment

Make a change to your source files and then upload them to your source bucket. This triggers your pipeline to run. View your target bucket and verify that the deployed output files are available in the js-application folder as shown:

Amazon S3 > my-codepipeline-website-bucket > js-ap	plication
Overview	
Q Type a prefix and press Enter to search. Press ESC to clear.	
▲ Upload	~ >
	<u> </u>
□ Name ▼	Last moc
2019-01-10_07-28-07.zip	Jan 9, 2 ₅₅ GMT-080
32019-01-10_07-39-57.zip	Jan 9, 20

Tutorial: Create a pipeline that publishes your serverless application to the Amazon Serverless Application Repository

You can use Amazon CodePipeline to continuously deliver your Amazon SAM serverless application to the Amazon Serverless Application Repository.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

This tutorial shows how to create and configure a pipeline to build your serverless application that is hosted in GitHub and publish it to the Amazon Serverless Application Repository automatically. The pipeline uses GitHub as the source provider and CodeBuild as the build provider. To publish your serverless application to the Amazon Serverless Application Repository, you deploy an <u>application</u> (from the Amazon Serverless Application Repository) and associate the Lambda function created by that application as an Invoke action provider in your pipeline. Then you can continuously deliver application updates to the Amazon Serverless Application Repository, without writing any code.

<u> Important</u>

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region.

You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see Add a cross-Region action in CodePipeline.

Before you begin

In this tutorial, we assume the following.

- You are familiar with <u>Amazon Serverless Application Model (Amazon SAM)</u> and the <u>Amazon</u> Serverless Application Repository.
- You have a serverless application hosted in GitHub that you have published to the Amazon Serverless Application Repository using the Amazon SAM CLI. To publish an example application to the Amazon Serverless Application Repository, see <u>Quick Start: Publishing Applications</u> in the *Amazon Serverless Application Repository Developer Guide*. To publish your own application to the Amazon Serverless Application Repository, see <u>Publishing Applications Using the Amazon SAM</u> <u>CLI</u> in the *Amazon Serverless Application Model Developer Guide*.

Step 1: Create a buildspec.yml file

Create a buildspec.yml file with the following contents, and add it to your serverless application's GitHub repository. Replace *template.yml* with your application's Amazon SAM template and *bucketname* with the S3 bucket where your packaged application is stored.

```
phases:
    install:
    runtime-versions:
        python: 3.8
    build:
        commands:
            - sam package --template-file template.yml --s3-bucket bucketname --output-
template-file packaged-template.yml
artifacts:
    files:
        - packaged-template.yml
```

Step 2: Create and configure your pipeline

Follow these steps to create your pipeline in the Amazon Web Services Region where you want to publish your serverless application.

- Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.
- 2. If necessary, switch to the Amazon Web Services Region where you want to publish your serverless application.
- 3. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 4. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 5. Choose **Create pipeline**. On the **Step 2: Choose pipeline settings** page, in **Pipeline name**, enter the name for your pipeline.
- 6. In **Pipeline type**, choose **V2**. For more information, see <u>Pipeline types</u>. Choose **Next**.
- 7. In Service role, choose New service role to allow CodePipeline to create a service role in IAM.
- 8. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 9. On the **Step 3: Add source stage** page, in **Source provider**, choose **GitHub**.
- 10. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
- 11. In **Repository**, choose your GitHub source repository.
- 12. In **Branch**, choose your GitHub branch.
- 13. Leave the remaining defaults for the source action. Choose **Next**.
- 14. On the Step 4: Add build stage page, add a build stage:

- a. In **Build provider**, choose **Amazon CodeBuild**. For **Region**, use the pipeline Region.
- b. Choose Create project.
- c. In **Project name**, enter a name for this build project.
- d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
- e. For **Runtime** and **Runtime version**, choose the runtime and version required for your serverless application.
- f. For Service role, choose New service role.
- g. For **Build specifications**, choose **Use a buildspec file**.
- h. Choose Continue to CodePipeline. This opens the CodePipeline console and creates a CodeBuild project that uses the buildspec.yml in your repository for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Choose Next.
- 15. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 16. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 17. On Step 7: Review, choose Create pipeline. You should see a diagram that shows the stages.
- 18. Grant the CodeBuild service role permission to access the S3 bucket where your packaged application is stored.
 - a. In the **Build** stage of your new pipeline, choose **CodeBuild**.
 - b. Choose the **Build details** tab.
 - c. In **Environment**, choose the CodeBuild service role to open the IAM console.
 - d. Expand the selection for CodeBuildBasePolicy, and choose **Edit policy**.
 - e. Choose **JSON**.
 - f. Add a new policy statement with the following contents. The statement allows CodeBuild to put objects into the S3 bucket where your packaged application is stored. Replace *bucketname* with the name of your S3 bucket.

```
"Effect": "Allow",
"Resource": [
         "arn:aws:s3:::bucketname/*"
],
"Action": [
         "s3:PutObject"
]
}
```

- g. Choose **Review policy**.
- h. Choose Save changes.

Step 3: Deploy the publish application

Follow these steps to deploy the application that contains the Lambda function that performs the publish to the Amazon Serverless Application Repository. This application is **aws-serverless-codepipeline-serverlessrepo-publish**.

🚯 Note

You must deploy the application to the same Amazon Web Services Region as your pipeline.

- 1. Go to the application page, and choose **Deploy**.
- 2. Select I acknowledge that this app creates custom IAM roles.
- 3. Choose **Deploy**.
- 4. Choose **View Amazon CloudFormation Stack** to open the Amazon CloudFormation console.
- Expand the Resources section. You see ServerlessRepoPublish, which is of the type AWS::Lambda::Function. Make a note of the physical ID of this resource for the next step. You use this physical ID when you create the new publish action in CodePipeline.

Step 4: Create the publish action

Follow these steps to create the publish action in your pipeline.

1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

- 2. In the left navigation section, choose the pipeline that you want to edit.
- 3. Choose **Edit**.
- 4. After the last stage of your current pipeline, choose **+ Add stage**. In **Stage name** enter a name, such as **Publish**, and choose **Add stage**.
- 5. In the new stage, choose **+ Add action group**.
- 6. Enter an action name. From Action provider, in Invoke, choose Amazon Lambda.
- 7. From Input artifacts, choose BuildArtifact.
- 8. From **Function name**, choose the physical ID of the Lambda function that you noted in the previous step.
- 9. Choose **Save** for the action.
- 10. Choose **Done** for the stage.
- 11. In the upper right, choose **Save**.
- 12. To verify your pipeline, make a change to your application in GitHub. For example, change the application's description in the Metadata section of your Amazon SAM template file. Commit the change and push it to your GitHub branch. This triggers your pipeline to run. When the pipeline is complete, check that your application has been updated with your change in the <u>Amazon Serverless Application Repository</u>.

Tutorial: Lambda function deployments with CodePipeline

This tutorial helps you to create a deploy action in CodePipeline that deploys your code to your function you have configured in Lambda. You will create a sample Lambda function where you will create an alias and version, add the zipped Lambda function to your source location, and run the Lambda action in your pipeline.

🚯 Note

As part of creating a pipeline in the console, an S3 artifact bucket will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

í) Note

The Lambda deploy action is only available for V2 type pipelines.

Prerequisites

There are a few resources that you must have in place before you can use this tutorial to create your CD pipeline. Here are the things you need to get started:

🚯 Note

All of these resources should be created within the same Amazon Region.

- A source control repository, such as GitHub, or a source S3 bucket (this tutorial uses S3) where you will store a .zip file that you create for your Lambda function.
- You must use an existing CodePipeline service role that has been updated with the permissions for this action. To update your service role, see <u>Service role policy permissions for the Lambda</u> <u>deploy action</u>.

After you have satisfied these prerequisites, you can proceed with the tutorial and create your CD pipeline.

Step 1: Create your sample Lambda function

In this step, you create the Lambda function where you will deploy.

To create your Lambda function

- 1. Access the Lambda console and follow the steps in the following tutorial to create a sample Lambda function: link.
- 2. From the top navigation, choose **Create**, and select **Start from scratch** from the top of the page.
- 3. In Name, enter MyLambdaFunction.
- 4. Publish a new version. This will be the version that the alias will point to.
 - a. Select your function.

- b. Choose the Actions dropdown.
- c. Choose **Publish new version**.
- d. (Optional) Add to the description in **Description**.
- e. Choose **Publish**.
- 5. Create an alias for your function, such as aliasV1.
- 6. Make sure the alias is pointing to the version that you just created (such as 1).

Note

If you choose \$LATEST, you cannot use traffic shifting features because Lambda does not support \$LATEST for an alias pointing to more than 1 version.

Step 2: Upload the function file to your repository

Download the function and save it as a zip file. Upload the zipped file to your S3 bucket using the following steps.

To add a .zip file to your source repository

- 1. Open your S3 bucket.
- 2. Choose Upload.
- 3. Upload the zip file containing your sample_lambda_source.zip file to your source bucket.

Make a note of the path.

object key

Step 3: Creating your pipeline

Use the CodePipeline wizard to create your pipeline stages and connect your source repository.

To create your pipeline

- 1. Open the CodePipeline console at <u>https://consol</u>e.amazonaws.cn/codepipeline/.
- 2. On the Welcome page, Getting started page, or the Pipelines page, choose Create pipeline.

- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, choose **Use existing service role**, and then choose the CodePipeline service role that has been updated with the required permissions for this action. To configure your CodePipeline service role for this action, see <u>Service role policy permissions for the Lambda deploy action</u>.
- 7. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **Amazon S3**.
 - b. In **Object key**, add the name of your .zip file, including the file extension, such as sample_lambda_source.zip.

Choose Next.

- 9. On the **Step 4: Add build stage** page, choose **Skip**.
- 10. On the **Step 5: Add test stage** page, choose **Skip**.
- 11. On the **Step 6: Add deploy stage** page, choose **Lambda**.

Edit action	×
Action name	
Choose a name for your action	
Deploy	
No more than 100 characters	,
Action provider	
AWS Lambda 🔻	
Region	
United States (N. Virginia)	
Input artifacts	
Choose an input artifact for this action. Learn more [
▼	
SourceArtifact ×	
Defined by: Source	
No more than 100 characters	
Function name	
Choose a function that you have already created in the AWS Lambda console. Or create a function in the AWS Lambda co	onsole and then return to this task.
Q MyLambdaFunction X	
Function alias	
Choose an alias of the Lambda Function to be deployed to, such as live. The alias must exist and have a version behind it be the rollback target version). If not provided, action deploys source artifact to \$LATEST and creates a new version. In the version options are not available.	

Q aliasV1

Deploy strategy

Choose the rate at which the Lambda deploy action adopts to shift traffic from the original version of the Lambda function to the new version.

Canary deployment	•
Traffic Percentage	
Percentage of traffic to shift in each increment (1-100)	
10	
Time interval (minutes)	
Time between traffic shifts	

Alarms

A list of alarm names configured for the lambda deployment. A maximum of 10 alarms can be added. The Lambda deploy action fails when any monitored alarm goes into alarm state.

CloudWatch Alarms

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- a. Add your function name and alias.
- b. Choose your deploy strategy.
- c. Choose Next.
- 12. On the **Step 7: Review** page, review your pipeline configuration and choose **Create pipeline** to create the pipeline.

⊘ Source	\rightarrow	🕑 Deploy	÷
15ed8bad-3414-49e7-b67d-	റ്	15ed8bad-3414-49e7-b67d-7	
All actions succeeded.		All actions succeeded.	
Source		Deploy	
Amazon S3 Z 2 minutes ago		🐼 AWS Lambda 🗹	
		<u>2 minutes ago</u>	
Source: Amazon S3 ••••		Source: Amazon S3 ••••	

Step 4: Test Your Pipeline

Your pipeline should have everything for running an end-to-end native Amazon continuous deployment. Now, test its functionality by pushing a code change to your source repository.

To test your pipeline

- 1. Make a code change to your configured source repository, commit, and push the change.
- 2. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 3. Choose your pipeline from the list.
- 4. Watch the pipeline progress through its stages. Your pipeline should complete and your action deploys to your Lambda function.

Learn more

The Lambda deploy action allows two methods of deployment. One method is traffic shifting alone without an input artifact from the source action. The other method is updating function code using an input artifact from the source action, then publishing a new version based on the updated code. For the second method, if the alias is provided, CodePipeline will do the traffic shifting as well. This Lambda deploy action tutorial demonstrates updating your function using a source artifact.

To learn more about the action, see the action reference page at <u>Amazon Lambda deploy action</u> reference.

Tutorial: Using variables with Lambda invoke actions

A Lambda invoke action can use variables from another action as part of its input and return new variables along with its output. For information about variables for actions in CodePipeline, see Variables reference.

🛕 Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

At the end of this tutorial, you will have:

- A Lambda invoke action that:
 - Consumes the CommitId variable from a CodeCommit source action
 - Outputs three new variables: dateTime, testRunId, and region
- A manual approval action that consumes the new variables from your Lambda invoke action to provide a test URL and a test run ID
- A pipeline updated with the new actions

Topics

• Prerequisites

- Step 1: Create a Lambda function
- Step 2: Add a Lambda invoke action and manual approval action to your pipeline

Prerequisites

Before you begin, you must have the following:

- You can create or use the pipeline with the CodeCommit source in <u>Tutorial: Create a simple</u> pipeline (CodeCommit repository).
- Edit your existing pipeline so that the CodeCommit source action has a namespace. Assign the namespace SourceVariables to the action.

Step 1: Create a Lambda function

Use the following steps to create a Lambda function and a Lambda execution role. You add the Lambda action to your pipeline after you create the Lambda function.

To create a Lambda function and execution role

- 1. Sign in to the Amazon Web Services Management Console and open the Amazon Lambda console at https://console.amazonaws.cn/lambda/.
- 2. Choose Create function. Leave Author from scratch selected.
- 3. In **Function name**, enter the name of your function, such as **myInvokeFunction**. In **Runtime**, leave the default option selected.
- 4. Expand Choose or create an execution role. Choose Create a new role with basic Lambda permissions.
- 5. Choose **Create function**.
- 6. To use a variable from another action, it will have to be passed to the UserParameters in the Lambda invoke action configuration. You will be configuring the action in our pipeline later in the tutorial, but you will add the code assuming the variable will be passed.

To produce new variables, set a property called outputVariables on the input to putJobSuccessResult. Note that you cannot produce variables as part of a putJobFailureResult.

```
const putJobSuccess = async (message) => {
```

```
const params = {
    jobId: jobId,
    outputVariables: {
        testRunId: Math.floor(Math.random() * 1000).toString(),
        dateTime: Date(Date.now()).toString(),
        region: lambdaRegion
    }
};
```

In your new function, on the **Code** tab, paste the following example code under index.mjs.

```
import { CodePipeline } from '@aws-sdk/client-codepipeline';
export const handler = async (event, context) => {
    const codepipeline = new CodePipeline({});
   // Retrieve the Job ID from the Lambda action
   const jobId = event["CodePipeline.job"].id;
   // Retrieve UserParameters
    const params =
 event["CodePipeline.job"].data.actionConfiguration.configuration.UserParameters;
   // The region from where the lambda function is being executed
    const lambdaRegion = process.env.AWS_REGION;
   // Notify CodePipeline of a successful job
    const putJobSuccess = async (message) => {
        const params = {
            jobId: jobId,
            outputVariables: {
                testRunId: Math.floor(Math.random() * 1000).toString(),
                dateTime: Date(Date.now()).toString(),
                region: lambdaRegion
            }
       };
        try {
            await codepipeline.putJobSuccessResult(params);
            return message;
        } catch (err) {
            throw err;
        }
```

```
};
    // Notify CodePipeline of a failed job
    const putJobFailure = async (message) => {
        const params = {
            jobId: jobId,
            failureDetails: {
                message: JSON.stringify(message),
                type: 'JobFailed',
                externalExecutionId: context.invokeid
            }
        };
        try {
            await codepipeline.putJobFailureResult(params);
            throw message;
        } catch (err) {
            throw err;
        }
    };
    try {
        console.log("Testing commit - " + params);
        // Your tests here
        // Succeed the job
        return await putJobSuccess("Tests passed.");
    } catch (ex) {
        // If any of the assertions failed then fail the job
        return await putJobFailure(ex);
    }
};
```

- 7. Allow the function to auto save.
- 8. Copy the Amazon Resource Name (ARN) contained in the **Function ARN** field at the top of the screen.
- As a last step, open the Amazon Identity and Access Management (IAM) console at https://console.amazonaws.cn/iam/. Modify the Lambda execution role to add the following policy: AWSCodePipelineCustomActionAccess. For the steps to create a Lambda execution role or modify the role policy, see Stepsilon.amazonaws.cn/iam/. Modify the Lambda execution role to add the following policy: AWSCodePipelineCustomAccess. For the steps to create a Lambda execution role or modify the role policy, see Stepsilon.amazonaws.cn/iam/.

Step 2: Add a Lambda invoke action and manual approval action to your pipeline

In this step, you add a Lambda invoke action to your pipeline. You add the action as part of a stage named **Test**. The action type is an invoke action. You then add a manual approval action after the invoke action.

To add a Lambda action and a manual approval action to the pipeline

1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

The names of all pipelines that are associated with your Amazon account are displayed. Choose the pipeline where you want to add the action.

- 2. Add the Lambda test action to your pipeline.
 - a. To edit your pipeline, choose **Edit**. Add a stage after the source action in the existing pipeline. Enter a name for the stage, such as **Test**.
 - b. In the new stage, choose **Add action group** to add an action. In **Action name**, enter the name of the invoke action, such as **Test_Commit**.
 - c. In **Action provider**, choose **Amazon Lambda**.
 - d. In **Input artifacts**, choose the name of your source action's output artifact, such as SourceArtifact.
 - e. In **FunctionName**, add the ARN of the Lambda function that you created.
 - f. In Variable namespace, add the namespace name, such as **TestVariables**.
 - g. In **Output artifacts**, add the output artifact name, such as **LambdaArtifact**.
 - h. Choose **Done**.
- 3. Add the manual approval action to your pipeline.
 - a. With your pipeline still in editing mode, add a stage after the invoke action. Enter a name for the stage, such as **Approval**.
 - b. In the new stage, choose the icon to add an action. In **Action name**, enter the name of the approval action, such as **Change_Approval**.
 - c. In **Action provider**, choose **Manual approval**.

d. In **URL for review**, construct the URL by adding the variable syntax for the region variable and the CommitId variable. Make sure that you use the namespaces assigned to the actions that provide the output variables.

For this example, the URL with the variable syntax for a CodeCommit action has the default namespace SourceVariables. The Lambda region output variable has the TestVariables namespace. The URL looks like the following.

https://#{TestVariables.region}.console.aws.amazon.com/codesuite/codecommit/ repositories/MyDemoRepo/commit/#{SourceVariables.CommitId}

In **Comments**, construct the approval message text by adding the variable syntax for the testRunId variable. For this example, the URL with the variable syntax for the Lambda testRunId output variable has the TestVariables namespace. Enter the following message.

Make sure to review the code before approving this action. Test Run ID: #{TestVariables.testRunId}

4. Choose **Done** to close the edit screen for the action, and then choose **Done** to close the edit screen for the stage. To save the pipeline, choose **Done**. The completed pipeline now contains a structure with source, test, approval, and deploy stages.

Choose **Release change** to run the latest change through the pipeline structure.

- 5. When the pipeline reaches the manual approval stage, choose **Review**. The resolved variables appear as the URL for the commit ID. Your approver can choose the URL to view the commit.
- 6. After the pipeline runs successfully, you can also view the variable values on the action execution history page.

Tutorial: Use an Amazon Step Functions invoke action in a pipeline

You can use Amazon Step Functions to create and configure state machines. This tutorial shows you how to add an invoke action to a pipeline that activates state machine executions from your pipeline.

Tutorial: Use an Amazon Step Functions invoke action

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

In this tutorial, you do the following tasks:

- Create a standard state machine in Amazon Step Functions.
- Enter the state machine input JSON directly. You can also upload the state machine input file to an Amazon Simple Storage Service (Amazon S3) bucket.
- Update your pipeline by adding the state machine action.

The CodePipeline action for Step Functions is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with</u> CodePipeline.

Topics

- Prerequisite: Create or choose a simple pipeline
- Step 1: Create the sample state machine
- Step 2: Add a Step Functions invoke action to your pipeline

Prerequisite: Create or choose a simple pipeline

In this tutorial, you add an invoke action to an existing pipeline. You can use the pipeline you created in <u>Tutorial: Create a simple pipeline (S3 bucket)</u> or <u>Tutorial: Create a simple pipeline</u> (CodeCommit repository).

You use an existing pipeline with a source action and at least a two-stage structure, but you do not use source artifacts for this example.

User Guide

í) Note

You might need to update the service role used by your pipeline with additional permissions required to run this action. To do this, open the Amazon Identity and Access Management (IAM) console, find the role, and then add the permissions to the role's policy. For more information, see <u>Add permissions to the CodePipeline service role</u>.

Step 1: Create the sample state machine

In the Step Functions console, create a state machine using the HelloWorld sample template. For instructions, see <u>Create a State Machine</u> in the *Amazon Step Functions Developer Guide*.

Step 2: Add a Step Functions invoke action to your pipeline

Add a Step Functions invoke action to your pipeline as follows:

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit. This opens a detailed view of the pipeline, including the state of each of the actions in each stage of the pipeline.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the second stage of your simple pipeline, choose **Edit stage**. Choose **Delete**. This deletes the second stage now that you no longer need it.
- 5. At the bottom of the diagram, choose + Add stage.
- 6. In **Stage name**, enter a name for the stage, such as **Invoke**, and then choose **Add stage**.
- 7. Choose + Add action group.
- 8. In Action name, enter a name, such as Invoke.
- 9. In **Action provider**, choose **Amazon Step Functions**. Allow **Region** to default to the pipeline Region.
- 10. In **Input artifacts**, choose SourceArtifact.
- 11. In **State machine ARN**, choose the Amazon Resource Name (ARN) for the state machine that you created earlier.

- 12. (Optional) In **Execution name prefix**, enter a prefix to be added to the state machine execution ID.
- 13. In Input type, choose Literal.
- 14. In Input, enter the input JSON that the HelloWorld sample state machine expects.

🚯 Note

The input to the state machine execution is different from the term used in CodePipeline to describe input artifacts for actions.

For this example, enter the following JSON:

{"IsHelloWorldExample": true}

- 15. Choose Done.
- 16. On the stage that you're editing, choose **Done**. In the Amazon CodePipeline pane, choose **Save**, and then choose **Save** on the warning message.
- 17. To submit your changes and start a pipeline execution, choose **Release change**, and then choose **Release**.
- 18. On your completed pipeline, choose **Amazon Step Functions** in your invoke action. In the Amazon Step Functions console, view your state machine execution ID. The ID shows your state machine name HelloWorld and the state machine execution ID with the prefix my-prefix.

```
arn:aws:states:us-west-2:account-ID:execution:HelloWorld:my-
prefix-0d9a0900-3609-4ebc-925e-83d9618fcca1
```

Tutorial: Create a pipeline that uses Amazon AppConfig as a deployment provider

In this tutorial, you configure a pipeline that continuously delivers configuration files using Amazon AppConfig as the deployment action provider in your deployment stage.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

Topics

- Prerequisites
- Step 1: Create your Amazon AppConfig resources
- Step 2: Upload files to your S3 source bucket
- Step 3: Create your pipeline
- Step 4: Make a change to any source file and verify deployment

Prerequisites

Before you begin, you must complete the following:

 This example uses an S3 source for your pipeline. Create or use an Amazon S3 bucket with versioning enabled. Follow the instructions in <u>Step 1: Create an S3 source bucket for your</u> <u>application</u> to create an S3 bucket.

Step 1: Create your Amazon AppConfig resources

In this section, you create the following resources:

- An *application* in Amazon AppConfig is a logical unit of code that provides capabilities for your customers.
- An *environment* in Amazon AppConfig is a logical deployment group of AppConfig targets, such as applications in a beta or production environment.
- A *configuration profile* is a collection of settings that influence the behavior of your application. The configuration profile enables Amazon AppConfig to access your configuration in its stored location.

 (Optional) A *deployment strategy* in Amazon AppConfig defines the behavior of a configuration deployment, such as what percentage of clients should receive the new deployed config at any given time during a deployment.

To create an application, environment, configuration profile, and deployment strategy

- 1. Sign in to the Amazon Web Services Management Console.
- 2. Use the steps in the following topics to create your resources in Amazon AppConfig.
 - Create an application.
 - Create an environment.
 - Create an Amazon CodePipeline configuration profile.
 - (Optional) Choose a predefined deployment strategy or create your own.

Step 2: Upload files to your S3 source bucket

In this section, create your configuration file or files. Then zip and push your source files to the bucket that the pipeline uses for your source stage.

To create configuration files

1. Create a configuration.json file for each configuration in each Region. Include the following contents:

Hello World!

2. Use the following steps to zip and upload your configuration files.

To zip and upload source files

1. Create a .zip file with your files and name the .zip file configuration-files.zip. As an example, your .zip file can use the following structure:

```
.
### appconfig-configurations
### MyConfigurations
### us-east-1
# ### configuration.json
```

```
### us-west-2
    ### configuration.json
```

2. In the Amazon S3 console for your bucket, choose **Upload**, and follow the instructions to upload your .zip file.

Step 3: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with an Amazon S3 action where the source artifacts are the files for your configuration.
- A deployment stage with an AppConfig deployment action.

To create a pipeline with the wizard

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, **Getting started** page, or the **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyAppConfigPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In Service role, choose New service role to allow CodePipeline to create a service role in IAM.
- 7. Leave the settings under **Advanced settings** at their defaults, and then choose **Next**.
- 8. In **Step 3: Add source stage**, in **Source provider**, choose **Amazon S3**. In **Bucket**, choose the name of your S3 source bucket.

In **S3 object key**, enter the name of your .zip file: configuration-files.zip.

Choose Next.

9. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. In Step 6: Add deploy stage:
 - a. In **Deploy provider**, choose **Amazon AppConfig**.
 - b. In **Application**, choose the name of the application you created in Amazon AppConfig. The field shows the ID for your application.
 - c. In **Environment**, choose the name of the environment you created in Amazon AppConfig. The field shows the ID for your environment.
 - d. In **Configuration profile**, choose the name of the configuration profile you created in Amazon AppConfig. The field shows the ID for your configuration profile.
 - e. In **Deployment strategy**, choose the name of your deployment strategy. This can be either a deployment strategy you created in AppConfig or one you have chosen from predefined deployment strategies in AppConfig. The field shows the ID for your deployment strategy.
 - f. In Input artifact configuration path, enter the file path. Make sure that your input artifact configuration path matches the directory structure in your S3 bucket .zip file. For this example, enter the following file path: appconfig-configurations/ MyConfigurations/us-west-2/configuration.json.
 - g. Choose **Next**.
- 12. In **Step 7: Review**, review the information, and then choose **Create pipeline**.

Step 4: Make a change to any source file and verify deployment

Make a change to your source files and upload the change to your bucket. This triggers your pipeline to run. Verify that your configuration is available by viewing the version.

Tutorial: Use full clone with a GitHub pipeline source

You can choose the full clone option for your GitHub source action in CodePipeline. Use this option to run CodeBuild commands for Git metadata in your pipeline build action.

🚯 Note

The full clone option described here refers to specifying whether CodePipeline should clone repository metadata, which can only be used by CodeBuild commands. To use a GitHub <u>user access token</u> for use with CodeBuild projects, follow the steps here to install the Amazon Connector for GitHub app and then leave the App installation field empty. CodeConnections will use the user access token for the connection.

🔥 Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

In this tutorial, you will create a pipeline that connects to your GitHub repository, uses the full clone option for source data, and run a CodeBuild build that clones your repository and performs Git commands for the repository.

🚺 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Topics

- <u>Prerequisites</u>
- Step 1: Create a README file
- <u>Step 2: Create your pipeline and build project</u>
- Step 3: Update the CodeBuild service role policy to use connections
- Step 4: View repository commands in build output

Prerequisites

Before you begin, you must do the following:

- Create a GitHub repository with your GitHub account.
- Have your GitHub credentials ready. When you use the Amazon Web Services Management Console to set up a connection, you are asked to sign in with your GitHub credentials.

Step 1: Create a README file

After you create your GitHub repository, use these steps to add a README file.

- 1. Log in to your GitHub repository and choose your repository.
- To create a new file, choose Add file > Create new file. Name the file README.md. file and add the following text.

This is a GitHub repository!

3. Choose **Commit changes**.

Make sure the README.md file is at the root level of your repository.

Step 2: Create your pipeline and build project

In this section, you create a pipeline with the following actions:

- A source stage with a connection to your GitHub repository and action.
- A build stage with an Amazon CodeBuild build action.

To create a pipeline with the wizard

- 1. Sign in to the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.
- 2. On the Welcome page, Getting started page, or Pipelines page, choose Create pipeline.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyGitHubPipeline.

User Guide

- 5. In **Pipeline type**, choose **V1** for the purposes of this tutorial. You can also choose **V2**; however, note that pipeline types differ in characteristics and price. For more information, see <u>Pipeline</u> types.
- 6. In Service role, choose New service role.

1 Note

If you choose instead to use your existing CodePipeline service role, make sure that you have added the codestar-connections:UseConnection IAM permission to your service role policy. For instructions for the CodePipeline service role, see <u>Add</u> permissions to the the CodePipeline service role.

7. Under **Advanced settings**, leave the defaults. In **Artifact store**, choose **Default location** to use the default artifact store, such as the Amazon S3 artifact bucket designated as the default, for your pipeline in the Region you selected for your pipeline.

Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline.

Choose Next.

- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In **Source provider**, choose **GitHub (via GitHub App)**.
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.

You install one app for all of your connections to a particular provider. If you have already installed the Amazon Connector for GitHub app, choose it and skip this step.

Note

If you want to create a <u>user access token</u>, make sure that you've already installed the Amazon Connector for GitHub app and then leave the App installation field

empty. CodeConnections will use the user access token for the connection. For more information, see <u>Access your source provider in CodeBuild</u>.

- c. In **Repository name**, choose the name of your GitHub repository.
- d. In **Branch name**, choose the repository branch you want to use.
- e. Make sure the **Start the pipeline on source code change** option is selected.
- f. Under Output artifact format, choose Full clone to enable the Git clone option for the source repository. Only actions provided by CodeBuild can use the Git clone option. You will use <u>Step 3: Update the CodeBuild service role policy to use connections</u> in this tutorial to update the permissions for your CodeBuild project service role to use this option.

Choose Next.

- 9. In Step 4: Add build stage, add a build stage:
 - a. In **Build provider**, choose **Amazon CodeBuild**. Allow **Region** to default to the pipeline Region.
 - b. Choose **Create project**.
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For **Runtime**, choose **Standard**. For **Image**, choose **aws/codebuild/standard:5.0**.
 - f. For Service role, choose New service role.

🚯 Note

Note the name of your CodeBuild service role. You will need the role name for the final step in this tutorial.

g. Under **Buildspec**, for **Build specifications**, choose **Insert build commands**. Choose **Switch to editor**, and paste the following under **Build commands**.

🚺 Note

In the env section of the build spec, make sure the credential helper for git commands is enabled as shown in this example.

```
version: 0.2
env:
  git-credential-helper: yes
phases:
 install:
    #If you use the Ubuntu standard image 2.0 or later, you must specify
 runtime-versions.
    #If you specify runtime-versions and use an image other than Ubuntu
 standard image 2.0, the build fails.
    runtime-versions:
      nodejs: 12
      # name: version
    #commands:
      # - command
      # - command
  pre_build:
    commands:
      - ls -lt
      - cat README.md
  build:
    commands:
      - git log | head -100
      - git status
      - ls
      - git archive --format=zip HEAD > application.zip
  #post_build:
    #commands:
      # - command
      # - command
artifacts:
 files:
    - application.zip
    # - location
  #name: $(date +%Y-%m-%d)
  #discard-paths: yes
  #base-directory: location
#cache:
  #paths:
    # - paths
```

- h. Choose **Continue to CodePipeline**. This returns to the CodePipeline console and creates a CodeBuild project that uses your build commands for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Choose **Next**.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 12. On Step 7: Review, choose Create pipeline.

Step 3: Update the CodeBuild service role policy to use connections

The initial pipeline run will fail because the CodeBuild service role must be updated with permissions to use connections. Add the codestar-connections:UseConnection IAM permission to your service role policy. For instructions to update the policy in the IAM console, see Add CodeBuild GitClone permissions for connections to Bitbucket, GitHub, GitHub Enterprise Server, or GitLab.com.

Step 4: View repository commands in build output

- 1. When your service role is successfully updated, choose **Retry** on the failed CodeBuild stage.
- 2. After the pipeline runs successfully, on your successful build stage, choose **View details**.

On the details page, choose the **Logs** tab. View the CodeBuild build output. The commands output the value of the entered variable.

The commands output the README.md file contents, list the files in the directory, clone the repository, view the log, and archive the repository as a ZIP file.

Tutorial: Use full clone with a CodeCommit pipeline source

You can choose the full clone option for your CodeCommit source action in CodePipeline. Use this option to allow CodeBuild to access Git metadata in your pipeline build action.

In this tutorial, you create a pipeline that accesses your CodeCommit repository, uses the full clone option for source data, and runs a CodeBuild build that clones your repository and performs Git commands for the repository.

🚯 Note

CodeBuild actions are the only downstream actions support use of Git metadata available with the Git clone option. Also, while your pipeline can contain cross-account actions, the CodeCommit action and the CodeBuild action must be in the same account for the full clone option to succeed.

🔥 Important

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

Topics

- Prerequisites
- Step 1: Create a README file
- Step 2: Create your pipeline and build project
- Step 3: Update the CodeBuild service role policy to clone the repository
- Step 4: View repository commands in build output

Prerequisites

Before you begin, you must create a CodeCommit repository in the same Amazon account and Region as your pipeline.

Step 1: Create a README file

Use these steps to add a README file to your source repository. The README file provides an example source file for the CodeBuild downstream action to read.

To add a README file

- 1. Log in to your repository and choose your repository.
- To create a new file, choose Add file > Create file. Name the file README.md. file and add the following text.

This is a CodeCommit repository!

3. Choose **Commit changes**.

Make sure the README.md file is at the root level of your repository.

Step 2: Create your pipeline and build project

In this section, you create a pipeline with the following actions:

- A source stage with a CodeCommit source action.
- A build stage with an Amazon CodeBuild build action.

To create a pipeline with the wizard

- 1. Sign in to the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the Welcome page, Getting started page, or Pipelines page, choose Create pipeline.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyCodeCommitPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> types. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In **Service role**, do one of the following:
 - Choose Existing service role.
 - Choose your existing CodePipeline service role. This role must have the codecommit:GetRepository IAM permission to your service role policy. See <u>Add</u> permissions to the the CodePipeline service role.
- 7. Under Advanced settings, leave the defaults. Choose Next.
- 8. On the **Step 3: Add source stage** page, do the following:

- a. In **Source provider**, choose **CodeCommit**.
- b. In **Repository name**, choose the name of your repository.
- c. In **Branch name**, choose your branch name.
- d. Make sure the **Start the pipeline on source code change** option is selected.
- e. Under **Output artifact format**, choose **Full clone** to enable the Git clone option for the source repository. Only actions provided by CodeBuild can use the Git clone option.

Choose Next.

- 9. In Step 4: Add build stage, do the following:
 - a. In **Build provider**, choose **Amazon CodeBuild**. Allow **Region** to default to the pipeline Region.
 - b. Choose Create project.
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For **Runtime**, choose **Standard**. For **Image**, choose **aws/codebuild/standard:5.0**.
 - f. For **Service role**, choose **New service role**.

🚯 Note

Note the name of your CodeBuild service role. You will need the role name for the final step in this tutorial.

g. Under **Buildspec**, for **Build specifications**, choose **Insert build commands**. Choose **Switch to editor**, and then under **Build commands** paste the following code.

```
version: 0.2
env:
  git-credential-helper: yes
phases:
  install:
    #If you use the Ubuntu standard image 2.0 or later, you must specify
runtime-versions.
    #If you specify runtime-versions and use an image other than Ubuntu
standard image 2.0, the build fails.
```

runtime-versions: nodejs: 12 # name: version #commands: # - command # - command pre_build: commands: - ls -lt - cat README.md build: commands: - git log | head -100 - git status - ls - git describe --all #post_build: #commands: # - command # - command #artifacts: #files: # - location #name: \$(date +%Y-%m-%d) #discard-paths: yes #base-directory: location #cache: #paths: # - paths

- h. Choose **Continue to CodePipeline**. This returns you to the CodePipeline console and creates a CodeBuild project that uses your build commands for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Choose Next.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

11. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.

12. On Step 7: Review, choose Create pipeline.

Step 3: Update the CodeBuild service role policy to clone the repository

The initial pipeline run will fail because you need to update the CodeBuild service role with permissions to pull from your repository.

Add the codecommit:GitPull IAM permission to your service role policy. For instructions to update the policy in the IAM console, see <u>Add CodeBuild GitClone permissions for CodeCommit</u> source actions.

Step 4: View repository commands in build output

To view the build output

- 1. When your service role is successfully updated, choose **Retry** on the failed CodeBuild stage.
- 2. After the pipeline runs successfully, on your successful build stage, choose **View details**.

On the details page, choose the **Logs** tab. View the CodeBuild build output. The commands output the value of the entered variable.

The commands output the README.md file contents, list the files in the directory, clone the repository, view the log, and run git describe --all.

Tutorial: Create a pipeline with Amazon CloudFormation StackSets deployment actions

In this tutorial, you use the Amazon CodePipeline console to create a pipeline with deployment actions for creating a stack set and creating stack instances. When the pipeline runs, the template creates a stack set and also creates and updates the instances where the stack set is deployed.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

There are two ways to manage permissions for a stack set: self-managed and Amazon-managed IAM roles. This tutorial provides examples with self-managed permissions.

To most effectively use Stacksets in CodePipeline, you should have a clear understanding of the concepts behind Amazon CloudFormation StackSets and how they work. See <u>StackSets concepts</u> in the *Amazon CloudFormation User Guide*.

These actions are not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with CodePipeline</u>.

Topics

- Prerequisites
- Step 1: Upload the sample Amazon CloudFormation template and parameter file
- Step 2: Create your pipeline
- Step 3: View initial deployment
- Step 4: Add a CloudFormationStackInstances action
- Step 5: View stack set resources for your deployment
- Step 6: Make an update to your stack set

Prerequisites

For stack set operations, you use two different accounts: an administration account and a target account. You create stack sets in the administrator account. You create individual stacks that belong to a stack set in the target account.

To create an administrator role with your administrator account

• Follow the instructions in <u>Set up basic permissions for stack set operations</u>. Your role must be named **AWSCloudFormationStackSetAdministrationRole**.

To create a service role in the target account

 Create a service role in the target account that trusts the administrator account. Follow the instructions in <u>Set up basic permissions for stack set operations</u>. Your role must be named AWSCloudFormationStackSetExecutionRole.

Step 1: Upload the sample Amazon CloudFormation template and parameter file

Create a source bucket for your stack set template and parameters files. Download the sample Amazon CloudFormation template file, set up a parameters file, and then zip the files before upload to your S3 source bucket.

🚯 Note

Make sure to ZIP the source files before you upload to your S3 source bucket, even if the only source file is the template.

To create an S3 source bucket

- Sign in to the Amazon Web Services Management Console and open the Amazon S3 console at <u>https://console.amazonaws.cn/s3/</u>.
- 2. Choose **Create bucket**.
- 3. In **Bucket name**, enter a name for your bucket.

In **Region**, choose the Region where you want to create your pipeline. Choose **Create bucket**.

- 4. After the bucket is created, a success banner displays. Choose **Go to bucket details**.
- 5. On the **Properties** tab, choose **Versioning**. Choose **Enable versioning**, and then choose **Save**.

To create the Amazon CloudFormation template file

- Download the following sample template file for generating CloudTrail configuration for stack sets: <u>https://s3.amazonaws.com/cloudformation-stackset-sample-templates-us-east-1/</u> EnableAWSCloudtrail.yml.
- 2. Save the file as template.yml.

To create the parameters.txt file

 Create a file with the parameters for your deployment. Parameters are values that you want to update in your stack at runtime. The following sample file updates the template parameters for your stack set to enable logging validation and global events.

2. Save the file as parameters.txt.

To create the accounts.txt file

1. Create a file with the accounts where you want to create instances, as shown in the following sample file.

```
[
"111111222222","333333444444"
]
```

2. Save the file as accounts.txt.

To create and upload source files

1. Combine the files into a single ZIP file. Your files should look like this in your ZIP file.

```
template.yml
parameters.txt
accounts.txt
```

2. Upload the ZIP file to your S3 bucket. This file is the source artifact created by the **Create Pipeline** wizard for your deployment action in CodePipeline. In this section, you create a pipeline with the following actions:

- A source stage with an S3 source action where the source artifact is your template file and any supporting source files.
- A deployment stage with an Amazon CloudFormation stack set deployment action that creates the stack set.
- A deployment stage with an Amazon CloudFormation stack instances deployment action that creates the stacks and instances within the target accounts.

To create a pipeline with a CloudFormationStackSet action

- Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.
- 2. On the **Welcome** page, **Getting started** page, or **Pipelines** page, choose **Create pipeline**.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyStackSetsPipeline.
- 5. In **Pipeline type**, choose **V1** for the purposes of this tutorial. You can also choose **V2**; however, note that pipeline types differ in characteristics and price. For more information, see <u>Pipeline</u> <u>types</u>.
- 6. In **Service role**, choose **New service role** to allow CodePipeline to create a service role in IAM.
- 7. In **Artifact store**, leave the defaults.

🚯 Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline. When you create or edit a pipeline, you must have an artifact bucket in the pipeline Region and one artifact bucket per Amazon Region where you are running an action. For more information, see Input and output artifacts and CodePipeline pipeline structure reference.

Choose Next.

- 8. On the **Step 3: Add source stage** page, in **Source provider**, choose **Amazon S3**.
- 9. In **Bucket**, enter the S3 source bucket you created for this tutorial, such as BucketName. In **S3 object key**, enter the file path and file name for your ZIP file, such as MyFiles.zip.
- 10. Choose Next.
- 11. In **Step 4: Add build stage**, choose **Skip build stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

12. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 13. In Step 6: Add deploy stage:
 - a. In **Deploy provider**, choose **Amazon CloudFormation Stack Set**.
 - b. In **Stack set name**, enter a name for the stack set. This is the name of the stack set that the template creates.

🚯 Note

Make a note of your stack set name. You will use it when you add the second StackSets deployment action to your pipeline.

c. In **Template path**, enter the artifact name and file path where you uploaded your template file. For example, enter the following using the default source artifact name SourceArtifact.

SourceArtifact::template.yml

d. In **Deployment targets**, enter the artifact name and file path where you uploaded your accounts file. For example, enter the following using the default source artifact name SourceArtifact.

SourceArtifact::accounts.txt

e. In **Deployment target Amazon Web Services Regions**, enter one Region for deployment of your initial stack instance, such as us-east-1.

f. Expand **Deployment options**. In **Parameters**, enter the artifact name and file path where you uploaded your parameters file. For example, enter the following using the default source artifact name SourceArtifact.

SourceArtifact::parameters.txt

To enter the parameters as a literal input rather than a file path, enter the following:

ParameterKey=EnableLogFileValidation,ParameterValue=true ParameterKey=IncludeGlobalEvents,ParameterValue=true

- g. In **Capabilities**, choose CAPABILITY_IAM and CAPABILITY_NAMED_IAM.
- h. In **Permission model**, choose SELF_MANAGED.
- i. In Failure tolerance percentage, enter 20.
- j. In Max concurrent percentage, enter 25.
- k. Choose Next.
- I. In **Step 7: Review**, choose **Create pipeline**. Your pipeline displays.
- m. Allow your pipeline to run.

Step 3: View initial deployment

View the resources and status for your initial deployment. After verifying the deployment successfully created your stack set, you can add the second action to your **Deploy** stage.

To view the resources

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. Under **Pipelines**, choose your pipeline and choose **View**. The diagram shows your pipeline source and deployment stages.
- Choose the Amazon CloudFormation action on the CloudFormationStackSet action in your pipeline. The template, resources, and events for your stack set are shown in the Amazon CloudFormation console.
- 4. In the left navigation panel, choose **StackSets**. In the list, choose the new stack set.
- 5. Choose the **Stack instances** tab. Verify that one stack instance for each account you provided was created in the us-east-1 Region. Verify that the status for each stack instance is CURRENT.

Step 4: Add a CloudFormationStackInstances action

Create a next action in your pipeline that will allow Amazon CloudFormation StackSets to create the remainingstack instances.

To create a next action in your pipeline

1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.

Under **Pipelines**, choose your pipeline and choose **View**. The diagram shows your pipeline source and deployment stages.

- 2. Choose to edit the pipeline. The pipeline displays in **Edit** mode.
- 3. On the **Deploy** stage, choose **Edit**.
- 4. Under the Amazon CloudFormation Stack Set deploy action, choose Add action group.
- 5. On the **Edit action** page, add the action details:
 - a. In **Action name**, enter a name for the action.
 - b. In Action provider, choose Amazon CloudFormation Stack Instances.
 - c. Under Input artifacts, choose SourceArtifact.
 - d. In **Stack set name**, enter the name for the stack set. This is the name of the stack set that you provided in the first action.
 - e. In **Deployment targets**, enter the artifact name and file path where you uploaded your accounts file. For example, enter the following using the default source artifact name SourceArtifact.

SourceArtifact::accounts.txt

f. In **Deployment target Amazon Web Services Regions**, enter the Regions for deployment of your remaining stack instances, such as us-east-2 and eu-central-1 as follows:

us-east2, eu-central-1

- g. In Failure tolerance percentage, enter 20.
- h. In Max concurrent percentage, enter 25.
- i. Choose **Save**.
- j. .Manually release a change. Your updated pipeline displays with two actions in the Deploy stage.

Step 5: View stack set resources for your deployment

You can view the resources and status for your stack set deployment.

To view the resources

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. Under **Pipelines**, choose your pipeline and then choose **View**. The diagram shows your pipeline source and deployment stages.
- Choose the Amazon CloudFormation action on the Amazon CloudFormation Stack Instances action in your pipeline. The template, resources, and events for your stack set are shown in the Amazon CloudFormation console.
- 4. In the left navigation panel, choose **StackSets**. In the list, choose your stack set.
- 5. Choose the **Stack instances** tab. Verify that all remaining stack instances for each account you provided were created or updated in the expected Regions. Verify that the status for each stack instance is CURRENT.

Step 6: Make an update to your stack set

Make an update to your stack set and deploy the update to instances. In this example, you also make a change to the deployment targets you want to designate for update. The instances that are not part of the update move to an outdated status.

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. Under **Pipelines**, choose your pipeline and then choose **Edit**. On the **Deploy** stage, choose **Edit**.
- 3. Choose to edit the **Amazon CloudFormation Stack Set** action in your pipeline. In **Description**, write over the existing description with a new description for the stack set.
- Choose to edit the Amazon CloudFormation Stack Instances action in your pipeline. In Deployment target Amazon Web Services Regions, delete the us-east-2 value that was entered when the action was created.
- 5. Save the changes. Choose **Release change** to run your pipeline.
- 6. Open your action in Amazon CloudFormation. Choose the **StackSet info** tab. In **StackSet description**, verify that the new description is shown.

7. Choose the **Stack instances** tab. Under **Status**, verify that the status for the stack instances in us-east-2 is OUTDATED.

Tutorial: Create a variable check rule for a pipeline as an entry condition

In this tutorial, you configure a pipeline that continuously delivers files using GitHub as the source action provider in your source stage. The completed pipeline detects changes when you make a change to the source files in your source repository. The pipeline runs and then checks the output variables against the source repository name and branch name provided in the condition for entry to the build stage.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

▲ Important

Many of the actions you add to your pipeline in this procedure involve Amazon resources that you need to create before you create the pipeline. Amazon resources for your source actions must always be created in the same Amazon Region where you create your pipeline. For example, if you create your pipeline in the US East (Ohio) Region, your CodeCommit repository must be in the US East (Ohio) Region.

You can add cross-region actions when you create your pipeline. Amazon resources for cross-region actions must be in the same Amazon Region where you plan to execute the action. For more information, see Add a cross-Region action in CodePipeline.

This example uses the example pipeline with a GitHub (Version2) source action and a CodeBuild build action where the entry condition for the build stage will check for variables.

Prerequisites

Before you begin, you must do the following:

- Create a GitHub repository with your GitHub account.
- Have your GitHub credentials ready. When you use the Amazon Web Services Management Console to set up a connection, you are asked to sign in with your GitHub credentials.
- A connection to your repository to set up GitHub (via GitHub App) as the source action for your pipeline. To create a connection to your GitHub repository, see GitHub connections.

Step 1: Create sample source file and add to your GitHub repository

In this section, you create and add your example source file to the repository that the pipeline uses for your source stage. For this example, you produce and add the following:

• A README.md file.

After you create your GitHub repository, use these steps to add your README file.

- 1. Log in to your GitHub repository and choose your repository.
- 2. To create a new file, choose **Add file**, and then choose **Create new file**. Name the file README.md and add the following text.

This is a GitHub repository!

3. Choose **Commit changes**. For the purposes of this tutorial, add a commit message that contains the capitalized word "Update" as in the following example:

Update to source files

🚯 Note

The rule check for strings is case-sensitive.

Make sure the README.md file is at the root level of your repository.

User Guide

Step 2: Create your pipeline

In this section, you create a pipeline with the following actions:

- A source stage with a connection to your GitHub repository and action.
- A CodeBuild build stage where the stage has an On Entry condition configured for the variable check rule.

To create a pipeline with the wizard

- 1. Sign in to the CodePipeline console at <u>https://console.amazonaws.cn/codepipeline/</u>.
- 2. On the Welcome page, Getting started page, or Pipelines page, choose Create pipeline.
- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. In Step 2: Choose pipeline settings, in Pipeline name, enter MyVarCheckPipeline.
- CodePipeline provides V1 and V2 type pipelines, which differ in characteristics and price. The V2 type is the only type you can choose in the console. For more information, see <u>pipeline</u> <u>types</u>. For information about pricing for CodePipeline, see <u>Pricing</u>.
- 6. In Service role, choose New service role.

1 Note

If you choose instead to use your existing CodePipeline service role, make sure that you have added the codeconnections:UseConnection IAM permission to your service role policy. For instructions for the CodePipeline service role, see <u>Add permissions to</u> <u>the the CodePipeline service role</u>.

7. Under **Advanced settings**, leave the defaults.

Choose Next.

- 8. On the **Step 3: Add source stage** page, add a source stage:
 - a. In Source provider, choose GitHub (via GitHub App).
 - b. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see GitHub connections.
 - c. In **Repository name**, choose the name of your GitHub repository.

- d. In **Branch name**, choose the repository branch you want to use.
- e. Make sure the **No trigger** option is selected.

Choose Next.

- 9. In Step 4: Add build stage, add a build stage:
 - a. In **Build provider**, choose **Amazon CodeBuild**. Allow **Region** to default to the pipeline Region.
 - b. Choose Create project.
 - c. In **Project name**, enter a name for this build project.
 - d. In **Environment image**, choose **Managed image**. For **Operating system**, choose **Ubuntu**.
 - e. For **Runtime**, choose **Standard**. For **Image**, choose **aws/codebuild/standard:5.0**.
 - f. For **Service role**, choose **New service role**.

🚯 Note

Note the name of your CodeBuild service role. You will need the role name for the final step in this tutorial.

g. Under **Buildspec**, for **Build specifications**, choose **Insert build commands**. Choose **Switch to editor**, and paste the following under **Build commands**.

```
version: 0.2
#env:
  #variables:
     # kev: "value"
     # key: "value"
 #parameter-store:
     # key: "value"
     # key: "value"
 #git-credential-helper: yes
phases:
 install:
    #If you use the Ubuntu standard image 2.0 or later, you must specify
 runtime-versions.
    #If you specify runtime-versions and use an image other than Ubuntu
 standard image 2.0, the build fails.
    runtime-versions:
```

```
nodejs: 12
    #commands:
      # - command
      # - command
 #pre_build:
    #commands:
      # - command
      # - command
  build:
    commands:
 #post_build:
    #commands:
      # - command
      # - command
artifacts:
 files:
     _ '*'
    # - location
 name: $(date +%Y-%m-%d)
 #discard-paths: yes
 #base-directory: location
#cache:
  #paths:
    # - paths
```

- h. Choose **Continue to CodePipeline**. This returns to the CodePipeline console and creates a CodeBuild project that uses your build commands for configuration. The build project uses a service role to manage Amazon Web Services service permissions. This step might take a couple of minutes.
- i. Choose Next.
- 10. In **Step 5: Add test stage**, choose **Skip test stage**, and then accept the warning message by choosing **Skip** again.

Choose Next.

- 11. On the **Step 6: Add deploy stage** page, choose **Skip deploy stage**, and then accept the warning message by choosing **Skip** again. Choose **Next**.
- 12. On Step 7: Review, choose Create pipeline.

Step 2: Edit the build stage to add the condition and rule

In this step, you edit the stage to add an On Entry condition for the variable check rule.

1. Choose your pipeline, and then choose **Edit**. Choose to add an entry rule on the build stage.

In Rule provider, choose VariableCheck.

Edit rule

2. In **Variable**, enter the variable or variables that you want to check. In **Value**, enter the string value to check against the resolved variable. In the following example screens, a rule is created for an "equals" check, and another rule is created for a "contains" check.

Earchate		
Rule name		
Choose a name for your rule		
varrule		
No more than 100 characters		
Rule provider		
AWS VariableCheck		•
Variable The variable with the resolved value that will be che	cked against the provided string value.	
#{SourceVariables.FullRepositoryName}		
Variables must use the following syntax: #{namespa	ce.variable_key}.	
Value The string value to check against the resolved variab	ole value.	
/MyGitHubRepo		
Operator Operator for the comparison.		
• Equals Checks whether the variable is equal to the string value.	 Not equals Checks whether the variable is not equal to the string value. 	 Contains Checks whether the variable contains the string value as a substring.
O Matches Checks whether the variable matches a given regex expression as the string value.		

Rule name Choose a name for your rule		
varcheckmsg		
No more than 100 characters		
Rule provider		
AWS VariableCheck		
The variable with the resolved valu #{SourceVariables.CommitM	e that will be checked against the prov lessage}	ided string value.
The string value to check against t	he resolved variable value.	
Update Operator		
Operator	 Not equals Checks whether the variable is not equal to the string value. 	• Contains Checks whether the variable contains the string value as a substring.

3. Choose Save.

Choose Done.

Step 3: Run the pipeline and view resolved variables

In this step, you view the resolved values and results of the variable check rule.

1. View the resolved run after the rule check is successful as shown in the following example.

Source Succeeded
Pipeline execution ID: <u>1438349d-9809-4249-9621-</u>
Source
Source <u>GitHub (Version 2)</u>
Succeeded - 21 minutes ago
77cc2e44 🖸
View details
77cc2e44 🗹 Source: Merge pull request #5 from
Disable transition
\mathbf{V}
Entry condition: O Succeeded Execution ID: 1438349d
O Build Succeeded
Pipeline execution ID: <u>1438349d-9809-4249-9621</u>
Build
AWS CodeBuild
Succeeded - <u>18 minutes ago</u>
View details

2. View the variable information on the **Timeline** tab.

Visua	alization	Timeline	Variables Re	visions				
Actions							View execution details	
	Action name	Stage name	Status	Action provider	Started	Comple	eted	Duration
0	Source	Source	⊘ Succeed	ed GitHub (Version 2) 🖸	4 minutes ago	4 minut ago	tes	4 seconds
0	Build	Build	⊘ Succeed	ed <u>AWS CodeBuild</u>	4 minutes ago	Just no	w	3 minutes 31 seconds

Rules					
Name	Stage Condition	Status	Started	Duration	Reason
varcheckmsg AWS VariableCheck	Build Entry	⊘ Succeeded	4 minutes ago	less than one second	-
varrule AWS VariableCheck	Build Entry	⊘ Succeeded	4 minutes ago	less than one second	-

CodePipeline use cases

The following sections describe use cases for CodePipeline.

Topics

• Use cases for CodePipeline

Use cases for CodePipeline

You can create pipelines that integrate with other Amazon Web Services services. These can be Amazon Web Services services, such as Amazon S3, or third-party products, such as GitHub. This section provides examples for using CodePipeline to automate your code releases using different product integrations. For a full list of integrations with CodePipeline organized by action type, see CodePipeline pipeline structure reference.

Topics

- Use CodePipeline with Amazon S3, Amazon CodeCommit, and Amazon CodeDeploy
- Use CodePipeline with third-party action providers (GitHub and Jenkins)
- Use CodePipeline to compile, build, and test code with CodeBuild
- Use CodePipeline with Amazon ECS for continuous delivery of container-based applications to the cloud
- Use CodePipeline with Elastic Beanstalk for continuous delivery of web applications to the cloud
- Use CodePipeline with Amazon Lambda for continuous delivery of Lambda-based and serverless
 applications
- Use CodePipeline with Amazon CloudFormation templates for continuous delivery to the cloud

Use CodePipeline with Amazon S3, Amazon CodeCommit, and Amazon CodeDeploy

When you create a pipeline, CodePipeline integrates with Amazon products and services that act as action providers in each stage of your pipeline. When you choose stages in the wizard, you must choose a source stage and at least a build or deploy stage. The wizard creates the stages for you with default names that cannot be changed. These are the stage names created when you set up a full three-stage pipeline in the wizard:

- A source action stage with a default name of "Source."
- A build action stage with a default name of "Build."
- A deploy action stage with a default name of "Staging."

You can use the tutorials in this guide to create pipelines and specify stages:

- The steps in <u>Tutorial: Create a simple pipeline (S3 bucket)</u> help you use the wizard to create a
 pipeline with two default stages: "Source" and "Staging", where your Amazon S3 repository is
 the source provider. This tutorial creates a pipeline that uses Amazon CodeDeploy to deploy a
 sample application from an Amazon S3 bucket to Amazon EC2 instances running Amazon Linux.
- The steps in <u>Tutorial: Create a simple pipeline (CodeCommit repository)</u> help you use the wizard to create a pipeline with a "Source" stage that uses your Amazon CodeCommit repository as the source provider. This tutorial creates a pipeline that uses Amazon CodeDeploy to deploy a sample application from an Amazon CodeCommit repository to an Amazon EC2 instance running Amazon Linux.

Use CodePipeline with third-party action providers (GitHub and Jenkins)

You can create pipelines that integrate with third-party products such as GitHub and Jenkins. The steps in <u>Tutorial</u>: <u>Create a four-stage pipeline</u> show you how to create a pipeline that:

- Gets source code from a GitHub repository,
- Uses Jenkins to build and test the source code,
- Uses Amazon CodeDeploy to deploy the built and tested source code to Amazon EC2 instances running Amazon Linux or Microsoft Windows Server.

Use CodePipeline to compile, build, and test code with CodeBuild

CodeBuild is a managed build service in the cloud that lets you build and test your code without a server or system. Use CodePipeline with CodeBuild to automate running revisions through the pipeline for continuous delivery of software builds whenever there is a change to the source code. For more information, see <u>Use CodePipeline with CodeBuild to test code and run builds</u>.

Use CodePipeline with Amazon ECS for continuous delivery of container-based applications to the cloud

Amazon ECS is a container management service that lets you deploy container-based applications to Amazon ECS instances in the cloud. Use CodePipeline with Amazon ECS to automate running revisions through the pipeline for continuous deployment of container-based applications whenever there is a change to the source image repository. For more information, see <u>Tutorial</u>: <u>Continuous Deployment with CodePipeline</u>.

Use CodePipeline with Elastic Beanstalk for continuous delivery of web applications to the cloud

Elastic Beanstalk is a compute service that lets you deploy web applications and services to web servers. Use CodePipeline with Elastic Beanstalk for continuous deployment of web applications to your application environment. You can also use AWS CodeStar to create a pipeline with an Elastic Beanstalk deploy action.

Use CodePipeline with Amazon Lambda for continuous delivery of Lambda-based and serverless applications

You can use Amazon Lambda with CodePipeline for invoking an Amazon Lambda function, as described in <u>Deploying Serverless Applications</u>. You can also use Amazon Lambda and AWS CodeStar to create a pipeline for deploying serverless applications.

Use CodePipeline with Amazon CloudFormation templates for continuous delivery to the cloud

You can use Amazon CloudFormation with CodePipeline for continuous delivery and automation. For more information, see <u>Continuous Delivery with CodePipeline</u>. Amazon CloudFormation is also used to create the templates for pipelines created in AWS CodeStar.

Use CodePipeline with Amazon Virtual Private Cloud

Amazon CodePipeline now supports <u>Amazon Virtual Private Cloud (Amazon VPC)</u> endpoints powered by <u>Amazon PrivateLink</u>. This means you can connect directly to CodePipeline through a private endpoint in your VPC, keeping all traffic inside your VPC and the Amazon network.

Amazon VPC is an Amazon Web Services service that you can use to launch Amazon resources in a virtual network that you define. With a VPC, you have control over your network settings, such as:

- IP address range
- Subnets
- Route tables
- Network gateways

Interface VPC endpoints are powered by Amazon PrivateLink, an Amazon technology that facilitates private communication between Amazon Web Services services using an elastic network interface with private IP addresses. To connect your VPC to CodePipeline, you define an interface VPC endpoint for CodePipeline. This type of endpoint makes it possible for you to connect your VPC to Amazon Web Services services. The endpoint provides reliable, scalable connectivity to CodePipeline without requiring an internet gateway, network address translation (NAT) instance, or VPN connection. For information about setting up a VPC, see the VPC User Guide.

Availability

CodePipeline currently supports VPC endpoints in the following Amazon Web Services Regions:

- US East (Ohio)
- US East (N. Virginia)
- US West (N. California)
- US West (Oregon)
- Canada (Central)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- Europe (Milan)*

- Europe (Paris)
- Europe (Stockholm)
- Asia Pacific (Hong Kong)*
- Asia Pacific (Mumbai)
- Asia Pacific (Tokyo)
- Asia Pacific (Seoul)
- Asia Pacific (Singapore)
- Asia Pacific (Sydney)
- South America (São Paulo)
- Amazon GovCloud (US-West)

* You must enable this Region before you can use it.

Create a VPC endpoint for CodePipeline

You can use the Amazon VPC console to create the **com.amazonaws.***region.***codepipeline** VPC endpoint. In the console, *region* is the Region identifier for an Amazon Web Services Region supported by CodePipeline, such as us-west-2 for the US East (Ohio) Region. For more information, see <u>Creating an Interface Endpoint</u> in the *Amazon VPC User Guide*.

The endpoint is prepopulated with the Region you specified when you signed in to Amazon. If you sign in to another Region, the VPC endpoint is updated with the new Region.

Note

Other Amazon Web Services services that provide VPC support and integrate with CodePipeline, such as CodeCommit, might not support using Amazon VPC endpoints for that integration. For example, traffic between CodePipeline and CodeCommit cannot be restricted to the VPC subnet range.

Troubleshooting your VPC setup

When troubleshooting VPC issues, use the information that appears in internet connectivity error messages to help you identify, diagnose, and address issues.

- 1. Make sure that your internet gateway is attached to your VPC.
- 2. Make sure that the route table for your public subnet points to the internet gateway.
- 3. <u>Make sure that your network ACLs allow traffic to flow.</u>
- 4. Make sure that your security groups allow traffic to flow.
- 5. Make sure that the route table for private subnets points to the virtual private gateway.
- 6. Make sure that the service role used by CodePipeline has the appropriate permissions. For example, if CodePipeline does not have the Amazon EC2 permissions required to work with an Amazon VPC, you might receive an error that says, "Unexpected EC2 error: UnauthorizedOperation."

Define CI/CD pipelines with stages and actions

To define an automated release process in Amazon CodePipeline, you create a pipeline, which is a workflow construct that describes how software changes go through a release process. A pipeline is composed of stages and actions that you configure.

🚯 Note

When you add Build, Deploy, Test, or Invoke stages, in addition to the default options provided with CodePipeline, you can choose custom actions that you have already created for use with your pipelines. Custom actions can be used for tasks such as running an internally developed build process or a test suite. Version identifiers are included to help you distinguish among different versions of a custom action in the provider lists. For more information, see Create and add a custom action in CodePipeline.

Before you can create a pipeline, you must first complete the steps in <u>Getting started with</u> <u>CodePipeline</u>.

For more information about pipelines, see <u>CodePipeline concepts</u>, <u>CodePipeline tutorials</u>, and, if you want to use the Amazon CLI to create a pipeline, <u>Create a pipeline</u>, <u>stages</u>, <u>and actions</u>. To view a list of pipelines, see <u>View pipelines and details in CodePipeline</u>.

Topics

- Create a pipeline, stages, and actions
- Edit a pipeline in CodePipeline
- View pipelines and details in CodePipeline
- Delete a pipeline in CodePipeline
- Create a pipeline in CodePipeline that uses resources from another Amazon account
- Migrate polling pipelines to use event-based change detection
- Create the CodePipeline service role
- Tagging resources
- <u>Tag a pipeline in CodePipeline</u>
- Create a notification rule

Create a pipeline, stages, and actions

You can use the Amazon CodePipeline console or the Amazon CLI to create a pipeline. Pipelines must have at least two stages. The first stage of a pipeline must be a source stage. The pipeline must have at least one other stage that is a build or deployment stage.

<u> Important</u>

As part of creating a pipeline, an S3 artifact bucket provided by the customer will be used by CodePipeline for artifacts. (This is different from the bucket used for an S3 source action.) If the S3 artifact bucket is in a different account from the account for your pipeline, make sure that the S3 artifact bucket is owned by Amazon Web Services accounts that are safe and will be dependable.

You can add actions to your pipeline that are in an Amazon Web Services Region different from your pipeline. A cross-Region action is one in which an Amazon Web Services service is the provider for an action and the action type or provider type are in an Amazon Region different from your pipeline. For more information, see <u>Add a cross-Region action in CodePipeline</u>.

You can also create pipelines that build and deploy container-based applications by using Amazon ECS as the deployment provider. Before you create a pipeline that deploys container-based applications with Amazon ECS, you must create an image definitions file as described in <u>Image</u> <u>definitions file reference</u>.

CodePipeline uses change detection methods to start your pipeline when a source code change is pushed. These detection methods are based on source type:

• CodePipeline uses Amazon CloudWatch Events to detect changes in your CodeCommit source repository and branch or your S3 source bucket.

🚯 Note

When you use the console to create or edit a pipeline, the change detection resources are created for you. If you use the Amazon CLI to create the pipeline, you must create the additional resources yourself. For more information, see <u>CodeCommit source actions and EventBridge</u>.

Topics

- Create a custom pipeline (console)
- Create a pipeline (CLI)
- Create a pipeline from static templates

Create a custom pipeline (console)

To create a custom pipeline in the console, you must provide the source file location and information about the providers you will use for your actions.

When you use the console to create a pipeline, you must include a source stage and one or both of the following:

- A build stage.
- A deployment stage.

When you use the pipeline wizard, CodePipeline creates the names of stages (source, build, staging). These names cannot be changed. You can use more specific names (for example, BuildToGamma or DeployToProd) to stages you add later.

Step 1: Create and name your pipeline

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, choose **Create pipeline**.

If this is your first time using CodePipeline, choose **Get Started**.

- 3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Build custom pipeline** option. Choose **Next**.
- 4. On the **Step 2: Choose pipeline settings** page, in **Pipeline name**, enter the name for your pipeline.

In a single Amazon account, each pipeline you create in an Amazon Region must have a unique name. Names can be reused for pipelines in different Regions.

🚯 Note

After you create a pipeline, you cannot change its name. For information about other limitations, see <u>Quotas in Amazon CodePipeline</u>.

- 5. In **Pipeline type**, choose one of the following options. Pipeline types differ in characteristics and price. For more information, see <u>Pipeline types</u>.
 - V1 type pipelines have a JSON structure that contains standard pipeline, stage, and actionlevel parameters.
 - V2 type pipelines have the same structure as a V1 type, along with additional parameter support, such as triggers on Git tags and pipeline-level variables.
- 6. In **Service role**, do one of the following:
 - Choose **New service role** to allow CodePipeline to create a new service role in IAM.
 - Choose **Existing service role** to use a service role already created in IAM. In **Role ARN**, choose your service role ARN from the list.

🚯 Note

Depending on when your service role was created, you might need to update its permissions to support additional Amazon Web Services services. For information, see Add permissions to the CodePipeline service role.

For more information about the service role and its policy statement, see <u>Manage the</u> <u>CodePipeline service role</u>.

7. (Optional) Under Variables, choose Add variable to add variables at the pipeline level.

For more information about variables at the pipeline level, see <u>Variables reference</u>. For a tutorial with a pipeline-level variable that is passed at the time of the pipeline execution, see <u>Tutorial</u>: <u>Use pipeline-level variables</u>.

🚯 Note

While it is optional to add variables at the pipeline level, for a pipeline specified with variables at the pipeline level where no values are provided, the pipeline execution will fail.

- 8. (Optional) Expand Advanced settings.
- 9. In **Artifact store**, do one of the following:
 - a. Choose **Default location** to use the default artifact store, such as the S3 artifact bucket designated as the default, for your pipeline in the Amazon Web Services Region you have selected for your pipeline.
 - b. Choose **Custom location** if you already have an artifact store, such as an S3 artifact bucket, in the same Region as your pipeline. In **Bucket**, choose the bucket name.

i Note

This is not the source bucket for your source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline. When you create or edit a pipeline, you must have an artifact bucket in the pipeline Region and one artifact bucket per Amazon Region where you are running an action. For more information, see Input and output artifacts and CodePipeline pipeline structure reference.

10. In Encryption key, do one of the following:

- a. To use the CodePipeline default Amazon KMS key to encrypt the data in the pipeline artifact store (S3 bucket), choose **Default Amazon Managed Key**.
- b. To use your customer managed key to encrypt the data in the pipeline artifact store (S3 bucket), choose **Customer Managed Key**. Choose the key ID, key ARN, or alias ARN.

11. Choose Next.

- 1. On the **Step 3: Add source stage** page, in **Source provider**, choose the type of repository where your source code is stored, specify its required options. The additional fields display depending on the source provider selected as follows.
 - For Bitbucket Cloud, GitHub (via GitHub App), GitHub Enterprise Server, GitLab.com, or GitLab self-managed:
 - 1. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
 - 2. Choose the repository you want to use as the source location for your pipeline.

Choose to add a trigger or filter on trigger types to start your pipeline. For more information about working with triggers, see <u>Add trigger with code push or pull request</u> <u>event types</u>. For more information about filtering with glob patterns, see <u>Working with</u> glob patterns in syntax.

- 3. In **Output artifact format**, choose the format for your artifacts.
 - To store output artifacts from the GitHub action using the default method, choose CodePipeline default. The action accesses the files from the GitHub repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose **Full clone**. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Troubleshooting CodePipeline</u>. For a tutorial that shows you how to use the **Full clone** option, see <u>Tutorial: Use full clone with a GitHub pipeline</u> <u>source</u>.

- For Amazon S3:
 - 1. In **Amazon S3 location**, provide the S3 bucket name and path to the object in a bucket with versioning enabled. The format of the bucket name and path looks like this:

s3://bucketName/folderName/objectName

🚯 Note

When Amazon S3 is the source provider for your pipeline, you may zip your source file or files into a single .zip and upload the .zip to your source bucket. You may also upload a single unzipped file; however, downstream actions that expect a .zip file will fail.

- 2. After you choose the S3 source bucket, CodePipeline creates the Amazon CloudWatch Events rule and the Amazon CloudTrail trail to be created for this pipeline. Accept the defaults under **Change detection options**. This allows CodePipeline to use Amazon CloudWatch Events and Amazon CloudTrail to detect changes for your new pipeline. Choose **Next**.
- For Amazon CodeCommit:
 - In **Repository name**, choose the name of the CodeCommit repository you want to use as the source location for your pipeline. In **Branch name**, from the drop-down list, choose the branch you want to use.
 - In **Output artifact format**, choose the format for your artifacts.
 - To store output artifacts from the CodeCommit action using the default method, choose CodePipeline default. The action accesses the files from the CodeCommit repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose **Full clone**. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to add the codecommit:GitPull permission to your CodeBuild service role as shown in <u>Add CodeBuild GitClone</u> <u>permissions for CodeCommit source actions</u>. You will also need to add the codecommit:GetRepository permissions to your CodePipeline service role as shown in <u>Add permissions to the CodePipeline service role</u>. For a tutorial that shows you how to use the **Full clone** option, see <u>Tutorial</u>: Use full clone with a GitHub pipeline source.

- After you choose the CodeCommit repository name and branch, a message is displayed in **Change detection options** showing the Amazon CloudWatch Events rule to be created for this pipeline. Accept the defaults under **Change detection options**. This allows CodePipeline to use Amazon CloudWatch Events to detect changes for your new pipeline.
- For Amazon ECR:

- In **Repository name**, choose the name of your Amazon ECR repository.
- In Image tag, specify the image name and version, if different from LATEST.
- In **Output artifacts**, choose the output artifact default, such as MyApp, that contains the image name and repository URI information you want the next stage to use.

For a tutorial about creating a pipeline for Amazon ECS with CodeDeploy blue-green deployments that includes an Amazon ECR source stage, see <u>Tutorial: Create a pipeline</u> with an Amazon ECR source and ECS-to-CodeDeploy deployment.

When you include an Amazon ECR source stage in your pipeline, the source action generates an imageDetail.json file as an output artifact when you commit a change. For information about the imageDetail.json file, see <u>imageDetail.json file for Amazon ECS</u> <u>blue/green deployment actions</u>.

🚺 Note

The object and file type must be compatible with the deployment system you plan to use (for example, Elastic Beanstalk or CodeDeploy). Supported file types might include .zip, .tar, and .tgz files. For more information about the supported container types for Elastic Beanstalk, see <u>Customizing and Configuring Elastic Beanstalk</u> <u>Environments</u> and <u>Supported Platforms</u>. For more information about deploying revisions with CodeDeploy, see <u>Uploading Your Application Revision</u> and <u>Prepare a</u> <u>Revision</u>.

- To configure the stage for automatic retry, choose Enable automatic retry on stage failure.
 For more information about automatic retry, see <u>Configure a stage for automatic retry on failure</u>.
- 3. Choose Next.

Step 4: Create a build stage

This step is optional if you plan to create a deployment stage.

- 1. On the **Step 4: Add build stage** page, do one of the following, and then choose **Next**:
 - Choose **Skip build stage** if you plan to create a test or deployment stage.
 - To choose the Commands action for your build stage, choose Commands.

🚯 Note

Running the Commands action will incur separate charges in Amazon CodeBuild. If you plan to insert build commands as part of a CodeBuild action, go ahead and choose Other build providers, and then select CodeBuild.

In **Commands**, enter the shell commands for your action. For more information about the Commands action, see <u>Commands action reference</u>.

- To choose other build providers such as CodeBuild, choose Other providers. From Build provider, choose a custom action provider of build services, and provide the configuration details for that provider. For an example of how to add Jenkins as a build provider, see <u>Tutorial: Create a four-stage pipeline</u>.
- From **Build provider**, choose **Amazon CodeBuild**.

In **Region**, choose the Amazon Region where the resource exists. The **Region** field designates where the Amazon resources are created for this action type and provider type. This field is displayed only for actions where the action provider is an Amazon Web Services service. The **Region** field defaults to the same Amazon Region as your pipeline.

In **Project name**, choose your build project. If you have already created a build project in CodeBuild, choose it. Or you can create a build project in CodeBuild and then return to this task. Follow the instructions in <u>Create a Pipeline That Uses CodeBuild</u> in the *CodeBuild User Guide*.

Under **Build specifications**, the CodeBuild buildspec file is optional, and you can enter commands instead. In **Insert build commands**, enter the shell commands for your action. For more information about considerations for using build commands, see <u>Commands action</u> reference. Choose **Use a buildspec file** if you want to run commands in other phases or if you have a long list of commands.

In **Environment variables**, to add CodeBuild environment variables to your build action, choose **Add environment variable**. Each variable is made up of three entries:

• In Name, enter the name or key of the environment variable.

• In **Value**, enter the value of the environment variable. If you choose **Parameter** for the variable type, make sure this value is the name of a parameter you have already stored in Amazon Systems Manager Parameter Store.

🚺 Note

We strongly discourage the use of environment variables to store sensitive values, especially Amazon credentials. When you use the CodeBuild console or Amazon CLI, environment variables are displayed in plain text. For sensitive values, we recommend that you use the **Parameter** type instead.

 (Optional) In Type, enter the type of environment variable. Valid values are Plaintext or Parameter. The default is Plaintext.

(Optional) In **Build type**, choose one of the following:

- To run each build in a single build action execution, choose **Single build**.
- To run multiple builds in the same build action execution, choose **Batch build**.

(Optional) If you chose to run batch builds, you can choose **Combine all artifacts from batch into a single location** to place all build artifacts into a single output artifact.

- To configure the stage for automatic retry, choose Enable automatic retry on stage failure.
 For more information about automatic retry, see <u>Configure a stage for automatic retry on failure</u>.
- 3. Choose Next.

Step 5: Create a test stage

This step is optional if you plan to create a build or deployment stage.

- 1. On the **Step 5: Add test stage** page, do one of the following, and then choose **Next**:
 - Choose **Skip test stage** if you plan to create a build or deployment stage.
 - In **Test provider**, choose the test action provider and complete the appropriate fields.
- 2. Choose **Next**.

Step 6: Create a deployment stage

This step is optional if you have already created a build stage.

- 1. On the **Step 6: Add deploy stage** page, do one of the following, and then choose **Next**:
 - Choose **Skip deploy stage** if you created a build or test stage in the previous steps.

i Note

This option does not appear if you have already skipped the build or test stage.

• In **Deploy provider**, choose a custom action that you have created for a deployment provider.

In **Region**, for cross-Region actions only, choose the Amazon Region where the resource is created. The **Region** field designates where the Amazon resources are created for this action type and provider type. This field only displays for actions where the action provider is an Amazon Web Services service. The **Region** field defaults to the same Amazon Region as your pipeline.

- In **Deploy provider**, fields are available for default providers as follows:
 - CodeDeploy

In **Application name**, enter or choose the name of an existing CodeDeploy application. In **Deployment group**, enter the name of a deployment group for the application. Choose **Next**. You can also create an application, deployment group, or both in the CodeDeploy console.

• Amazon Elastic Beanstalk

In **Application name**, enter or choose the name of an existing Elastic Beanstalk application. In **Environment name**, enter an environment for the application. Choose **Next**. You can also create an application, environment, or both in the Elastic Beanstalk console.

Amazon OpsWorks Stacks

In **Stack**, enter or choose the name of the stack you want to use. In **Layer**, choose the layer that your target instances belong to. In **App**, choose the application that you want to update and deploy. If you need to create an app, choose **Create a new one in Amazon OpsWorks**.

For information about adding an application to a stack and layer in Amazon OpsWorks, see Adding Apps in the Amazon OpsWorks User Guide.

For an end-to-end example of how to use a simple pipeline in CodePipeline as the source for code that you run on Amazon OpsWorks layers, see <u>Using CodePipeline with Amazon</u> OpsWorks Stacks.

Amazon CloudFormation

Do one of the following:

- In **Action mode**, choose **Create or update a stack**, enter a stack name and template file name, and then choose the name of a role for Amazon CloudFormation to assume. Optionally, enter the name of a configuration file and choose an IAM capability option.
- In Action mode, choose Create or replace a change set, enter a stack name and change set name, and then choose the name of a role for Amazon CloudFormation to assume. Optionally, enter the name of a configuration file and choose an IAM capability option.

For information about integrating Amazon CloudFormation capabilities into a pipeline in CodePipeline, see <u>Continuous Delivery with CodePipeline</u> in the *Amazon CloudFormation User Guide*.

Amazon ECS

In **Cluster name**, enter or choose the name of an existing Amazon ECS cluster. In **Service name**, enter or choose the name of the service running on the cluster. You can also create a cluster and service. In **Image filename**, enter the name of the image definitions file that describes your service's container and image.

1 Note

The Amazon ECS deployment action requires an imagedefinitions.json file as an input to the deployment action. The default file name for the file is imagedefinitions.json. If you choose to use a different file name, you must provide it when you create the pipeline deployment stage. For more information, see imagedefinitions.json file for Amazon ECS standard deployment actions.

Choose Next.

🚯 Note

Make sure your Amazon ECS cluster is configured with two or more instances. Amazon ECS clusters must contain at least two instances so that one is maintained as the primary instance and another is used to accommodate new deployments.

For a tutorial about deploying container-based applications with your pipeline, see Tutorial: Continuous Deployment with CodePipeline.

Amazon ECS (Blue/Green)

Enter the CodeDeploy application and deployment group, Amazon ECS task definition, and AppSpec file information, and then choose **Next**.

🚺 Note

The **Amazon ECS (Blue/Green)** action requires an imageDetail.json file as an input artifact to the deploy action. Because the Amazon ECR source action creates this file, pipelines with an Amazon ECR source action do not need to provide an imageDetail.json file. For more information, see <u>imageDetail.json file for</u> Amazon ECS blue/green deployment actions.

For a tutorial about creating a pipeline for blue-green deployments to an Amazon ECS cluster with CodeDeploy, see <u>Tutorial: Create a pipeline with an Amazon ECR source and</u> ECS-to-CodeDeploy deployment.

Amazon Service Catalog

Choose **Enter deployment configuration** if you want to use fields in the console to specify your configuration, or choose **Configuration file** if you have a separate configuration file. Enter product and configuration information, and then choose **Next**.

For a tutorial about deploying product changes to Service Catalog with your pipeline, see Tutorial: Create a pipeline that deploys to Service Catalog.

• Alexa Skills Kit

In **Alexa Skill ID**, enter the skill ID for your Alexa skill. In **Client ID** and **Client secret**, enter the credentials generated using a Login with Amazon (LWA) security profile. In **Refresh token**, enter the refresh token you generated using the ASK CLI command for retrieving a refresh token. Choose **Next**.

For a tutorial about deploying Alexa skills with your pipeline and generating the LWA credentials, see Tutorial: Create a pipeline that deploys an Amazon Alexa skill.

• Amazon S3

In **Bucket**, enter the name of the S3 bucket you want to use. Choose **Extract file before deploy** if the input artifact to your deploy stage is a ZIP file. If **Extract file before deploy** is selected, you may optionally enter a value for **Deployment path** to which your ZIP file will be unzipped. If it is not selected, you are required to to enter a value in **S3 object key**.

🚺 Note

Most source and build stage output artifacts are zipped. All pipeline source providers except Amazon S3 zip your source files before providing them as the input artifact to the next action.

(Optional) In **Canned ACL**, enter the <u>canned ACL</u> to apply to the object deployed to Amazon S3.

🚯 Note

Applying a canned ACL overwrites any existing ACL applied to the object.

(Optional) In **Cache control**, specify the cache control parameters for requests to download objects from the bucket. For a list of valid values, see the <u>Cache-Control</u> header field for HTTP operations. To enter multiple values in **Cache control**, use a comma between each value. You can add a space after each comma (optional), as shown in this example.

Cache control - optional				
Set cache control for objects requested from your Amazon S3 bucket.				
public, max-age=0, no-transform				

The preceding example entry is displayed in the CLI as follows:

"CacheControl": "public, max-age=0, no-transform"

Choose Next.

For a tutorial about creating a pipeline with an Amazon S3 deployment action provider, see Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider.

- To configure the stage for automatic retry, choose Enable automatic retry on stage failure.
 For more information about automatic retry, see <u>Configure a stage for automatic retry on failure</u>.
- To configure the stage for automatic rollback, choose Configure automatic rollback on stage failure. For more information about automatic rollback, see <u>Configure a stage for automatic</u> rollback.
- 4. Choose Next step.

Step 7: Review the pipeline

• On the **Step 7: Review** page, review your pipeline configuration, and then choose **Create pipeline** to create the pipeline or **Previous** to go back and edit your choices. To exit the wizard without creating a pipeline, choose **Cancel**.

Now that you've created your pipeline, you can view it in the console. The pipeline starts to run after you create it. For more information, see <u>View pipelines and details in CodePipeline</u>. For more information about making changes to your pipeline, see <u>Edit a pipeline in CodePipeline</u>.

Create a pipeline (CLI)

To use the Amazon CLI to create a pipeline, you create a JSON file to define the pipeline structure, and then run the **create-pipeline** command with the --cli-input-json parameter.

<u> Important</u>

You cannot use the Amazon CLI to create a pipeline that includes partner actions. You must use the CodePipeline console instead.

For more information about pipeline structure, see <u>CodePipeline pipeline structure reference</u> and create-pipeline in the CodePipeline API Reference.

To create a JSON file, use the sample pipeline JSON file, edit it, and then call that file when you run the **create-pipeline** command.

Prerequisites:

You need the ARN of the service role you created for CodePipeline in <u>Getting started with</u> <u>CodePipeline</u>. You use the CodePipeline service role ARN in the pipeline JSON file when you run the **create-pipeline** command. For more information about creating a service role, see <u>Create the</u> <u>CodePipeline service role</u>. Unlike the console, running the **create-pipeline** command in the Amazon CLI does not have the option to create the CodePipeline service role for you. The service role must already exist.

You need the name of an S3 bucket where artifacts for the pipeline are stored. This bucket must be in the same Region as the pipeline. You use the bucket name in the pipeline JSON file when you run the **create-pipeline** command. Unlike the console, running the **create-pipeline** command in the Amazon CLI does not create an S3 bucket for storing artifacts. The bucket must already exist.

🚯 Note

You can also use the **get-pipeline** command to get a copy of the JSON structure of that pipeline, and then modify that structure in a plain-text editor.

To create the JSON file

- 1. At a terminal (Linux, OS X, or Unix) or command prompt (Windows), create a new text file in a local directory.
- 2. (Optional) You can add one or more variables at the pipeline level. You can reference this value in configuration of CodePipeline actions. You can add the variable names and values when you create the pipeline, and you can also choose to assign values when you start the pipeline in the console.

🚯 Note

While it is optional to add variables at the pipeline level, for a pipeline specified with variables at the pipeline level where no values are provided, the pipeline execution will fail.

A variable at the pipeline level is resolved at run time of pipeline. All variables are immutable, meaning that they cannot be updated after a value is assigned. Variables at the pipeline level with resolved values will display in the history for each execution.

You provide variables at the pipeline level using the variables attribute in the pipeline structure. In the following example, the variable Variable1 has a value of Value1.

Add this structure to your pipeline JSON, or to the example JSON in the following step. For more information about variables, including namespace information, see <u>Variables reference</u>.

- 3. Open the file in a plain-text editor and edit the values to reflect the structure you want to create. At a minimum, you must change the name of the pipeline. You should also consider whether you want to change:
 - The S3 bucket where artifacts for this pipeline are stored.
 - The source location for your code.
 - The deployment provider.
 - How you want your code deployed.
 - The tags for your pipeline.

The following two-stage sample pipeline structure highlights the values you should consider changing for your pipeline. Your pipeline likely contains more than two stages:

```
{
    "pipeline": {
        "roleArn": "arn:aws:iam::80398EXAMPLE::role/AWS-CodePipeline-Service",
        "stages": [
            {
                "name": "Source",
                "actions": [
                    {
                         "inputArtifacts": [],
                         "name": "Source",
                         "actionTypeId": {
                             "category": "Source",
                             "owner": "AWS",
                             "version": "1",
                             "provider": "S3"
                         },
                         "outputArtifacts": [
                             {
                                 "name": "MyApp"
                             }
                         ],
                         "configuration": {
                             "S3Bucket": "amzn-s3-demo-source-bucket",
                             "S3ObjectKey": "ExampleCodePipelineSampleBundle.zip",
                             "PollForSourceChanges": "false"
                         },
                         "runOrder": 1
                    }
                ]
            },
            {
                "name": "Staging",
                "actions": [
                    {
                         "inputArtifacts": [
                             {
                                 "name": "MyApp"
                             }
                         ],
                         "name": "Deploy-CodeDeploy-Application",
                         "actionTypeId": {
                             "category": "Deploy",
                             "owner": "AWS",
```

```
"version": "1",
                     "provider": "CodeDeploy"
                },
                 "outputArtifacts": [],
                 "configuration": {
                     "ApplicationName": "CodePipelineDemoApplication",
                     "DeploymentGroupName": "CodePipelineDemoFleet"
                },
                 "runOrder": 1
            }
        ]
    }
],
"artifactStore": {
    "type": "S3",
    "location": "codepipeline-us-east-2-250656481468"
},
"name": "MyFirstPipeline",
"version": 1,
"variables": [
    {
        "name": "Timeout",
        "defaultValue": "1000",
        "description": "description"
    }
  ]
},
"triggers": [
    {
        "providerType": "CodeStarSourceConnection",
        "gitConfiguration": {
            "sourceActionName": "Source",
            "push": [
                {
                     "tags": {
                         "includes": [
                             "v1"
                         ],
                         "excludes": [
                             "v2"
                         ]
                    }
                }
            ]
```

This example adds tagging to the pipeline by including the Project tag key and ProjectA value on the pipeline. For more information about tagging resources in CodePipeline, see Tagging resources.

Make sure the PollForSourceChanges parameter in your JSON file is set as follows:

"PollForSourceChanges": "false",

CodePipeline uses Amazon CloudWatch Events to detect changes in your CodeCommit source repository and branch or your S3 source bucket. The next step includes instructions to manually create these resources for your pipeline. Setting the flag to false disables periodic checks, which are not necessary when you are using the recommended change detection methods.

- 4. To create a build, test, or deploy action in a Region different from your pipeline, you must add the following to your pipeline structure. For instructions, see <u>Add a cross-Region action in</u> <u>CodePipeline</u>.
 - Add the Region parameter to your action's pipeline structure.
 - Use the artifactStores parameter to specify an artifact bucket for each Amazon Region where you have an action.
- 5. When you are satisfied with its structure, save your file with a name like **pipeline.json**.

To create a pipeline

1. Run the **create-pipeline** command and use the --cli-input-json parameter to specify the JSON file you created previously.

To create a pipeline named *MySecondPipeline* with a JSON file named pipeline.json that includes the name "*MySecondPipeline*" as the value for name in the JSON, your command would look like the following:

aws codepipeline create-pipeline --cli-input-json file://pipeline.json

A Important

Be sure to include file:// before the file name. It is required in this command.

This command returns the structure of the entire pipeline you created.

- 2. To view the pipeline, either open the CodePipeline console and choose it from the list of pipelines, or use the **get-pipeline-state** command. For more information, see <u>View pipelines</u> and details in CodePipeline.
- 3. If you use the CLI to create a pipeline, you must manually create the recommended change detection resources for your pipeline:
 - For a pipeline with a CodeCommit repository, you must manually create the CloudWatch Events rule, as described in Create an EventBridge rule for a CodeCommit source (CLI).
 - For a pipeline with an Amazon S3 source, you must manually create the CloudWatch Events rule and Amazon CloudTrail trail, as described in <u>Connecting to Amazon S3 source actions</u> that use EventBridge and Amazon CloudTrail.

Create a pipeline from static templates

You can create a pipeline in the console that uses a template to configure a pipeline with source code and properties that you specify. You must provide the source file location and information about the source providers you will use for your actions. You can specify a source action for Amazon ECR or any third-party repository supported by CodeConnections, such as GitHub.

The template will create a stack in Amazon CloudFormation for your pipeline that includes the following resources:

- A pipeline is created with the V2 pipeline type. In Pipeline type, choose one of the following options. Pipeline types differ in characteristics and price. For more information, see <u>Pipeline</u> types.
- A service role is created for your pipeline and referenced in the template.
- An artifact store is created using the default artifact store, such as the S3 artifact bucket designated as the default, for your pipeline in the Amazon Web Services Region you have selected for your pipeline.

To view the collection of open source starter templates that are used for the static template creation wizard, see the repository at <u>https://github.com/aws/codepipeline-starter-templates</u>.

When you use static templates to create a pipeline, the pipeline structure is configured in each template according to the needs of the use case. For example, the template for a deployment to Amazon CloudFormation is used as an example in this procedure. The template generates a pipeline named **DeployToCloudFormationService** with the following structure:

- A build stage that contains a source action with configuration that you specify in the wizard.
- A deployment stage with a deploy action and associated resource stack in Amazon CloudFormation.

When you use a static template to create a pipeline, CodePipeline creates the names of stages (source, build, staging). These names cannot be changed. You can use more specific names (for example, BuildToGamma or DeployToProd) to stages you add later.

Step 1: Choose your creation option

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, choose **Create pipeline**.

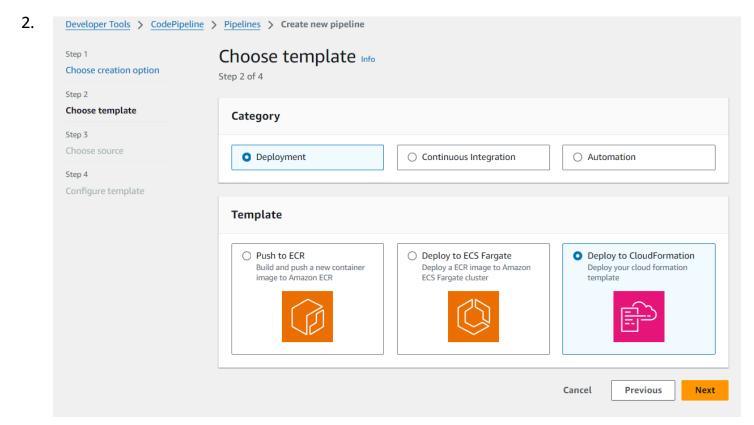
If this is your first time using CodePipeline, choose **Get Started**.

3. On the **Step 1: Choose creation option** page, under **Creation options**, choose the **Create pipeline from template** option. Choose **Next**.

Step 2: Choose template

Choose a template to create a pipeline with a deployment stage, automation, or a CI pipeline.

- 1. On the **Step 2: Choose template** page, do one of the following, and then choose **Next**:
 - Choose Deployment if you plan to create a deployment stage. View the options for templates that deploy to ECR or CloudFormation. For this example, choose Deployment, and then choose to deploy to CloudFormation.
 - Choose **Continuous Integration** if you plan to create a CI pipeline. View the options for CI pipelines, such as building to Gradle.
 - Choose **Automation** if you plan to create an automated pipeline. View the options for automation, such as scheduling a python build.



Choose template	Category					
Choose source Step 4	O Deployment	• Continuous Integration	O Automation			
Configure template	Template	Template				
	CI Build Gradle Build a gradle project	O CI Build NodeJS Build a node js project	O CI Build Maven Build a maven project			
	CI Build Python Build a python project					
			Cancel Previous Next			
Choose template	Category					
Choose source Step 4	O Deployment	O Continuous Integration	• Automation			
Configure template	Template					
	 Schedule a python build pipeline Build a python project periodically 	 Schedule a gradle build pipeline Build a gradle project periodically 	 Schedule a nodejs build pipeline Build a nodejs project periodically 			
	Schedule a maven build pipeline Build a maven project periodically					

Step 3: Choose source

- On the **Step 3: Choose source** page, in **Source provider**, choose the provider for the repository where your source code is stored, specify its required options, and then choose **Next step**.
 - For Bitbucket Cloud, GitHub (via GitHub App), GitHub Enterprise Server, GitLab.com, or GitLab self-managed:
 - 1. Under **Connection**, choose an existing connection or create a new one. To create or manage a connection for your GitHub source action, see <u>GitHub connections</u>.
 - 2. Choose the repository you want to use as the source location for your pipeline.

Choose to add a trigger or filter on trigger types to start your pipeline. For more information about working with triggers, see <u>Add trigger with code push or pull request</u> <u>event types</u>. For more information about filtering with glob patterns, see <u>Working with</u> <u>glob patterns in syntax</u>.

- 3. In **Output artifact format**, choose the format for your artifacts.
 - To store output artifacts from the GitHub action using the default method, choose CodePipeline default. The action accesses the files from the GitHub repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose Full clone. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Troubleshooting CodePipeline</u>. For a tutorial that shows you how to use the **Full clone** option, see <u>Tutorial: Use full clone with a GitHub pipeline</u> <u>source</u>.

- For Amazon ECR:
 - In **Repository name**, choose the name of your Amazon ECR repository.
 - In Image tag, specify the image name and version, if different from LATEST.
 - In **Output artifacts**, choose the output artifact default, such as MyApp, that contains the image name and repository URI information you want the next stage to use.

When you include an Amazon ECR source stage in your pipeline, the source action generates an imageDetail.json file as an output artifact when you commit a change. For

information about the imageDetail.json file, see <u>imageDetail.json file for Amazon ECS</u> blue/green deployment actions.

i Note

The object and file type must be compatible with the deployment system you plan to use (for example, Elastic Beanstalk or CodeDeploy). Supported file types might include .zip, .tar, and .tgz files. For more information about the supported container types for Elastic Beanstalk, see <u>Customizing and Configuring Elastic Beanstalk</u> <u>Environments</u> and <u>Supported Platforms</u>. For more information about deploying revisions with CodeDeploy, see <u>Uploading Your Application Revision</u> and <u>Prepare a</u> <u>Revision</u>.

Step 4: Configure template

For this example, the deployment to CloudFormation was selected. In this step, add configuration for your template.

Choose template Step 3	Template Details
Choose source	ConnectionArn The CodeConnections ARN for your Docker container source repository.
Step 4 Configure template	arn:aws:codeconnections:us-east-1:
	FullRepositoryId The full repository ID to use with your CodeConnections connection.
	·/MyGitHubRepo
	BranchName The branch name to use with your CodeConnections connection.
	main
	CodePipelineName The CodePipeline pipeline name that will deploy your cfn template.
	DeployToCloudFormationService2
	StackName The CloudFormation Stack Name that you want to create and/or update.
	DeployToCloudFormationService2
	TemplatePath The path in your source repository to the CloudFormation template to create and/or update your Sta
	template.yaml
	OutputFileName The path the output from the CloudFormation stack update will be written to.
	output.json

- 1. In **Step 4: Configure template**, in **Stack name**, enter a name for your pipeline.
- 2. Edit the placeholder IAM policy for the permissions that apply for your template.
- 3. Choose Create pipeline from template
- 4. A message displays stating that your pipeline resources are being created.

Step 5: View the pipeline

 Now that you've created your pipeline, you can view it in the CodePipeline console and view the stack in Amazon CloudFormation. The pipeline starts to run after you create it. For more information, see <u>View pipelines and details in CodePipeline</u>. For more information about making changes to your pipeline, see Edit a pipeline in CodePipeline.

Edit a pipeline in CodePipeline

A pipeline describes the release process that you want Amazon CodePipeline to follow, including stages and actions that must be completed. You can edit a pipeline to add or remove these elements. However, when you edit a pipeline, values such as the pipeline name or pipeline metadata cannot be changed.

You can edit your pipeline type, variables, and triggers using the pipeline edit page. You can also add or change stages and actions in your pipeline.

Unlike creating a pipeline, editing a pipeline does not rerun the most recent revision through the pipeline. If you want to run the most recent revision through a pipeline you've just edited, you must manually rerun it. Otherwise, the edited pipeline runs the next time you make a change to a source location configured in the source stage. For information, see <u>Start a pipeline manually</u>.

You can add actions to your pipeline that are in an Amazon Region different from your pipeline. When an Amazon Web Services service is the provider for an action, and this action type/provider type are in a different Amazon Region from your pipeline, this is a cross-Region action. For more information about cross-Region actions, see <u>Add a cross-Region action in CodePipeline</u>.

CodePipeline uses change detection methods to start your pipeline when a source code change is pushed. These detection methods are based on source type:

• CodePipeline uses Amazon CloudWatch Events to detect changes in your CodeCommit source repository or your Amazon S3 source bucket.

🚺 Note

Topics

- Edit a pipeline (console)
- Edit a pipeline (Amazon CLI)

Edit a pipeline (console)

You can use the CodePipeline console to add, edit, or remove stages in a pipeline and to add, edit, or remove actions in a stage.

When you update a pipeline, CodePipeline gracefully completes all the running actions and then fails the stages and pipeline executions where the running actions were completed. When a pipeline is updated, you will need to re-run your pipeline. For more information on running a pipeline, see <u>Start a pipeline manually</u>.

To edit a pipeline

 Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit. This opens a detailed view of the pipeline, including the state of each of the actions in each stage of the pipeline.
- 3. On the pipeline details page, choose **Edit**.
- 4. To edit the pipeline type, choose **Edit** on the **Edit: Pipeline properties** card. Choose one of the following options, and then choose **Done**.
 - V1 type pipelines have a JSON structure that contains standard pipeline, stage, and actionlevel parameters.
 - V2 type pipelines have the same structure as a V1 type, along with additional parameter support, such as triggers and pipeline-level variables.

Pipeline types differ in characteristics and price. For more information, see Pipeline types.

5. To edit the pipeline variables, choose **Edit variables** on the **Edit: Variables** card. Add or change variables for the pipeline level, and then choose **Done**.

For more information about variables at the pipeline level, see <u>Variables reference</u>. For a tutorial with a pipeline-level variable that is passed at the time of the pipeline execution, see <u>Tutorial</u>: Use pipeline-level variables.

🚯 Note

While it is optional to add variables at the pipeline level, for a pipeline specified with variables at the pipeline level where no values are provided, the pipeline execution will fail.

6. To edit the pipeline triggers, choose **Edit triggers** on the **Edit: Triggers** card. Add or change triggers, and then choose **Done**.

For more information about adding triggers, see the steps for creating a connection to Bitbucket Cloud, GitHub (via GitHub App), GitHub Enterprise Server, GitLab.com, or GitLab selfmanaged, such as <u>GitHub connections</u>.

- 7. To edit stages and actions on the **Edit** page, do one of the following:
 - To edit a stage, choose **Edit stage**. You can add actions in serial and parallel with existing actions:

You can also edit actions in this view by choosing the edit icon for those actions. To delete an action, choose the delete icon on that action.

- To edit an action, choose the edit icon for that action, and then on **Edit action**, change the values. Items marked with an asterisk (*) are required.
 - For a CodeCommit repository name and branch, a message appears showing the Amazon CloudWatch Events rule to be created for this pipeline. If you remove the CodeCommit source, a message appears showing the Amazon CloudWatch Events rule to be deleted.
 - For an Amazon S3 source bucket, a message appears showing the Amazon CloudWatch Events rule and Amazon CloudTrail trail to be created for this pipeline. If you remove the Amazon S3 source, a message appears showing the Amazon CloudWatch Events rule and Amazon CloudTrail trail to be deleted. If the Amazon CloudTrail trail is in use by other pipelines, the trail is not removed and the data event is deleted.
- To add a stage, choose **+ Add stage** at the point in the pipeline where you want to add a stage. Provide a name for the stage, and then add at least one action to it. Items marked with an asterisk (*) are required.
- To delete a stage, choose the delete icon on that stage. The stage and all of its actions are deleted.
- To configure a stage to roll back automatically on failure, choose **Edit stage**, and then choose the checkbox **Configure automatic rollback on stage failure**.

For example, if you wanted to add a serial action to a stage in a pipeline:

- 1. In the stage where you want to add your action, choose **Edit stage**, and then choose **+ Add action group**.
- 2.

In **Edit action**, in **Action name**, enter the name of your action. The **Action provider** list displays provider options by category. Look for the category (for example, **Deploy**). Under the category, choose the provider (for example, **Amazon CodeDeploy**). In **Region**, choose the Amazon Region where the resource is created or where you plan to create it. The **Region** field designates where the Amazon resources are created for this action type and provider type. This field only displays for actions where the action provider is an Amazon Web Services service. The **Region** field defaults to the same Amazon Region as your pipeline.

For examples of adding action providers and using the default fields for each provider, see <u>Create a custom pipeline (console)</u>.

To add CodeBuild as a build action or test action to a stage, see <u>Use CodePipeline with</u> <u>CodeBuild to Test Code and Run Builds</u> in the *CodeBuild User Guide*.

í) Note

Some action providers, such as GitHub, require you to connect to the provider's website before you can complete the configuration of the action. When you connect to a provider's website, make sure you use the credentials for that website. Do not use your Amazon credentials.

3. When you have finished configuring your action, choose **Save**.

1 Note

You cannot rename a stage in the console view. You can add a stage with the name you want to change, and then delete the old one. Make sure you have added all the actions you want in that stage before you delete the old one.

8. When you have finished editing your pipeline, choose **Save** to return to the summary page.

A Important

After you save your changes, you cannot undo them. You must edit the pipeline again. If a revision is running through your pipeline when you save your changes, the run is not completed. If you want a specific commit or change to run through the edited pipeline, you must manually run it through the pipeline. Otherwise, the next commit or change runs automatically through the pipeline.

9. To test your action, choose **Release change** to process that commit through the pipeline and commit a change to the source specified in the source stage of the pipeline. Or follow the steps in <u>Start a pipeline manually</u> to use the Amazon CLI to manually release a change.

Edit a pipeline (Amazon CLI)

You can use the **update-pipeline** command to edit a pipeline.

When you update a pipeline, CodePipeline gracefully completes all the running actions and then fails the stages and pipeline executions where the running actions were completed. When a pipeline is updated, you will need to re-run your pipeline. For more information on running a pipeline, see <u>Start a pipeline manually</u>.

<u> Important</u>

Although you can use the Amazon CLI to edit pipelines that include partner actions, you must not manually edit the JSON of a partner action. If you do so, the partner action fails after you update the pipeline.

To edit a pipeline

 Open a terminal session (Linux, OS X, or Unix) or command prompt (Windows) and run the get-pipeline command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, enter the following command:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Open the JSON file in any plain-text editor and modify the structure of the file to reflect the changes you want to make to the pipeline. For example, you can add or remove stages, or add another action to an existing stage.

The following example shows how you would add another deployment stage in the pipeline.json file. This stage runs after the first deployment stage named *Staging*.

🚯 Note

This is just a portion of the file, not the entire structure. For more information, see CodePipeline pipeline structure reference.

```
{
    "name": "Staging",
    "actions": [
            {
                 "inputArtifacts": [
                     {
                         "name": "MyApp"
                     }
                ],
                 "name": "Deploy-CodeDeploy-Application",
                 "actionTypeId": {
                     "category": "Deploy",
                     "owner": "AWS",
                     "version": "1",
                     "provider": "CodeDeploy"
                },
                 "outputArtifacts": [],
                "configuration": {
                     "ApplicationName": "CodePipelineDemoApplication",
                     "DeploymentGroupName": "CodePipelineDemoFleet"
                },
                "runOrder": 1
            }
        ]
```

```
},
        {
            "name": "Production",
             "actions": [
                     {
                         "inputArtifacts": [
                             {
                                  "name": "MyApp"
                             7
                         ],
                         "name": "Deploy-Second-Deployment",
                         "actionTypeId": {
                             "category": "Deploy",
                             "owner": "AWS",
                             "version": "1",
                             "provider": "CodeDeploy"
                         },
                         "outputArtifacts": [],
                         "configuration": {
                         "ApplicationName": "CodePipelineDemoApplication",
                         "DeploymentGroupName": "CodePipelineProductionFleet"
                         },
                         "runOrder": 1
                     }
                ]
        }
    ]
}
```

For information about using the CLI to add an approval action to a pipeline, see <u>Add a manual</u> <u>approval action to a pipeline in CodePipeline</u>.

Make sure the PollForSourceChanges parameter in your JSON file is set as follows:

"PollForSourceChanges": "false",

CodePipeline uses Amazon CloudWatch Events to detect changes in your CodeCommit source repository and branch or your Amazon S3 source bucket. The next step includes instructions for creating these resources manually. Setting the flag to false disables periodic checks, which are not required when you use the recommended change detection methods.

- 3. To add a build, test, or deploy action in a Region different from your pipeline, you must add the following to your pipeline structure. For detailed instructions, see <u>Add a cross-Region</u> action in CodePipeline.
 - Add the Region parameter to your action's pipeline structure.
 - Use the artifactStores parameter to specify an artifact bucket for each Region where you have an action.
- 4. If you are working with the pipeline structure retrieved using the get-pipeline command, you must modify the structure in the JSON file. You must remove the metadata lines from the file so the update-pipeline command can use it. Remove the section from the pipeline structure in the JSON file (the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields).

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
}
```

Save the file.

- 5. If you use the CLI to edit a pipeline, you must manually manage the recommended change detection resources for your pipeline:
 - For a CodeCommit repository, you must create the CloudWatch Events rule, as described in Create an EventBridge rule for a CodeCommit source (CLI).
 - For an Amazon S3 source, you must create the CloudWatch Events rule and Amazon CloudTrail trail, as described in <u>Connecting to Amazon S3 source actions that use</u> EventBridge and Amazon CloudTrail.
- 6. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚺 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must start the pipeline manually to run that revision through the updated pipeline.

7. Open the CodePipeline console and choose the pipeline you just edited.

The pipeline shows your changes. The next time you make a change to the source location, the pipeline runs that revision through the revised structure of the pipeline.

8. To manually run the last revision through the revised structure of the pipeline, run the **start-pipeline-execution** command. For more information, see <u>Start a pipeline manually</u>.

For more information about the structure of a pipeline and expected values, see <u>CodePipeline</u> pipeline structure reference and <u>Amazon CodePipeline API Reference</u>.

View pipelines and details in CodePipeline

You can use the Amazon CodePipeline console or the Amazon CLI to view details about pipelines associated with your Amazon account.

Topics

- View pipelines (console)
- View action details in a pipeline (console)
- View the pipeline ARN and service role ARN (console)
- View pipeline details and history (CLI)
- View rule results for stage conditions in execution history

View pipelines (console)

You can view status, transitions, and artifact updates for a pipeline.

1 Note

After an hour, the detailed view of a pipeline stops refreshing automatically in your browser. To view current information, refresh the page.

To view pipelines

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The **Pipelines** page displays. A list of all your pipelines for that Region are shown.

The name, type, status, version, creation date, and date when last modified of all pipelines associated with your Amazon account are displayed, along with the most recently started execution time.

2. The status for the five most recent executions is shown.

Pipe	clines Info	🗘 Notify 🔻 🛛 V	/iew history Releas	e change Delete pipeline	Create pipeline
Q					< 1 > ©
	Name	Latest execution status	Latest execution started	Most recent executions	
0	Pipeline-trigger (Type: V2 Execution mode: SUPERSEDED)	Succeeded	2 days ago	$\oslash \oslash \oslash \ominus \ominus$ View detail	s
0	check1 (Type: V2 Execution mode: SUPERSEDED)	⊗ Failed	2 days ago	🛞 🛞 🛞 🔗 🛇 View detail	s
0	tr-pi2 (Type: V2 Execution mode: QUEUED)	⊖ Stopped	19 days ago	⊘ ⊗ View details	
0	Pipeline-Stack (Type: V1 Execution mode: SUPERSEDED)	⊗ Failed	2 months ago	🛞 🛞 🛞 View details	
0	Pipeline-ChangeSet (Type: V2 Execution mode: QUEUED)	❸ Failed	2 months ago	🛞 🛞 🛞 View details	

Choose **View details** next to a specific row to display a details dialog box listing the most recent executions.

Most recent executions					
Trigger StartPipelineExecution	- assumed-role,		2	Î	
Pipeline execution ID	Status	Last updated			
7cb97af6	In progress	51 minutes ago			
Trigger					
StartPipelineExecution	- assumed-role/				
Pipeline execution ID	Status	Last updated			
b289be6e	⊘ Succeeded	1 hour ago			
Trigger					
Webhook - connection	/40d122c4-23fb-48	3bf-a08f-	_Ľ		
Pipeline execution ID	Status	Last updated			
049c2110	Succeeded Succeeded	3 months ago			
Trigger					
Webhook - connection	/40d122c4-23fb-48	3bf-a08f	2		
Pipeline execution ID	Status	Last updated			
3dcaf66a	Succeeded	-			
Trigger					
Webhook - connection	/40d122c4-23fb-48	3bf-a08f-	2		
				· · ·	
				Done	

To view details about the most recent executions for the pipeline, choose **View history**. For past executions, you can view revision details associated with source artifacts, such as execution IDs, status, start and end times, duration, and commit IDs and messages.

Note

For a pipeline in PARALLEL execution mode, the main pipeline view does not show the pipeline structure or in-progress executions. For a pipeline in PARALLEL execution mode, you access the pipeline structure by choosing the ID for the execution you want to view from the execution history page. Choose **History** in the left navigation, choose the execution ID for the parallel execution, and then view the pipeline on the **Visualization** tab.

3. To see details for a single pipeline, in **Name**, choose the pipeline. A detailed view of the pipeline, including the state of each action in each stage and the state of the transitions, is displayed.

Source Succeeded Pipeline execution ID: <u>b289be6e-e25d-4f61-a5c3-821028cfe4d3</u>	
Source GitHub (Version 2) [2]	
Succeeded - <u>1 minute 200</u> 2de85792 2 View details	
2de8579a 🖾 Source: Add files via upload	0
Disable transition	
Build Succeeded Pipeline execution ID: <u>b289be6e-e25d-4f61-a5c3-821028cfe4d3</u>	
Build AWS CodeBuild Succeeded - Just now	
View details 2de8579a Zde8579a Zde8579a	

The graphical view displays the following information for each stage:

- The stage name.
- Every action configured for the stage.
- The state of transitions between stages (enabled or disabled), as indicated by the state of the arrow between stages. An enabled transition is indicated by an arrow with a **Disable transition** button next to it. A disabled transition is indicated by an arrow with a strikeout under it and an **Enable transition** button next to it.
- A color bar to indicate the status of the stage:

- Gray: No executions yet
- Blue: In progress
- Green: Succeeded
- Red: Failed

The graphical view also displays the following information about actions in each stage:

- The name of the action.
- The provider of the action, such as CodeDeploy.
- When the action was last run.
- Whether the action succeeded or failed.
- Links to other details about the last run of the action, where available.
- Details about the source revisions that are running through the latest pipeline execution in the stage or, for CodeDeploy deployments, the latest source revisions that were deployed to target instances.
- A **View details** button that opens a dialog box with details about the action execution, logs, and action configuration.

🚯 Note

The **Logs** tab is available for CodeBuild and Amazon CloudFormation actions that have run in the account of the pipeline.

- 4. To view the details of the provider of the action, choose the provider. For example, in the preceding example pipeline, if you choose CodeDeploy in either the Staging or Production stages the CodeDeploy console page for the deployment group configured for that stage is displayed.
- To see the progress for an action is displayed next to an action in progress (indicated by an In Progress message). If the action is in progress, you see the incremental progress and the steps or actions as they occur.
- 6. To approve or reject actions that have been configured for manual approval, choose **Review**.
- 7. To retry actions in a stage that were not completed successfully, choose **Retry**.
- 8. The status from the last time the action ran, including the results of that action (**Succeeded** or **Failed**) is displayed.

View action details in a pipeline (console)

You can view details for a pipeline, including details for actions in each stage.

í) Note

After an hour, the detailed view of a pipeline stops refreshing automatically in your browser. To view current information, refresh the page.

To view action details in a pipeline

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The **Pipelines** page displays.

2. On any action, choose **View details** to open a dialog box with details about the action execution, logs, and action configuration.

í) Note

The Logs tab is available for CodeBuild and Amazon CloudFormation actions.

3. To see the action summary for an action in a stage of a pipeline, choose **View details** on the action, and then choose the **Summary** tab.

Action execution details Action name: Build Status: Succeeded		×
Summary Logs Configuration		
Status	Last updated	
⊘ Succeeded	1 minute ago	
Action execution ID		
850739e4-13ef-4de8-a721-32c87727a1c7		
Message		
-		
Execution details		
View in CodeBuild 🖸		

Done

4. To see the action logs for an action with logs, choose **View details** on the action, and then choose the **Logs** tab.

Summary Logs	Configuration		
Succeeded	Start time: 3 minut	es ago Ci	urrent phase: COMPLETED
Showing the last 51 line	s of the build log. <u>View entire log</u>		
	∧ She	ow previous logs	
2 [Container] 2024/0 3 [Container] 2024/0 4 [Container] 2024/0 5 [Container] 2024/0 6 [Container] 2024/0 7 [Container] 2024/0 8 [Container] 2024/0 9 [Container] 2024/0 10 [Container] 2024/0 11 Installing Node.js 12 13 [Container] 2024/0 14 copying : not	1/10 19:23:36.898049 Running comman	WNLOAD_SOURCE DAD_SOURCE DIR=/codebuild/output/src180 is /codebuild/readonly/build und for phase name: install lient timeout to higher time ironment variables ejs' runtime version '12' ba d echo "Installing Node.js v	spec.yml out for S3 source used on manual selections
16 17 [Container] 2024/0 18 [Container] 2024/0 19 [Container] 2024/0 22850a87b0f4 20 [Container] 2024/0 21 [Container] 2024/0 22 [Container] 2024/0 23 [Container] 2024/0	<pre>https://www.mpm.orivito/ https://wwww.mpm.orivito/ https://www.mpm.orivito/ https://www.mpm</pre>	ialize cache download: no pa m agent with target id: code pdated ssm agent configurati th agent n YAML: 2 mmands	ths specified to be cached build:f79dc603-3eb0-48ff-970e-

5. To see the configuration details for an action, choose the **Configuration** tab.

Action execution of Action name: Build Sta			×
Summary Logs	Configuration		
Variable namespace	BuildVariables		
Input artifact	SourceArtifact		
Output artifact	BuildArtifact		
ProjectName	cb-porject		
			Done

View the pipeline ARN and service role ARN (console)

You can use the console to view pipeline settings, such as the pipeline ARN, the service role ARN, and the pipeline artifact store.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account will be displayed.

- Choose the name of your pipeline, and then choose Settings in the left-hand navigation pane. The page shows the following:
 - The pipeline name
 - The pipeline Amazon Resource Name (ARN)

The pipeline ARN is constructed in this format:

arn:aws:codepipeline:region:account:pipeline-name

Sample pipeline ARN:

arn:aws:codepipeline:us-east-2:80398EXAMPLE:MyFirstPipeline

- The CodePipeline service role ARN for your pipeline
- The pipeline version
- The name and location of the artifact store for the pipeline

View pipeline details and history (CLI)

You can run the following commands to view details about your pipelines and pipeline executions:

- **list-pipelines** command to view a summary of all of the pipelines associated with your Amazon account.
- get-pipeline command to review details of a single pipeline.
- list-pipeline-executions to view summaries of the most recent executions for a pipeline.
- **get-pipeline-execution** to view information about an execution of a pipeline, including details about artifacts, the pipeline execution ID, and the name, version, and status of the pipeline.
- get-pipeline-state command to view pipeline, stage, and action status.
- list-action-executions to view action execution details for a pipeline.
- Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the <u>list-pipelines</u> command:

aws codepipeline list-pipelines

This command returns a list of all of the pipelines associated with your Amazon account.

 To view details about a pipeline, run the <u>get-pipeline</u> command, specifying the unique name of the pipeline. For example, to view details about a pipeline named *MyFirstPipeline*, enter the following:

aws codepipeline get-pipeline --name MyFirstPipeline

This command returns the structure of the pipeline.

View rule results for stage conditions in execution history

You can view the rule results for an execution where a stage condition ran a rule and engaged a result for the stage, such as rollback or failure.

Valid status values for conditions and rules are as follows: InProgress | Failed | Errored | Succeeded | Cancelled | Abandoned | Overridden

View rule results for stage conditions in execution history (console)

You can use the console to view the rule results for an execution where a stage condition ran a rule and engaged a result for the stage.

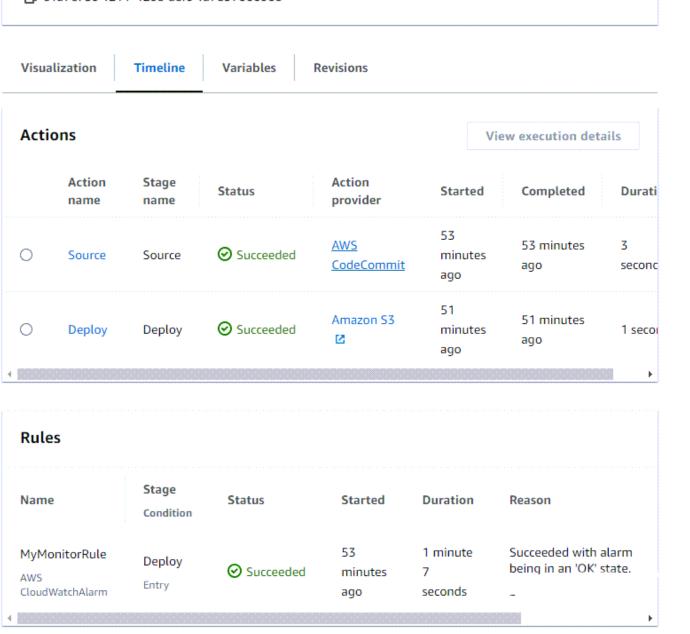
View rule results for stage conditions (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to view.
- 3. Choose **History**, and then choose the execution. On the history page, choose the **Timeline** tab. Under **Rules**, view the rule results for the execution.

🗗 e1a7e739-t211-420e-aet9-ta7837666968



View rule results for stage conditions with list-rule-executions (CLI)

You can use the CLI to view the rule results for an execution where a stage condition ran a rule and engaged a result for the stage.

Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon
 CLI to run the list-rule-executions command for a pipeline named *MyPipeline*:

```
aws codepipeline list-rule-executions --pipeline-name MyFirstPipeline
```

This command returns a list of all of the completed rule executions associated with the pipeline.

The following example shows the returned data for a pipeline with a stage condition where the rule is named *MyMonitorRule*.

```
{
    "ruleExecutionDetails": [
        {
            "pipelineExecutionId": "e1a7e739-f211-420e-aef9-fa7837666968",
            "ruleExecutionId": "3aafc0c7-0e1c-44f1-b357-d1b16a28e483",
            "pipelineVersion": 9,
            "stageName": "Deploy",
            "ruleName": "MyMonitorRule",
            "startTime": "2024-07-29T15:55:01.271000+00:00",
            "lastUpdateTime": "2024-07-29T15:56:08.682000+00:00",
            "status": "Succeeded",
            "input": {
                "ruleTypeId": {
                    "category": "Rule",
                    "owner": "AWS",
                    "provider": "CloudWatchAlarm",
                    "version": "1"
                },
                "configuration": {
                    "AlarmName": "CWAlarm",
                    "WaitTime": "1"
                },
                "resolvedConfiguration": {
                    "AlarmName": "CWAlarm",
                    "WaitTime": "1"
                },
                "region": "us-east-1",
                "inputArtifacts": []
            },
            "output": {
                "executionResult": {
                    "externalExecutionSummary": "Succeeded with alarm 'CWAlarm'
 being i
```

```
n an 'OK' state."
}
}
}
```

Delete a pipeline in CodePipeline

You can always edit a pipeline to change its functionality, but you might decide you want to delete it instead. You can use the Amazon CodePipeline console or the **delete-pipeline** command in the Amazon CLI to delete a pipeline.

Topics

- Delete a pipeline (console)
- Delete a pipeline (CLI)

Delete a pipeline (console)

To delete a pipeline

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to delete.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose **Delete**.
- 5. Type **delete** in the field to confirm, and then choose **Delete**.

<u> Important</u>

This action cannot be undone.

Delete a pipeline (CLI)

To use the Amazon CLI to manually delete a pipeline, use the <u>delete-pipeline</u> command.

<u> Important</u>

Deleting a pipeline is irreversible. There is no confirmation dialog box. After the command is run, the pipeline is deleted, but none of the resources used in the pipeline are deleted. This makes it easier to create a new pipeline that uses those resources to automate the release of your software.

To delete a pipeline

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the **delete-pipeline** command, specifying the name of the pipeline you want to delete. For example, to delete a pipeline named *MyFirstPipeline*:

aws codepipeline delete-pipeline --name MyFirstPipeline

This command returns nothing.

2. Delete any resources you no longer need.

🚺 Note

Deleting a pipeline does not delete the resources used in the pipeline, such as the CodeDeploy or Elastic Beanstalk application you used to deploy your code, or, if you created your pipeline from the CodePipeline console, the Amazon S3 bucket CodePipeline created to store the artifacts of your pipelines. Make sure that you delete resources that are no longer required so that you are not charged for them in the future. For example, when you use the console to create a pipeline for the first time, CodePipeline creates one Amazon S3 bucket to store all artifacts for all of your pipelines. If you have deleted all of your pipelines, follow the steps in <u>Deleting a</u> <u>Bucket</u>.

Create a pipeline in CodePipeline that uses resources from another Amazon account

You might want to create a pipeline that uses resources created or managed by another Amazon account. For example, you might want to use one account for your pipeline and another for your CodeDeploy resources.

Note

When you create a pipeline with actions from multiple accounts, you must configure your actions so that they can still access artifacts within the limitations of cross-account pipelines. The following limitations apply to cross-account actions:

- In general, an action can only consume an artifact if:
 - The action is in the same account as the pipeline account OR
 - The artifact was created in the pipeline account for an action in another account OR
 - The artifact was produced by a previous action in the same account as the action

In other words, you cannot pass an artifact from one account to another if neither account is the pipeline account.

- Cross-account actions are not supported for the following action types:
 - Jenkins build actions

For this example, you must create an Amazon Key Management Service (Amazon KMS) key to use, add the key to the pipeline, and set up account policies and roles to enable cross-account access. For an Amazon KMS key, you can use the key ID, the key ARN, or the alias ARN.

🚺 Note

Aliases are recognized only in the account that created the KMS key. For cross-account actions, you can only use the key ID or key ARN to identify the key. Cross-account actions involve using the role from the other account (AccountB), so specifying the key ID will use the key from the other account (AccountB).

In this walkthrough and its examples, *AccountA* is the account originally used to create the pipeline. It has access to the Amazon S3 bucket used to store pipeline artifacts and the service role used by Amazon CodePipeline. *AccountB* is the account originally used to create the CodeDeploy application, deployment group, and service role used by CodeDeploy.

For *AccountA* to edit a pipeline to use the CodeDeploy application created by *AccountB*, *AccountA* must:

- Request the ARN or account ID of AccountB (in this walkthrough, the AccountB ID is 012ID_ACCOUNT_B).
- Create or use an Amazon KMS customer managed key in the Region for the pipeline, and grant
 permissions to use that key to the service role (*CodePipeline_Service_Role*) and *AccountB*.
- Create an Amazon S3 bucket policy that grants AccountB access to the Amazon S3 bucket (for example, codepipeline-us-east-2-1234567890).
- Create a policy that allows AccountA to assume a role configured by AccountB, and attach that
 policy to the service role (CodePipeline_Service_Role).
- Edit the pipeline to use the customer managed Amazon KMS key instead of the default key.

For *AccountB* to allow access to its resources to a pipeline created in *AccountA*, *AccountB* must:

- Request the ARN or account ID of AccountA (in this walkthrough, the AccountA ID is 012ID_ACCOUNT_A).
- Create a policy applied to the <u>Amazon EC2 instance role</u> configured for CodeDeploy that allows access to the Amazon S3 bucket (*codepipeline-us-east-2-1234567890*).
- Create a policy applied to the <u>Amazon EC2 instance role</u> configured for CodeDeploy that allows access to the Amazon KMS customer managed key used to encrypt the pipeline artifacts in <u>AccountA</u>.
- Configure and attach an IAM role (*CrossAccount_Role*) with a trust relationship policy that allows the CodePipeline service role in *AccountA* to assume the role.
- Create a policy that allows access to the deployment resources required by the pipeline and attach it to *CrossAccount_Role*.
- Create a policy that allows access to the Amazon S3 bucket (*codepipeline-us-east-2-1234567890*) and attach it to *CrossAccount_Role*.

Topics

Create a pipeline that uses resources from another account

- Prerequisite: Create an Amazon KMS encryption key
- Step 1: Set up account policies and roles
- Step 2: Edit the pipeline

Prerequisite: Create an Amazon KMS encryption key

Customer-managed keys are specific to a Region, as are all Amazon KMS keys. You must create your customer managed Amazon KMS key in the same Region where the pipeline was created (for example, us-east-2).

To create a customer managed key in Amazon KMS

- 1. Sign in to the Amazon Web Services Management Console with *AccountA* and open the Amazon KMS console.
- 2. On the left, choose **Customer managed keys**.
- 3. Choose Create key. In Configure key, leave the Symmetric default selected and choose Next.
- 4. In **Alias**, enter an alias to use for this key (for example, *PipelineName-Key*). Optionally, provide a description and tags for this key, and then choose **Next**.
- 5. In **Define Key Administrative Permissions**, choose the role or roles you want to act as administrators for this key, and then choose **Next**.
- 6. In Define Key Usage Permissions, under This Account, select the name of the service role for the pipeline (for example, CodePipeline_Service_Role). Under Other Amazon accounts, choose Add another Amazon account. Enter the account ID for AccountB to complete the ARN, and then choose Next.
- 7. In **Review and edit key policy**, review the policy, and then choose **Finish**.
- 8. From the list of keys, choose the alias of your key and copy its ARN (for example, *arn:aws:kms:us-*

east-2:012ID_ACCOUNT_A:key/222222-3333333-4444-556677EXAMPLE). You will need this when you edit your pipeline and configure policies.

Step 1: Set up account policies and roles

After you create the Amazon KMS key, you must create and attach policies that will enable the cross-account access. This requires actions from both *AccountA* and *AccountB*.

Topics

- Configure policies and roles in the account that will create the pipeline (AccountA)
- Configure policies and roles in the account that owns the Amazon resource (AccountB)

Configure policies and roles in the account that will create the pipeline (*AccountA*)

To create a pipeline that uses CodeDeploy resources associated with another Amazon account, *AccountA* must configure policies for both the Amazon S3 bucket used to store artifacts and the service role for CodePipeline.

To create a policy for the Amazon S3 bucket that grants access to AccountB (console)

- Sign in to the Amazon Web Services Management Console with AccountA and open the Amazon S3 console at <u>https://console.amazonaws.cn/s3/</u>.
- 2. In the list of Amazon S3 buckets, choose the Amazon S3 bucket where artifacts for your pipelines are stored. This bucket is named codepipeline-*region-1234567EXAMPLE*, where *region* is the Amazon Region in which you created the pipeline and *1234567EXAMPLE* is a ten-digit random number that ensures the bucket name is unique (for example, *codepipeline-us-east-2-1234567890*).
- 3. On the detail page for the Amazon S3 bucket, choose **Properties**.
- 4. In the properties pane, expand **Permissions**, and then choose **Add bucket policy**.

🚯 Note

If a policy is already attached to your Amazon S3 bucket, choose **Edit bucket policy**. You can then add the statements in the following example to the existing policy. To add a new policy, choose the link, and follow the instructions in the Amazon Policy Generator. For more information, see <u>Overview of IAM Policies</u>.

5. In the **Bucket Policy Editor** window, type the following policy. This will allow *AccountB* access to the pipeline artifacts, and will give *AccountB* the ability to add output artifacts if an action, such as a custom source or build action, creates them.

In the following example, the ARN is for *AccountB* is *012ID_ACCOUNT_B*. The ARN for the Amazon S3 bucket is *codepipeline-us-east-2-1234567890*. Replace these ARNs with the ARN for the account you want to allow access and the ARN for the Amazon S3 bucket:

```
{
 "Version": "2012-10-17",
 "Id": "SSEAndSSLPolicy",
 "Statement": [
{
  "Sid": "DenyUnEncryptedObjectUploads",
  "Effect": "Deny",
  "Principal": "*",
  "Action": "s3:PutObject",
  "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*",
  "Condition": {
 "StringNotEquals": {
 "s3:x-amz-server-side-encryption": "aws:kms"
 }
  }
},
{
  "Sid": "DenyInsecureConnections",
  "Effect": "Deny",
  "Principal": "*",
  "Action": "s3:*",
  "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*",
  "Condition": {
 "Bool": {
    "aws:SecureTransport": false
 }
 }
 },
{
  "Sid": "",
  "Effect": "Allow",
  "Principal": {
 "AWS": "arn:aws:iam::012ID_ACCOUNT_B:root"
 },
  "Action": [
           "s3:Get*",
           "s3:Put*"
       ],
  "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*"
},
{
  "Sid": "",
  "Effect": "Allow",
```

```
"Principal": {
    "AWS": "arn:aws:iam::012ID_ACCOUNT_B:root"
    },
    "Action": "s3:ListBucket",
    "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890"
    }
    ]
}
```

- 6. Choose **Save**, and then close the policy editor.
- 7. Choose **Save** to save the permissions for the Amazon S3 bucket.

To create a policy for the service role for CodePipeline (console)

- 1. Sign in to the Amazon Web Services Management Console with *AccountA* and open the IAM console at https://console.amazonaws.cn/iam/.
- 2. In the navigation pane, choose **Roles**.
- 3. In the list of roles, under **Role Name**, choose the name of the service role for CodePipeline.
- 4. On the **Permissions** tab, choose **Add inline policy**.
- Choose the JSON tab, and enter the following policy to allow AccountB to assume the role. In the following example, 012ID_ACCOUNT_B is the ARN for AccountB:

```
{
    "Version": "2012-10-17",
    "Statement": {
        "Effect": "Allow",
        "Action": "sts:AssumeRole",
        "Resource": [
            "arn:aws:iam::012ID_ACCOUNT_B:role/*"
        ]
    }
}
```

- 6. Choose **Review policy**.
- 7. In **Name**, enter a name for this policy. Choose **Create policy**.

Configure policies and roles in the account that owns the Amazon resource (*AccountB*)

When you create an application, deployment, and deployment group in CodeDeploy, you also create an <u>Amazon EC2 instance role</u>. (This role is created for you if you use the Run Deployment Walkthrough wizard, but you can also create it manually.) For a pipeline created in *AccountA* to use CodeDeploy resources created in *AccountB*, you must:

- Configure a policy for the instance role that allows it to access the Amazon S3 bucket where pipeline artifacts are stored.
- Create a second role in *AccountB* configured for cross-account access.

This second role must not only have access to the Amazon S3 bucket in *AccountA*, it must also contain a policy that allows access to the CodeDeploy resources and a trust relationship policy that allows the CodePipeline service role in *AccountA* to assume the role.

🚯 Note

These policies are specific to setting up CodeDeploy resources to be used in a pipeline created using a different Amazon account. Other Amazon resources will require policies specific to their resource requirements.

To create a policy for the Amazon EC2 instance role configured for CodeDeploy (console)

- 1. Sign in to the Amazon Web Services Management Console with *AccountB* and open the IAM console at https://console.amazonaws.cn/iam/.
- 2. In the navigation pane, choose **Roles**.
- 3. In the list of roles, under Role Name, choose the name of the service role used as the Amazon EC2 instance role for the CodeDeploy application. This role name can vary, and more than one instance role can be used by a deployment group. For more information, see <u>Create an IAM</u> Instance Profile for your Amazon EC2 Instances.
- 4. On the **Permissions** tab, choose **Add inline policy**.
- Choose the JSON tab, and enter the following policy to grant access to the Amazon S3 bucket used by AccountA to store artifacts for pipelines (in this example, codepipeline-useast-2-1234567890):

```
{
   "Version": "2012-10-17",
   "Statement": [
     {
       "Effect": "Allow",
       "Action": [
         "s3:Get*"
       ],
       "Resource": [
         "arn:aws:s3:::codepipeline-us-east-2-1234567890/*"
       ]
     },
     {
       "Effect": "Allow",
       "Action": [
         "s3:ListBucket"
       ],
       "Resource": [
         "arn:aws:s3:::codepipeline-us-east-2-1234567890"
       ]
     }
   ]
}
```

- 6. Choose **Review policy**.
- 7. In Name, enter a name for this policy. Choose Create policy.
- 8. Create a second policy for Amazon KMS where arn: aws: kms: us-

east-1:012ID_ACCOUNT_A:key/222222-3333333-4444-556677EXAMPLE is the ARN of the customer managed key created in *AccountA* and configured to allow *AccountB* to use it:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
         "Effect": "Allow",
         "Action": [
            "kms:DescribeKey",
            "kms:GenerateDataKey*",
            "kms:Encrypt",
            "kms:ReEncrypt*",
            "kms:Decrypt"
```

```
],
    "Resource": [
    "arn:aws:kms:us-
east-1:012ID_ACCOUNT_A:key/222222-3333333-4444-556677EXAMPLE"
    ]
    ]
    ]
}
```

🛕 Important

You must use the account ID of *AccountA* in this policy as part of the resource ARN for the Amazon KMS key, as shown here, or the policy will not work.

- 9. Choose **Review policy**.
- 10. In Name, enter a name for this policy. Choose Create policy.

Now create an IAM role to use for cross-account access, and configure it so that the CodePipeline service role in *AccountA* can assume the role. This role must contain policies that allow access to the CodeDeploy resources and the Amazon S3 bucket used to store artifacts in *AccountA*.

To configure the cross-account role in IAM

- 1. Sign in to the Amazon Web Services Management Console with *AccountB* and open the IAM console at https://console.amazonaws.cn/iam.
- 2. In the navigation pane, choose **Roles**. Choose **Create role**.
- Under Select type of trusted entity, choose Another Amazon account. Under Specify accounts that can use this role, in Account ID, enter the Amazon account ID for the account that will create the pipeline in CodePipeline (*AccountA*), and then choose Next: Permissions.

🔥 Important

This step creates the trust relationship policy between *AccountB* and *AccountA*. However, this grants root level access to the account, and CodePipeline recommends scoping it down to the CodePipeline service role in *AccountA*. Follow step 16 to restrict permissions.

UnderAttach permissions policies, choose AmazonS3ReadOnlyAccess, and then choose Next: Tags.

🚺 Note

This is not the policy you will use. You must choose a policy to complete the wizard.

- Choose Next: Review. Type a name for this role in Role name (for example, *CrossAccount_Role*). You can name this role anything you want as long as it follows the naming conventions in IAM. Consider giving the role a name that clearly states its purpose. Choose Create Role.
- 6. From the list of roles, choose the role you just created (for example, *CrossAccount_Role*) to open the **Summary** page for that role.
- 7. On the **Permissions** tab, choose **Add inline policy**.
- 8. Choose the **JSON** tab, and enter the following policy to allow access to CodeDeploy resources:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "codedeploy:CreateDeployment",
        "codedeploy:GetDeployment",
        "codedeploy:GetDeploymentConfig",
        "codedeploy:GetApplicationRevision",
        "codedeploy:RegisterApplicationRevision"
      ],
      "Resource": "*"
    }
 ]
}
```

- 9. Choose **Review policy**.
- 10. In Name, enter a name for this policy. Choose Create policy.
- 11. On the **Permissions** tab, choose **Add inline policy**.
- 12. Choose the **JSON** tab, and enter the following policy to allow this role to retrieve input artifacts from, and put output artifacts into, the Amazon S3 bucket in *AccountA*:

User Guide

```
{
   "Version": "2012-10-17",
   "Statement": [
     Ł
       "Effect": "Allow",
       "Action": [
         "s3:GetObject*",
         "s3:PutObject",
         "s3:PutObjectAcl"
       ],
       "Resource": [
         "arn:aws:s3:::codepipeline-us-east-2-1234567890/*"
       ]
     }
   ]
}
```

- 13. Choose Review policy.
- 14. In Name, enter a name for this policy. Choose Create policy.
- 15. On the **Permissions** tab, find **AmazonS3ReadOnlyAccess** in the list of policies under **Policy Name**, and choose the delete icon (X) next to the policy. When prompted, choose **Detach**.
- 16. Select the Trust Relationship tab, and then choose Edit trust policy. Choose the Add a principal option on the left column. For Principal type, choose IAM Roles, and then provide the ARN for the CodePipeline service role in AccountA. Remove arn:aws:iam::Account_A:root from the list for Amazon Principals, and then choose Update policy.

Step 2: Edit the pipeline

You cannot use the CodePipeline console to create or edit a pipeline that uses resources associated with another Amazon account. However, you can use the console to create the general structure of the pipeline, and then use the Amazon CLI to edit the pipeline and add those resources. Alternatively, you can use the structure of an existing pipeline and manually add the resources to it.

To add the resources associated with another Amazon account (Amazon CLI)

1. At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the **get-pipeline** command on the pipeline to which you want to add resources. Copy the command output to

a JSON file. For example, for a pipeline named MyFirstPipeline, you would type something similar to the following:

```
aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json
```

The output is sent to the *pipeline.json* file.

Open the JSON file in any plain-text editor. After "type": "S3" in the artifact store, add the KMS encryptionKey, ID, and type information where codepipeline-us-east-2-1234567890 is the name of the Amazon S3 bucket used to store artifacts for the pipeline and arn:aws:kms:us-east-1:012ID_ACCOUNT_A:key/222222-333333-4444-556677EXAMPLE is the ARN of the customer-managed key you just created:

```
{
    "artifactStore": {
        "location": "codepipeline-us-east-2-1234567890",
        "type": "S3",
        "encryptionKey": {
            "id": "arn:aws:kms:us-
east-1:012ID_ACCOUNT_A:key/222222-3333333-4444-556677EXAMPLE",
            "type": "KMS"
        }
     },
```

3. Add a deploy action in a stage to use the CodeDeploy resources associated with *AccountB*, including the roleArn values for the cross-account role you created (*CrossAccount_Role*).

The following example shows JSON that adds a deploy action named *ExternalDeploy*. It uses the CodeDeploy resources created in *AccountB* in a stage named *Staging*. In the following example, the ARN for *AccountB* is *012ID_ACCOUNT_B*:

```
],
                        "name": "ExternalDeploy",
                        "actionTypeId": {
                            "category": "Deploy",
                            "owner": "AWS",
                            "version": "1",
                            "provider": "CodeDeploy"
                       },
                        "outputArtifacts": [],
                        "configuration": {
                            "ApplicationName": "AccountBApplicationName",
                            "DeploymentGroupName": "AccountBApplicationGroupName"
                       },
                        "runOrder": 1,
                        "roleArn":
"arn:aws:iam::012ID_ACCOUNT_B:role/CrossAccount_Role"
                   }
               ]
           }
```

🚯 Note

This is not the JSON for the entire pipeline, just the structure for the action in a stage.

4. You must remove the metadata lines from the file so the update-pipeline command can use it. Remove the section from the pipeline structure in the JSON file (the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields).

For example, remove the following lines from the structure:

```
"metadata": {
   "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
   "created": "date",
   "updated": "date"
}
```

Save the file.

5. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file, similar to the following:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

To test the pipeline that uses resources associated with another Amazon account

1. At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the **start-pipelineexecution** command, specifying the name of the pipeline, similar to the following:

aws codepipeline start-pipeline-execution --name MyFirstPipeline

For more information, see Start a pipeline manually.

2. Sign in to the Amazon Web Services Management Console with *AccountA* and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed.

- 3. In **Name**, choose the name of the pipeline you just edited. This opens a detailed view of the pipeline, including the state of each action in each stage of the pipeline.
- 4. Watch the progress through the pipeline. Wait for a success message on the action that uses the resource associated with another Amazon account.

Note

You will receive an error if you try to view details for the action while signed in with *AccountA*. Sign out, and then sign in with *AccountB* to view the deployment details in CodeDeploy.

Migrate polling pipelines to use event-based change detection

Amazon CodePipeline supports full, end-to-end continuous delivery, which includes starting your pipeline whenever there is a code change. There are two supported ways to start your pipeline upon a code change: event-based change detection and polling. We recommend using event-based change detection for pipelines.

Use the procedures included here to migrate (update) your polling pipelines to the event-based change detection method for your pipeline.

The recommended event-based change detection method for pipelines is determined by the pipeline source, such as CodeCommit. In that case, for example, the polling pipeline would need to migrate to event-based change detection with EventBridge.

How to migrate polling pipelines

To migrate polling pipelines, determine your polling pipelines and then determine the recommended event-based change detection method:

- Use the steps in <u>Viewing polling pipelines in your account</u> to determine your polling pipelines.
- In the table, find your pipeline source type and then choose the procedure with the implementation you want to use to migrate your polling pipeline. Each section contains multiple methods for migration, such as using the CLI or Amazon CloudFormation.

Pipeline source	Recommended event-based detection method	Migration procedures
Amazon CodeCommit	EventBridge (recommended).	See <u>Migrate polling pipelines with a</u> CodeCommit source.
Amazon S3	EventBridge and bucket enabled for event notifications (recommended).	See <u>Migrate polling pipelines with an</u> S3 source enabled for events.
Amazon S3	EventBridge and an Amazon CloudTrail trail.	See <u>Migrate polling pipelines with an</u> S3 source and CloudTrail trail.

How to migrate pipelines to the recommended change detection method

5	•	
Pipeline source	Recommended event-based detection method	Migration procedures
GitHub (via GitHub App)	Connections (recommended)	See Migrate polling pipelines for a GitHub (via OAuth app) source action to connections.
GitHub (via OAuth app)	Webhooks	See <u>Migrate polling pipelines for a</u> <u>GitHub (via OAuth app) source action</u> <u>to webhooks</u> .

How to migrate pipelines to the recommended change detection method

🔥 Important

For applicable pipeline action configuration updates, such as pipelines with a GitHub (viaOAuth app) action, you must explicitly set the PollForSourceChanges parameter to *false* within your Source action's configuration to stop a pipeline from polling. As a result, it is possible to erroneously configure a pipeline with both event-based change detection *and* polling by, for example, configuring an EventBridge rule and also omitting the PollForSourceChanges parameter. This results in duplicate pipeline executions, and the pipeline is counted toward the limit on total number of polling pipelines, which by default is much lower than event-based pipelines. For more information, see <u>Quotas in Amazon CodePipeline</u>.

Viewing polling pipelines in your account

As a first step, use one of the following scripts to determine which pipelines in your account are configured for polling. These are the pipelines to migrate to event-based change detection.

Viewing polling pipelines in your account (script)

Follow these steps to use a script to determine pipelines in your account that are using polling.

1. Open a terminal window, and then do one of the following:

• Run the following command to create a new script named **PollingPipelinesExtractor.sh**.

```
vi PollingPipelinesExtractor.sh
```

• To use a python script, run the following command to create a new python script named **PollingPipelinesExtractor.py**.

```
vi PollingPipelinesExtractor.py
```

- 2. Copy and paste the following code into the **PollingPipelinesExtractor** script. Do one of the following:
 - Copy and paste the following code into the **PollingPipelinesExtractor.sh** script.

```
#!/bin/bash
set +x
POLLING_PIPELINES=()
LAST_EXECUTED_DATES=( )
NEXT_TOKEN=null
HAS_NEXT_TOKEN=true
if [[ $# -eq 0 ]] ; then
    echo 'Please provide region name'
    exit 0
fi
REGION=$1
while [ "$HAS_NEXT_TOKEN" != "false" ]; do
    if [ "$NEXT_TOKEN" != "null" ];
        then
            LIST_PIPELINES_RESPONSE=$(aws codepipeline list-pipelines --region
 $REGION --next-token $NEXT_TOKEN)
        else
            LIST_PIPELINES_RESPONSE=$(aws codepipeline list-pipelines --region
 $REGION)
    fi
    LIST_PIPELINES=$(jq -r '.pipelines[].name' <<< "$LIST_PIPELINES_RESPONSE")</pre>
    NEXT_TOKEN=$(jq -r '.nextToken' <<< "$LIST_PIPELINES_RESPONSE")</pre>
    if [ "$NEXT_TOKEN" == "null" ];
        then
```

```
HAS_NEXT_TOKEN=false
    fi
    for pipline_name in $LIST_PIPELINES
    do
        PIPELINE=$(aws codepipeline get-pipeline --name $pipline_name --region
 $REGION)
        HAS_POLLABLE_ACTIONS=$(jq '.pipeline.stages[].actions[] |
 select(.actionTypeId.category == "Source") | select(.actionTypeId.owner
 == ("ThirdParty","AWS")) | select(.actionTypeId.provider ==
 ("GitHub", "S3", "CodeCommit")) | select(.configuration.PollForSourceChanges ==
 ("true",null))' <<< "$PIPELINE")</pre>
        if [ ! -z "$HAS_POLLABLE_ACTIONS" ];
        then
            POLLING_PIPELINES+=("$pipline_name")
            PIPELINE_EXECUTIONS=$(aws codepipeline list-pipeline-executions --
pipeline-name $pipline_name --region $REGION)
            LAST_EXECUTION=$(jg -r '.pipelineExecutionSummaries[0]' <<<</pre>
 "$PIPELINE_EXECUTIONS")
            if [ "$LAST_EXECUTION" != "null" ];
                then
                    LAST_EXECUTED_TIMESTAMP=$(jq -r '.startTime' <<<</pre>
 "$LAST_EXECUTION")
                    LAST_EXECUTED_DATE="$(date -r ${LAST_EXECUTED_TIMESTAMP%.*})"
                else
                    LAST_EXECUTED_DATE="Not executed in last year"
            fi
            LAST_EXECUTED_DATES+=("$LAST_EXECUTED_DATE")
        fi
    done
done
fileName=$REGION-$(date +%s)
printf "| %-30s | %-30s |\n" "Polling Pipeline Name" "Last Executed Time"
printf "| %-30s | %-30s |\n" "______"" "_____"" "_____"" "______""
for i in "${!POLLING_PIPELINES[@]}"; do
 printf "| %-30s | %-30s |\n" "${POLLING_PIPELINES[i]}"
 "${LAST_EXECUTED_DATES[i]}"
  printf "${POLLING_PIPELINES[i]}," >> $fileName.csv
done
printf "\nSaving Polling Pipeline Names to file $fileName.csv."
```

• Copy and paste the following code into the PollingPipelinesExtractor.py script.

```
import boto3
import sys
import time
import math
hasNextToken = True
nextToken = ""
pollablePipelines = []
lastExecutedTimes = []
if len(sys.argv) == 1:
    raise Exception("Please provide region name.")
session = boto3.Session(profile_name='default', region_name=sys.argv[1])
codepipeline = session.client('codepipeline')
def is_pollable_action(action):
    actionTypeId = action['actionTypeId']
    configuration = action['configuration']
    return actionTypeId['owner'] in {"AWS", "ThirdParty"}
 and actionTypeId['provider'] in {"GitHub", "CodeCommit",
 "S3"} and ('PollForSourceChanges' not in configuration or
 configuration['PollForSourceChanges'] == 'true')
def has_pollable_actions(pipeline):
    hasPollableAction = False
    pipelineDefinition = codepipeline.get_pipeline(name=pipeline['name'])
['pipeline']
    for action in pipelineDefinition['stages'][0]['actions']:
        hasPollableAction = is_pollable_action(action)
        if hasPollableAction:
            break
    return hasPollableAction
def get_last_executed_time(pipelineName):
 pipelineExecutions=codepipeline.list_pipeline_executions(pipelineName=pipelineName)
['pipelineExecutionSummaries']
    if pipelineExecutions:
        return pipelineExecutions[0]['startTime'].strftime("%A %m/%d/%Y, %H:%M:
%S")
    else:
        return "Not executed in last year"
```

```
while hasNextToken:
    if nextToken=="":
       list_pipelines_response = codepipeline.list_pipelines()
    else:
       list_pipelines_response =
 codepipeline.list_pipelines(nextToken=nextToken)
    if 'nextToken' in list_pipelines_response:
        nextToken = list_pipelines_response['nextToken']
    else:
        hasNextToken= False
    for pipeline in list_pipelines_response['pipelines']:
        if has_pollable_actions(pipeline):
            pollablePipelines.append(pipeline['name'])
            lastExecutedTimes.append(get_last_executed_time(pipeline['name']))
fileName="{region}-
{timeNow}.csv".format(region=sys.argv[1],timeNow=math.trunc(time.time()))
file = open(fileName, 'w')
print ("{:<30} {:<30} {:<30}".format('Polling Pipeline Name', '|','Last Executed</pre>
Time'))
print ("{:<30} {:<30}".format('______</pre>
 '|','____'))
for i in range(len(pollablePipelines)):
    print("{:<30} {:<30} {:<30}".format(pollablePipelines[i], '|',</pre>
 lastExecutedTimes[i]))
   file.write("{pipeline},".format(pipeline=pollablePipelines[i]))
file.close()
print("\nSaving Polling Pipeline Names to file
 {fileName}".format(fileName=fileName))
```

- 3. For each Region where you have pipelines, you must run the script for that Region. To run the script, do one of the following:
 - Run the following command to run the script named **PollingPipelinesExtractor.sh**. In this example, the Region is us-west-2.

```
./PollingPipelinesExtractor.sh us-west-2
```

• For the python script, run the following command to run the python script named**PollingPipelinesExtractor.py**. In this example, the Region is us-west-2.

python3 PollingPipelinesExtractor.py us-west-2

In the following sample output from the script, the Region us-west-2 returned a list of polling pipelines and shows the last execution time for each pipeline.

Analyze the script output and, for each pipeline in the list, update the polling source to the recommended event-based change detection method.

🚯 Note

Your polling pipelines are determined by the pipeline's action configuration for the PollForSourceChanges parameter. If the pipeline source configuration has the PollForSourceChanges parameter ommitted, then CodePipeline defaults to polling your repository for source changes. This behavior is the same as if PollForSourceChanges is included and set to true. For more information, see the configuration parameters for your pipeline's source action, such as the Amazon S3 source action configuration parameters in <u>Amazon S3 source action reference</u>.

Note that this script also generates a .csv file containing the list of polling pipelines in your account and saves the .csv file to the current working folder.

User Guide

Migrate polling pipelines with a CodeCommit source

You can migrate your polling pipeline to use EventBridge to detect changes in your CodeCommit source repository or your Amazon S3 source bucket.

CodeCommit -- For a pipeline with a CodeCommit source, modify the pipeline so that change detection is automated through EventBridge. Choose from the following methods to implement the migration:

- **Console:** Migrate polling pipelines (CodeCommit or Amazon S3 source) (console)
- CLI: Migrate polling pipelines (CodeCommit source) (CLI)
- Amazon CloudFormation: Migrate polling pipelines (CodeCommit source) (Amazon CloudFormation template)

Migrate polling pipelines (CodeCommit or Amazon S3 source) (console)

You can use the CodePipeline console to update your pipeline to use EventBridge to detect changes in your CodeCommit source repository or your Amazon S3 source bucket.

1 Note

When you use the console to edit a pipeline that has a CodeCommit source repository or an Amazon S3 source bucket, the rule and IAM role are created for you. If you use the Amazon CLI to edit the pipeline, you must create the EventBridge rule and IAM role yourself. For more information, see CodeCommit source actions and EventBridge.

Use these steps to edit a pipeline that is using periodic checks. If you want to create a pipeline, see <u>Create a pipeline, stages, and actions</u>.

To edit the pipeline source stage

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed.

2. In **Name**, choose the name of the pipeline you want to edit. This opens a detailed view of the pipeline, including the state of each of the actions in each stage of the pipeline.

- 3. On the pipeline details page, choose **Edit**.
- 4. In **Edit** stage, choose the edit icon on the source action.
- 5. Expand Change Detection Options and choose Use CloudWatch Events to automatically start my pipeline when a change occurs (recommended).

A message appears showing the EventBridge rule to be created for this pipeline. Choose **Update**.

If you are updating a pipeline that has an Amazon S3 source, you see the following message. Choose **Update**.

6. When you have finished editing your pipeline, choose **Save pipeline changes** to return to the summary page.

A message displays the name of the EventBridge rule to be created for your pipeline. Choose **Save and continue**.

7. To test your action, release a change by using the Amazon CLI to commit a change to the source specified in the source stage of the pipeline.

Migrate polling pipelines (CodeCommit source) (CLI)

Follow these steps to edit a pipeline that is using polling (periodic checks) to use an EventBridge rule to start the pipeline. If you want to create a pipeline, see <u>Create a pipeline</u>, stages, and actions.

To build an event-driven pipeline with CodeCommit, you edit the PollForSourceChanges parameter of your pipeline and then create the following resources:

- EventBridge event
- IAM role to allow this event to start your pipeline

To edit your pipeline's PollForSourceChanges parameter

A Important

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling.

Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

1. Run the **get-pipeline** command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

```
aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json
```

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Open the JSON file in any plain-text editor and edit the source stage by changing the PollForSourceChanges parameter to false, as shown in this example.

Why am I making this change? Changing this parameter to false turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "PollForSourceChanges": "false",
    "BranchName": "main",
    "RepositoryName": "MyTestRepo"
},
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
},
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

🛕 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

To create an EventBridge rule with CodeCommit as the event source and CodePipeline as the target

- 1. Add permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see Using resource-based policies for Amazon EventBridge.
 - a. Use the following sample to create the trust policy that allows EventBridge to assume the service role. Name the trust policy trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
        },
        "Action": "sts:AssumeRole"
        }
   ]
}
```

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown in this sample, for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:StartPipelineExecution"
        ],
        "Resource": [
              "arn:aws:codepipeline:us-west-2:80398EXAMPLE:MyFirstPipeline"
        ]
        }
    ]
}
```

d. Use the following command to attach the CodePipeline-Permissions-Policy-for-EB permissions policy to the Role-for-MyRule role.

Why am I making this change? Adding this policy to the role creates permissions for EventBridge.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

2. Call the **put-rule** command and include the --name, --event-pattern, and--role-arn parameters.

Why am I making this change? This command enables Amazon CloudFormation to create the event.

The following sample command creates a rule called MyCodeCommitRepoRule.

```
aws events put-rule --name "MyCodeCommitRepoRule" --event-pattern "{\"source\":
[\"aws.codecommit\"],\"detail-type\":[\"CodeCommit Repository State Change\"],
\"resources\":[\"repository-ARN\"],\"detail\":{\"referenceType\":[\"branch\"],
\"referenceName\":[\"main\"]}}" --role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-for-
MyRule"
```

- 3. To add CodePipeline as a target, call the **put-targets** command and include the following parameters:
 - The --rule parameter is used with the rule_name you created by using **put-rule**.
 - The --targets parameter is used with the list Id of the target in the list of targets and the ARN of the target pipeline.

The following sample command specifies that for the rule called MyCodeCommitRepoRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The sample command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule MyCodeCommitRepoRule --targets
Id=1,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following JSON in your CLI command. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, COMMIT_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
"Arn": "pipeline-ARN",
            "InputTransformer": {
                 "sourceRevisions": {
                     "actionName": "Source",
                     "revisionType": "COMMIT_ID",
                     "revisionValue": "<revisionValue>"
                },
                 "variables": [
                     {
                         "name": "Branch_Name",
                         "value": "value"
                     }
                ]
            }
        }
    ]
}
```

Migrate polling pipelines (CodeCommit source) (Amazon CloudFormation template)

To build an event-driven pipeline with Amazon CodeCommit, you edit the PollForSourceChanges parameter of your pipeline and then add the following resources to your template:

- An EventBridge rule
- An IAM role for your EventBridge rule

If you use Amazon CloudFormation to create and manage your pipelines, your template includes content like the following.

i Note

The Configuration property in the source stage called PollForSourceChanges. If that property isn't included in your template, then PollForSourceChanges is set to true by default.

Resources:

AppPipeline:

Properties:

RoleArn:

Stages:

YAML

```
Type: AWS::CodePipeline::Pipeline
  Name: codecommit-polling-pipeline
    !GetAtt CodePipelineServiceRole.Arn
```

```
Actions:
```

Name: Source

```
Name: SourceAction
ActionTypeId:
  Category: Source
  Owner: AWS
  Version: 1
  Provider: CodeCommit
OutputArtifacts:
  - Name: SourceOutput
Configuration:
  BranchName: !Ref BranchName
  RepositoryName: !Ref RepositoryName
  PollForSourceChanges: true
RunOrder: 1
```

JSON

```
"Stages": [
   {
        "Name": "Source",
 "Actions": [{
      "Name": "SourceAction",
      "ActionTypeId": {
    "Category": "Source",
    "Owner": "AWS",
    "Version": 1,
    "Provider": "CodeCommit"
      },
      "OutputArtifacts": [{
          "Name": "SourceOutput"
```

```
}],
  "Configuration": {
    "BranchName": {
    "Ref": "BranchName"
},
  "RepositoryName": {
    "Ref": "RepositoryName"
},
    "PollForSourceChanges": true
        },
        "RunOrder": 1
        }]
},
```

To update your pipeline Amazon CloudFormation template and create EventBridge rule

- 1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:
 - The first policy allows the role to be assumed.
 - The second policy provides permissions to start the pipeline.

Why am I making this change? Adding the AWS:::IAM::Role resource enables Amazon CloudFormation to create permissions for EventBridge. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRole:

Type: AWS::IAM::Role

Properties:

AssumeRolePolicyDocument:

Version: 2012-10-17

Statement:

-

Effect: Allow

Principal:

Service:

- events.amazonaws.com
```

```
Action: sts:AssumeRole

Path: /

Policies:

-

PolicyName: eb-pipeline-execution

PolicyDocument:

Version: 2012-10-17

Statement:

-

Effect: Allow

Action: codepipeline:StartPipelineExecution

Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref

'AWS::Region', ':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
```

```
JSON
```

```
"EventRole": {
 "Type": "AWS:::IAM::Role",
 "Properties": {
    "AssumeRolePolicyDocument": {
      "Version": "2012-10-17",
      "Statement": [
        {
          "Effect": "Allow",
          "Principal": {
            "Service": [
              "events.amazonaws.com"
            ]
          },
          "Action": "sts:AssumeRole"
        }
      ]
   },
   "Path": "/",
    "Policies": [
      {
        "PolicyName": "eb-pipeline-execution",
        "PolicyDocument": {
          "Version": "2012-10-17",
          "Statement": [
            {
              "Effect": "Allow",
              "Action": "codepipeline:StartPipelineExecution",
```

```
"Resource": {
                 "Fn::Join": [
                    "".
                    Ε
                      "arn:aws:codepipeline:",
                      {
                        "Ref": "AWS::Region"
                      },
                      ":",
                      {
                        "Ref": "AWS::AccountId"
                      },
                      ":",
                      {
                        "Ref": "AppPipeline"
                      }
                    ]
. . .
```

2. In the template, under Resources, use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule. This event pattern creates an event that monitors push changes to your repository. When EventBridge detects a repository state change, the rule invokes StartPipelineExecution on your target pipeline.

Why am I making this change? Adding the AWS::Events::Rule resource enables Amazon CloudFormation to create the event. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRule:
Type: AWS::Events::Rule
Properties:
EventPattern:
source:
- aws.codecommit
detail-type:
- 'CodeCommit Repository State Change'
resources:
- !Join [ '', [ 'arn:aws:codecommit:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref RepositoryName ] ]
detail:
```

JSON

```
"EventRule": {
  "Type": "AWS::Events::Rule",
  "Properties": {
    "EventPattern": {
      "source": [
        "aws.codecommit"
      ],
      "detail-type": [
        "CodeCommit Repository State Change"
      ],
      "resources": [
        {
          "Fn::Join": [
            "",
            Ε
              "arn:aws:codecommit:",
              {
                "Ref": "AWS::Region"
              },
              ":",
              {
                "Ref": "AWS::AccountId"
              },
              ":",
               ſ
```

```
"Ref": "RepositoryName"
          }
        ]
      ]
    }
  ],
  "detail": {
    "event": [
      "referenceCreated",
      "referenceUpdated"
    ],
    "referenceType": [
      "branch"
    ],
    "referenceName": [
      "main"
    ]
  }
},
"Targets": [
  {
    "Arn": {
      "Fn::Join": [
        "",
        Ε
          "arn:aws:codepipeline:",
          {
            "Ref": "AWS::Region"
          },
          ":",
          {
            "Ref": "AWS::AccountId"
          },
          ":",
          {
            "Ref": "AppPipeline"
          }
        ]
      ]
    },
    "RoleArn": {
      "Fn::GetAtt": [
        "EventRole",
        "Arn"
```

```
]
},
"Id": "codepipeline-AppPipeline"
}
]
},
```

- 3. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following YAML snippet. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, COMMIT_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.
 - The output variables for BranchName and Value are specified.

```
Rule: my-rule
Targets:
- Id: MyTargetId
Arn: pipeline-ARN
InputTransformer:
    sourceRevisions:
        actionName: Source
        revisionType: COMMIT_ID
        revisionValue: <revisionValue>
        variables:
        - name: BranchName
        value: value
```

- 4. Save the updated template to your local computer, and then open the Amazon CloudFormation console.
- 5. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 6. Upload the template, and then view the changes listed in Amazon CloudFormation. These are the changes to be made to the stack. You should see your new resources in the list.
- 7. Choose Execute.

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

In many cases, the PollForSourceChanges parameter defaults to true when you create a pipeline. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid settings for the PollForSourceChanges</u> parameter.

In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing this parameter to false turns off periodic checks so you can use event-based change detection only.

YAML

```
Name: Source
Actions:
-
Name: SourceAction
ActionTypeId:
Category: Source
Owner: AWS
Version: 1
Provider: CodeCommit
OutputArtifacts:
- Name: SourceOutput
Configuration:
BranchName: !Ref BranchName
RepositoryName: !Ref RepositoryName
PollForSourceChanges: false
RunOrder: 1
```

JSON

```
{
   "Name": "Source",
   "Actions": [
```

```
{
      "Name": "SourceAction",
      "ActionTypeId": {
        "Category": "Source",
        "Owner": "AWS",
        "Version": 1,
        "Provider": "CodeCommit"
      },
      "OutputArtifacts": [
        {
          "Name": "SourceOutput"
        }
      ],
      "Configuration": {
        "BranchName": {
          "Ref": "BranchName"
        },
        "RepositoryName": {
          "Ref": "RepositoryName"
        },
        "PollForSourceChanges": false
      },
      "RunOrder": 1
    }
 ]
},
```

Example

When you create these resources with Amazon CloudFormation, your pipeline is triggered when files in your repository are created or updated. Here is the final template snippet:

YAML

```
Resources:
EventRole:
Type: AWS::IAM::Role
Properties:
AssumeRolePolicyDocument:
Version: 2012-10-17
Statement:
```

```
Effect: Allow
           Principal:
             Service:
               - events.amazonaws.com
           Action: sts:AssumeRole
     Path: /
     Policies:
         PolicyName: eb-pipeline-execution
         PolicyDocument:
           Version: 2012-10-17
           Statement:
               Effect: Allow
               Action: codepipeline:StartPipelineExecution
               Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region',
':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
EventRule:
  Type: AWS::Events::Rule
  Properties:
     EventPattern:
       source:
         - aws.codecommit
       detail-type:
         - 'CodeCommit Repository State Change'
       resources:
         - !Join [ '', [ 'arn:aws:codecommit:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref RepositoryName ] ]
       detail:
         event:
           - referenceCreated
           - referenceUpdated
         referenceType:
           - branch
         referenceName:
           - main
    Targets:
         Arn:
           !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref AppPipeline ] ]
         RoleArn: !GetAtt EventRole.Arn
         Id: codepipeline-AppPipeline
```

```
AppPipeline:
 Type: AWS::CodePipeline::Pipeline
  Properties:
    Name: codecommit-events-pipeline
    RoleArn:
      !GetAtt CodePipelineServiceRole.Arn
    Stages:
        Name: Source
        Actions:
          _
            Name: SourceAction
            ActionTypeId:
              Category: Source
              Owner: AWS
              Version: 1
              Provider: CodeCommit
            OutputArtifacts:
              - Name: SourceOutput
            Configuration:
              BranchName: !Ref BranchName
              RepositoryName: !Ref RepositoryName
              PollForSourceChanges: false
            RunOrder: 1
```

JSON

• • •

```
"Resources": {
...
"EventRole": {
    "Type": "AWS::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
            {
                "Effect": "Allow",
                "Principal": {
```



Migrate polling pipelines with a CodeCommit source

```
"EventRule": {
    "Type": "AWS::Events::Rule",
    "Properties": {
        "EventPattern": {
            "source": [
                "aws.codecommit"
            ],
            "detail-type": [
                "CodeCommit Repository State Change"
            ],
            "resources": [
                {
                     "Fn::Join": [
                         "",
                         Ε
                             "arn:aws:codecommit:",
                             {
                                 "Ref": "AWS::Region"
                             },
                             ":",
                             {
                                 "Ref": "AWS::AccountId"
                             },
                             ":",
                             {
                                 "Ref": "RepositoryName"
                             }
                         ]
                    ]
                }
            ],
            "detail": {
                "event": [
                     "referenceCreated",
                    "referenceUpdated"
                ],
                "referenceType": [
                    "branch"
                ],
                "referenceName": [
                    "main"
                ]
            }
        },
```



. . .

```
"Name": "Source",
    "Actions": [
        {
            "Name": "SourceAction",
            "ActionTypeId": {
                 "Category": "Source",
                 "Owner": "AWS",
                 "Version": 1,
                 "Provider": "CodeCommit"
            },
            "OutputArtifacts": [
                {
                     "Name": "SourceOutput"
                 }
            ],
            "Configuration": {
                 "BranchName": {
                     "Ref": "BranchName"
                },
                 "RepositoryName": {
                     "Ref": "RepositoryName"
                },
                 "PollForSourceChanges": false
            },
            "RunOrder": 1
        }
    ]
},
```

Migrate polling pipelines with an S3 source enabled for events

For a pipeline with an Amazon S3 source, modify the pipeline so that change detection is automated through EventBridge and with a source bucket that is enabled for event notifications. This is the recommend method if you are using the CLI or Amazon CloudFormation to migrate your pipeline.

(i) Note

This includes using a bucket that is enabled for event notifications, where you do not need to create a separate CloudTrail trail. If you are using the console, then an event rule and CloudTrail trail are set up for you. For those steps, see <u>Migrate polling pipelines with an S3</u> <u>source and CloudTrail trail</u>.

- CLI: Migrate polling pipelines with an S3 source and CloudTrail trail (CLI)
- Amazon CloudFormation: Migrate polling pipelines with an S3 source and CloudTrail trail (Amazon CloudFormation template)

Migrate polling pipelines with an S3 source enabled for events (CLI)

Follow these steps to edit a pipeline that is using polling (periodic checks) to use an event in EventBridge instead. If you want to create a pipeline, see <u>Create a pipeline</u>, stages, and actions.

To build an event-driven pipeline with Amazon S3, you edit the PollForSourceChanges parameter of your pipeline and then create the following resources:

- EventBridge event rule
- IAM role to allow the EventBridge event to start your pipeline

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. Grant permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see <u>Using resource-based policies for Amazon EventBridge</u>.
 - a. Use the following sample to create the trust policy to allow EventBridge to assume the service role. Name it trustpolicyforEB.json.

```
"Service": "events.amazonaws.com"
},
"Action": "sts:AssumeRole"
}
]
}
```

b. Use the following command to create the Role-for-MyRule role and attach the trust policy.

Why am I making this change? Adding this trust policy to the role creates permissions for EventBridge.

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown here for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:StartPipelineExecution"
        ],
        "Resource": [
              "arn:aws:codepipeline:us-west-2:80398EXAMPLE:MyFirstPipeline"
        ]
        }
    ]
}
```

d. Use the following command to attach the new CodePipeline-Permissions-Policyfor-EB permissions policy to the Role-for-MyRule role you created.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

2. Call the **put-rule** command and include the --name, --event-pattern, and --role-arn parameters.

The following sample command creates a rule named EnabledS3SourceRule.

```
aws events put-rule --name "EnabledS3SourceRule" --event-pattern "{\"source\":
[\"aws.s3\"],\"detail-type\":[\"Object Created\"],\"detail\":{\"bucket\":{\"name\":
[\"amzn-s3-demo-source-bucket\"]}}" --role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-
for-MyRule"
```

3. To add CodePipeline as a target, call the **put-targets** command and include the --rule and --targets parameters.

The following command specifies that for the rule named EnabledS3SourceRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

aws events put-targets --rule EnabledS3SourceRule --targets Id=codepipeline-AppPipeline,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline

To edit your pipeline's PollForSourceChanges parameter

A Important

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

 Run the get-pipeline command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

This command returns nothing, but the file you created should appear in the directory where you ran the command.

 Open the JSON file in any plain-text editor and edit the source stage by changing the PollForSourceChanges parameter for a bucket named amzn-s3-demo-source-bucket to false, as shown in this example.

Why am I making this change? Setting this parameter to false turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "S3Bucket": "amzn-s3-demo-source-bucket",
    "PollForSourceChanges": "false",
    "S3ObjectKey": "index.zip"
},
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, you must remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
},
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

<u> Important</u>

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

Migrate polling pipelines with an S3 source enabled for events (Amazon CloudFormation template)

This procedure is for a pipeline where the source bucket has events enabled.

Use these steps to edit your pipeline with an Amazon S3 source from polling to event-based change detection.

To build an event-driven pipeline with Amazon S3, you edit the PollForSourceChanges parameter of your pipeline and then add the following resources to your template:

• EventBridge rule and IAM role to allow this event to start your pipeline.

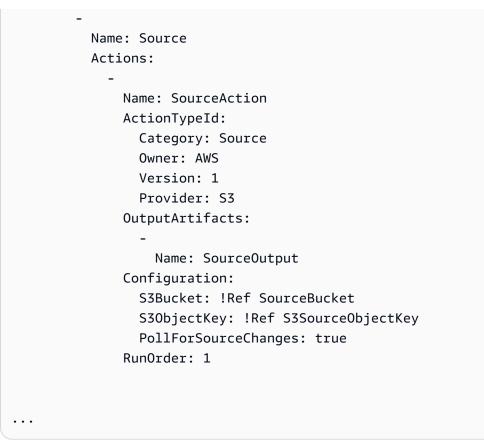
If you use Amazon CloudFormation to create and manage your pipelines, your template includes content like the following.

🚯 Note

The Configuration property in the source stage called PollForSourceChanges. If your template doesn't include that property, then PollForSourceChanges is set to true by default.

YAML

```
AppPipeline:
Type: AWS::CodePipeline::Pipeline
Properties:
    RoleArn: !GetAtt CodePipelineServiceRole.Arn
    Stages:
```



JSON

```
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
    "Properties": {
        "RoleArn": {
            "Fn::GetAtt": ["CodePipelineServiceRole", "Arn"]
        },
        "Stages": [
            {
                "Name": "Source",
                "Actions": [
                    {
                        "Name": "SourceAction",
                         "ActionTypeId": {
                             "Category": "Source",
                             "Owner": "AWS",
                             "Version": 1,
                             "Provider": "S3"
                        },
                         "OutputArtifacts": [
```

```
{
                                           "Name": "SourceOutput"
                                      }
                                  ],
                                  "Configuration": {
                                      "S3Bucket": {
                                           "Ref": "SourceBucket"
                                      },
                                      "S3ObjectKey": {
                                           "Ref": "SourceObjectKey"
                                      },
                                      "PollForSourceChanges": true
                                  },
                                  "RunOrder": 1
                             }
                         ]
                     },
. . .
```

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:
 - The first policy allows the role to be assumed.
 - The second policy provides permissions to start the pipeline.

Why am I making this change? Adding AWS::IAM::Role resource enables Amazon CloudFormation to create permissions for EventBridge. This resource is added to your Amazon CloudFormation stack.

YAML

EventRole: Type: AWS::IAM::Role Properties:



JSON

```
"EventRole": {
  "Type": "AWS::IAM::Role",
  "Properties": {
    "AssumeRolePolicyDocument": {
      "Version": "2012-10-17",
      "Statement": [
        {
          "Effect": "Allow",
          "Principal": {
            "Service": [
              "events.amazonaws.com"
            ]
          },
          "Action": "sts:AssumeRole"
        }
      ]
```

```
},
      "Path": "/",
      "Policies": [
        {
          "PolicyName": "eb-pipeline-execution",
          "PolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
              {
                 "Effect": "Allow",
                 "Action": "codepipeline:StartPipelineExecution",
                 "Resource": {
                   "Fn::Join": [
                     "",
                     Ε
                       "arn:aws:codepipeline:",
                       {
                         "Ref": "AWS::Region"
                       },
                       ":",
                       {
                         "Ref": "AWS::AccountId"
                       },
                       ":",
                       {
                         "Ref": "AppPipeline"
                       }
                     ]
                   ]
. . .
```

2. Use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule. This event pattern creates an event that monitors creation or deletion of objects in your Amazon S3 source bucket. In addition, include a target of your pipeline. When an object is created, this rule invokes StartPipelineExecution on your target pipeline.

Why am I making this change? Adding the AWS::Events::Rule resource enables Amazon CloudFormation to create the event. This resource is added to your Amazon CloudFormation stack.

YAML

EventRule:

Properties:

EventPattern:

Type: AWS::Events::Rule

EventBusName: default

```
source:
         - aws.s3
       detail-type:
         - Object Created
       detail:
         bucket:
           name:
             - !Ref SourceBucket
    Name: EnabledS3SourceRule
    State: ENABLED
    Targets:
       _
         Arn:
           !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref AppPipeline ] ]
         RoleArn: !GetAtt EventRole.Arn
         Id: codepipeline-AppPipeline
```

•••

JSON

```
"EventRule": {
   "Type": "AWS::Events::Rule",
   "Properties": {
   "EventBusName": "default",
   "EventPattern": {
        "source": [
        "aws.s3"
        ],
        "detail-type": [
        "Object Created"
        ],
```

```
"detail": {
    "bucket": {
        "name": [
      "s3-pipeline-source-fra-bucket"
        ]
        }
            }
  },
  "Name": "EnabledS3SourceRule",
        "State": "ENABLED",
        "Targets": [
        {
          "Arn": {
            "Fn::Join": [
              "",
              Ε
                "arn:aws:codepipeline:",
                {
                  "Ref": "AWS::Region"
                },
                ":",
                {
                  "Ref": "AWS::AccountId"
                },
                ":",
                {
                  "Ref": "AppPipeline"
                }
              ]
            ]
          },
          "RoleArn": {
            "Fn::GetAtt": [
              "EventRole",
              "Arn"
            ]
          },
          "Id": "codepipeline-AppPipeline"
        }
      ]
   }
 }
},
```

•••

- 3. Save your updated template to your local computer, and open the Amazon CloudFormation console.
- 4. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 5. Upload your updated template, and then view the changes listed in Amazon CloudFormation. These are the changes that will be made to the stack. You should see your new resources in the list.
- 6. Choose Execute.

To edit your pipeline's PollForSourceChanges parameter

A Important

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing PollForSourceChanges to false turns off periodic checks so you can use event-based change detection only.

YAML

```
Name: Source
Actions:
-
Name: SourceAction
ActionTypeId:
Category: Source
Owner: AWS
Version: 1
Provider: S3
OutputArtifacts:
```

```
    Name: SourceOutput
    Configuration:
    S3Bucket: !Ref SourceBucket
    S3ObjectKey: !Ref SourceObjectKey
    PollForSourceChanges: false
    RunOrder: 1
```

JSON

```
{
   "Name": "SourceAction",
   "ActionTypeId": {
     "Category": "Source",
     "Owner": "AWS",
     "Version": 1,
     "Provider": "S3"
   },
   "OutputArtifacts": [
     {
       "Name": "SourceOutput"
     }
   ],
   "Configuration": {
     "S3Bucket": {
       "Ref": "SourceBucket"
     },
     "S3ObjectKey": {
       "Ref": "SourceObjectKey"
     },
     "PollForSourceChanges": false
   },
   "RunOrder": 1
 }
```

Example

When you use Amazon CloudFormation to create these resources, your pipeline is triggered when files in your repository are created or updated.

(i) Note

Do not stop here. Although your pipeline is created, you must create a second Amazon CloudFormation template for your Amazon S3 pipeline. If you do not create the second template, your pipeline does not have any change detection functionality.

YAML

```
Parameters:
  SourceObjectKey:
    Description: 'S3 source artifact'
    Type: String
    Default: SampleApp_Linux.zip
 ApplicationName:
    Description: 'CodeDeploy application name'
    Type: String
    Default: DemoApplication
  BetaFleet:
    Description: 'Fleet configured in CodeDeploy'
    Type: String
    Default: DemoFleet
Resources:
  SourceBucket:
    Type: AWS::S3::Bucket
    Properties:
      NotificationConfiguration:
        EventBridgeConfiguration:
          EventBridgeEnabled: true
      VersioningConfiguration:
        Status: Enabled
  CodePipelineArtifactStoreBucket:
    Type: AWS::S3::Bucket
  CodePipelineArtifactStoreBucketPolicy:
    Type: AWS::S3::BucketPolicy
    Properties:
      Bucket: !Ref CodePipelineArtifactStoreBucket
      PolicyDocument:
        Version: 2012-10-17
        Statement:
```

```
Sid: DenyUnEncryptedObjectUploads
            Effect: Deny
            Principal: '*'
            Action: s3:PutObject
            Resource: !Join [ '', [ !GetAtt CodePipelineArtifactStoreBucket.Arn, '/
*']]
            Condition:
              StringNotEquals:
                s3:x-amz-server-side-encryption: aws:kms
            Sid: DenyInsecureConnections
            Effect: Deny
            Principal: '*'
            Action: s3:*
            Resource: !Sub ${CodePipelineArtifactStoreBucket.Arn}/*
            Condition:
              Bool:
                aws:SecureTransport: false
  CodePipelineServiceRole:
    Type: AWS::IAM::Role
    Properties:
      AssumeRolePolicyDocument:
        Version: 2012-10-17
        Statement:
            Effect: Allow
            Principal:
              Service:
                - codepipeline.amazonaws.com
            Action: sts:AssumeRole
      Path: /
      Policies:
          PolicyName: AWS-CodePipeline-Service-3
          PolicyDocument:
            Version: 2012-10-17
            Statement:
                Effect: Allow
                Action:
                  - codecommit:CancelUploadArchive
                  - codecommit:GetBranch
                  - codecommit:GetCommit
                  - codecommit:GetUploadArchiveStatus
```

```
- codecommit:UploadArchive
Resource: 'resource_ARN'
Effect: Allow
Action:
  - codedeploy:CreateDeployment
  - codedeploy:GetApplicationRevision
  - codedeploy:GetDeployment
  - codedeploy:GetDeploymentConfig
  - codedeploy:RegisterApplicationRevision
Resource: 'resource_ARN'
Effect: Allow
Action:
  - codebuild:BatchGetBuilds
  - codebuild:StartBuild
Resource: 'resource_ARN'
Effect: Allow
Action:
  - devicefarm:ListProjects
  - devicefarm:ListDevicePools
  - devicefarm:GetRun
  - devicefarm:GetUpload
  - devicefarm:CreateUpload
  - devicefarm:ScheduleRun
Resource: 'resource_ARN'
Effect: Allow
Action:
  - lambda:InvokeFunction
  - lambda:ListFunctions
Resource: 'resource_ARN'
Effect: Allow
Action:
  - iam:PassRole
Resource: 'resource_ARN'
Effect: Allow
Action:
  - elasticbeanstalk:*
  - ec2:*
  - elasticloadbalancing:*
```

```
- autoscaling:*
                - cloudwatch:*
                - s3:*
                - sns:*
                - cloudformation:*
                - rds:*
                - sqs:*
                - ecs:*
              Resource: 'resource_ARN'
AppPipeline:
  Type: AWS::CodePipeline::Pipeline
  Properties:
    Name: s3-events-pipeline
    RoleArn:
      !GetAtt CodePipelineServiceRole.Arn
    Stages:
        Name: Source
        Actions:
            Name: SourceAction
            ActionTypeId:
              Category: Source
              Owner: AWS
              Version: 1
              Provider: S3
            OutputArtifacts:
              - Name: SourceOutput
            Configuration:
              S3Bucket: !Ref SourceBucket
              S3ObjectKey: !Ref SourceObjectKey
              PollForSourceChanges: false
            RunOrder: 1
        Name: Beta
        Actions:
            Name: BetaAction
            InputArtifacts:
              - Name: SourceOutput
            ActionTypeId:
              Category: Deploy
              Owner: AWS
              Version: 1
```

```
Provider: CodeDeploy
             Configuration:
               ApplicationName: !Ref ApplicationName
               DeploymentGroupName: !Ref BetaFleet
             RunOrder: 1
    ArtifactStore:
       Type: S3
       Location: !Ref CodePipelineArtifactStoreBucket
 EventRole:
  Type: AWS::IAM::Role
  Properties:
    AssumeRolePolicyDocument:
       Version: 2012-10-17
       Statement:
           Effect: Allow
           Principal:
             Service:
               - events.amazonaws.com
           Action: sts:AssumeRole
     Path: /
     Policies:
         PolicyName: eb-pipeline-execution
         PolicyDocument:
           Version: 2012-10-17
           Statement:
               Effect: Allow
               Action: codepipeline:StartPipelineExecution
               Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region',
':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
EventRule:
  Type: AWS::Events::Rule
  Properties:
     EventBusName: default
     EventPattern:
       source:
         - aws.s3
       detail-type:
         - Object Created
       detail:
         bucket:
           name:
```

JSON

```
{
    "Parameters": {
        "SourceObjectKey": {
            "Description": "S3 source artifact",
            "Type": "String",
            "Default": "SampleApp_Linux.zip"
        },
        "ApplicationName": {
            "Description": "CodeDeploy application name",
            "Type": "String",
            "Default": "DemoApplication"
        },
        "BetaFleet": {
            "Description": "Fleet configured in CodeDeploy",
            "Type": "String",
            "Default": "DemoFleet"
        }
    },
    "Resources": {
        "SourceBucket": {
            "Type": "AWS::S3::Bucket",
              "Properties": {
                "NotificationConfiguration": {
                    "EventBridgeConfiguration": {
                         "EventBridgeEnabled": true
                    }
                },
                "VersioningConfiguration": {
                     "Status": "Enabled"
```

},

},

```
}
    }
"CodePipelineArtifactStoreBucket": {
    "Type": "AWS::S3::Bucket"
"CodePipelineArtifactStoreBucketPolicy": {
    "Type": "AWS::S3::BucketPolicy",
    "Properties": {
        "Bucket": {
            "Ref": "CodePipelineArtifactStoreBucket"
        },
        "PolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                {
                    "Sid": "DenyUnEncryptedObjectUploads",
                    "Effect": "Deny",
                    "Principal": "*",
                    "Action": "s3:PutObject",
                    "Resource": {
                         "Fn::Join": [
                             "",
                             Ε
                                 {
                                     "Fn::GetAtt": [
                                         "CodePipelineArtifactStoreBucket",
                                         "Arn"
                                     ]
                                 },
                                 "/*"
                             ]
                        ]
                    },
                    "Condition": {
                         "StringNotEquals": {
                             "s3:x-amz-server-side-encryption": "aws:kms"
                         }
                    }
                },
                {
                    "Sid": "DenyInsecureConnections",
                    "Effect": "Deny",
                    "Principal": "*",
```



{

```
"PolicyName": "AWS-CodePipeline-Service-3",
"PolicyDocument": {
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "codecommit:CancelUploadArchive",
                "codecommit:GetBranch",
                "codecommit:GetCommit",
                "codecommit:GetUploadArchiveStatus",
                "codecommit:UploadArchive"
            ],
            "Resource": "resource_ARN"
        },
        {
            "Effect": "Allow",
            "Action": [
                "codedeploy:CreateDeployment",
                "codedeploy:GetApplicationRevision",
                "codedeploy:GetDeployment",
                "codedeploy:GetDeploymentConfig",
                "codedeploy:RegisterApplicationRevision"
            ],
            "Resource": "resource_ARN"
        },
        {
            "Effect": "Allow",
            "Action": [
                "codebuild:BatchGetBuilds",
                "codebuild:StartBuild"
            ],
            "Resource": "resource_ARN"
        },
        {
            "Effect": "Allow",
            "Action": [
                "devicefarm:ListProjects",
                "devicefarm:ListDevicePools",
                "devicefarm:GetRun",
                "devicefarm:GetUpload",
                "devicefarm:CreateUpload",
                "devicefarm:ScheduleRun"
```

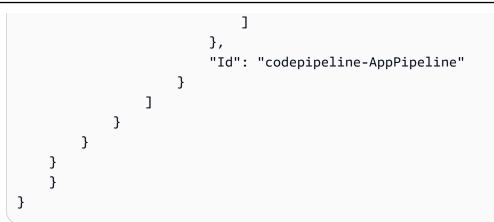
```
],
                             "Resource": "resource_ARN"
                         },
                         {
                             "Effect": "Allow",
                             "Action": [
                                 "lambda:InvokeFunction",
                                 "lambda:ListFunctions"
                             ],
                             "Resource": "resource_ARN"
                         },
                         {
                             "Effect": "Allow",
                             "Action": [
                                 "iam:PassRole"
                             ],
                             "Resource": "resource_ARN"
                         },
                         {
                             "Effect": "Allow",
                             "Action": [
                                 "elasticbeanstalk:*",
                                 "ec2:*",
                                 "elasticloadbalancing:*",
                                 "autoscaling:*",
                                 "cloudwatch:*",
                                 "s3:*",
                                 "sns:*",
                                 "cloudformation:*",
                                 "rds:*",
                                 "sqs:*",
                                 "ecs:*"
                             ],
                             "Resource": "resource_ARN"
                         }
                     ]
                }
            }
        ]
    }
},
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
    "Properties": {
```

```
"Name": "s3-events-pipeline",
"RoleArn": {
    "Fn::GetAtt": [
        "CodePipelineServiceRole",
        "Arn"
    ]
},
"Stages": [
    {
        "Name": "Source",
        "Actions": [
            {
                "Name": "SourceAction",
                "ActionTypeId": {
                     "Category": "Source",
                     "Owner": "AWS",
                     "Version": 1,
                     "Provider": "S3"
                },
                "OutputArtifacts": [
                     {
                         "Name": "SourceOutput"
                     }
                ],
                "Configuration": {
                     "S3Bucket": {
                         "Ref": "SourceBucket"
                     },
                     "S3ObjectKey": {
                         "Ref": "SourceObjectKey"
                     },
                     "PollForSourceChanges": false
                },
                "RunOrder": 1
            }
        ]
    },
    {
        "Name": "Beta",
        "Actions": [
            {
                "Name": "BetaAction",
                "InputArtifacts": [
                     {
```

```
"Name": "SourceOutput"
                             }
                         ],
                         "ActionTypeId": {
                             "Category": "Deploy",
                             "Owner": "AWS",
                             "Version": 1,
                             "Provider": "CodeDeploy"
                         },
                         "Configuration": {
                             "ApplicationName": {
                                 "Ref": "ApplicationName"
                             },
                             "DeploymentGroupName": {
                                 "Ref": "BetaFleet"
                             }
                         },
                         "RunOrder": 1
                    }
                ]
            }
        ],
        "ArtifactStore": {
            "Type": "S3",
            "Location": {
                 "Ref": "CodePipelineArtifactStoreBucket"
            }
        }
    }
},
"EventRole": {
    "Type": "AWS:::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                 {
                     "Effect": "Allow",
                     "Principal": {
                         "Service": [
                             "events.amazonaws.com"
                         ]
                    },
                     "Action": "sts:AssumeRole"
```

```
}
            ]
        },
        "Path": "/",
        "Policies": [
            {
                 "PolicyName": "eb-pipeline-execution",
                 "PolicyDocument": {
                     "Version": "2012-10-17",
                     "Statement": [
                         {
                             "Effect": "Allow",
                             "Action": "codepipeline:StartPipelineExecution",
                             "Resource": {
                                 "Fn::Join": [
                                     "",
                                      Ε
                                          "arn:aws:codepipeline:",
                                          {
                                              "Ref": "AWS::Region"
                                          },
                                          ":",
                                          {
                                              "Ref": "AWS::AccountId"
                                          },
                                          ":",
                                          {
                                              "Ref": "AppPipeline"
                                          }
                                      ]
                                 ]
                             }
                         }
                     ]
                }
            }
        ]
    }
},
"EventRule": {
    "Type": "AWS::Events::Rule",
    "Properties": {
        "EventBusName": "default",
```

```
"EventPattern": {
            "source": [
          "aws.s3"
        ],
              "detail-type": [
      "Object Created"
        ],
        "detail": {
      "bucket": {
                        "name": [
                            {
                            "Ref": "SourceBucket"
                            }
                        ]
                    }
             }
},
"Name": "EnabledS3SourceRule",
      "State": "ENABLED",
              "Targets": [
                  {
                       "Arn": {
                           "Fn::Join": [
                               "",
                               Ε
                                    "arn:aws:codepipeline:",
                                    {
                                        "Ref": "AWS::Region"
                                    },
                                   ":",
                                    {
                                       "Ref": "AWS::AccountId"
                                    },
                                    ":",
                                    {
                                        "Ref": "AppPipeline"
                                    }
                               ]
                           ]
                       },
                       "RoleArn": {
                           "Fn::GetAtt": [
                               "EventRole",
                               "Arn"
```



Migrate polling pipelines with an S3 source and CloudTrail trail

For a pipeline with an Amazon S3 source, modify the pipeline so that change detection is automated through EventBridge. Choose from the following methods to implement the migration:

- **Console:** Migrate polling pipelines (CodeCommit or Amazon S3 source) (console)
- CLI: Migrate polling pipelines with an S3 source and CloudTrail trail (CLI)
- Amazon CloudFormation: Migrate polling pipelines with an S3 source and CloudTrail trail (Amazon CloudFormation template)

Migrate polling pipelines with an S3 source and CloudTrail trail (CLI)

Follow these steps to edit a pipeline that is using polling (periodic checks) to use an event in EventBridge instead. If you want to create a pipeline, see <u>Create a pipeline, stages, and actions</u>.

To build an event-driven pipeline with Amazon S3, you edit the PollForSourceChanges parameter of your pipeline and then create the following resources:

- Amazon CloudTrail trail, bucket, and bucket policy that Amazon S3 can use to log the events.
- EventBridge event
- IAM role to allow the EventBridge event to start your pipeline

To create an Amazon CloudTrail trail and enable logging

To use the Amazon CLI to create a trail, call the **create-trail** command, specifying:

• The trail name.

• The bucket to which you have already applied the bucket policy for Amazon CloudTrail.

For more information, see Creating a trail with the Amazon command line interface.

1. Call the **create-trail** command and include the --name and --s3-bucket-name parameters.

Why am I making this change? This creates the CloudTrail trail required for your S3 source bucket.

The following command uses --name and --s3-bucket-name to create a trail named mytrail and a bucket named amzn-s3-demo-source-bucket.

```
aws cloudtrail create-trail --name my-trail --s3-bucket-name amzn-s3-demo-source-
bucket
```

2. Call the **start-logging** command and include the --name parameter.

Why am I making this change? This command starts the CloudTrail logging for your source bucket and sends events to EventBridge.

Example:

The following command uses --name to start logging on a trail named my-trail.

aws cloudtrail start-logging --name my-trail

3. Call the **put-event-selectors** command and include the --trail-name and --eventselectors parameters. Use event selectors to specify that you want your trail to log data events for your source bucket and send the events to the EventBridge rule.

Why am I making this change? This command filters events.

Example:

The following command uses --trail-name and --event-selectors to specify data events for a source bucket and prefix named amzn-s3-demo-source-bucket/myFolder.

```
aws cloudtrail put-event-selectors --trail-name my-trail --event-selectors
    '[{ "ReadWriteType": "WriteOnly", "IncludeManagementEvents":false,
```

```
User Guide
```

```
"DataResources": [{ "Type": "AWS::S3::Object", "Values": ["arn:aws:s3:::amzn-s3-
demo-source-bucket/myFolder/file.zip"] }] }]'
```

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. Grant permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see Using resource-based policies for Amazon EventBridge.
 - a. Use the following sample to create the trust policy to allow EventBridge to assume the service role. Name it trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
        },
        "Action": "sts:AssumeRole"
        }
   ]
}
```

b. Use the following command to create the Role-for-MyRule role and attach the trust policy.

Why am I making this change? Adding this trust policy to the role creates permissions for EventBridge.

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown here for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
```

```
"Effect": "Allow",
    "Action": [
        "codepipeline:StartPipelineExecution"
    ],
    "Resource": [
        "arn:aws:codepipeline:us-west-2:80398EXAMPLE:MyFirstPipeline"
    ]
    }
}
```

d. Use the following command to attach the new CodePipeline-Permissions-Policyfor-EB permissions policy to the Role-for-MyRule role you created.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

 Call the put-rule command and include the --name, --event-pattern, and --role-arn parameters.

The following sample command creates a rule named MyS3SourceRule.

```
aws events put-rule --name "MyS3SourceRule" --event-pattern "{\"source\":
[\"aws.s3\"],\"detail-type\":[\"AWS API Call via CloudTrail\"],\"detail\":
{\"eventSource\":[\"s3.amazonaws.com\"],\"eventName\":[\"CopyObject\",\"PutObject
\",\"CompleteMultipartUpload\"],\"requestParameters\":{\"bucketName\":[\"amzn-s3-
demo-source-bucket\"],\"key\":[\"my-key\"]}}
--role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-for-MyRule"
```

3. To add CodePipeline as a target, call the **put-targets** command and include the --rule and --targets parameters.

The following command specifies that for the rule named MyS3SourceRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule MyS3SourceRule --targets
Id=1,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following JSON in your CLI command. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, S3_OBJECT_VERSION_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
{
    "Rule": "my-rule",
    "Targets": [
        {
            "Id": "MyTargetId",
            "Arn": "ARN",
            "InputTransformer": {
                "InputPathsMap": {
                     "revisionValue": "$.detail.object.version-id"
                },
                "InputTemplate": {
                     "sourceRevisions": {
                         "actionName": "Source",
                         "revisionType": "S3_OBJECT_VERSION_ID",
                         "revisionValue": "<revisionValue>"
                     }
                }
            }
        }
    ]
}
```

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change

detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

1. Run the **get-pipeline** command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

```
aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json
```

This command returns nothing, but the file you created should appear in the directory where you ran the command.

 Open the JSON file in any plain-text editor and edit the source stage by changing the PollForSourceChanges parameter for a bucket named amzn-s3-demo-source-bucket to false, as shown in this example.

Why am I making this change? Setting this parameter to false turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "S3Bucket": "amzn-s3-demo-source-bucket",
    "PollForSourceChanges": "false",
    "S3ObjectKey": "index.zip"
},
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, you must remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
},
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

Migrate polling pipelines with an S3 source and CloudTrail trail (Amazon CloudFormation template)

Use these steps to edit your pipeline with an Amazon S3 source from polling to event-based change detection.

To build an event-driven pipeline with Amazon S3, you edit the PollForSourceChanges parameter of your pipeline and then add the following resources to your template:

- EventBridge requires that all Amazon S3 events must be logged. You must create an Amazon CloudTrail trail, bucket, and bucket policy that Amazon S3 can use to log the events that occur. For more information, see <u>Logging data events for trails</u> and <u>Logging management events for</u> <u>trails</u>.
- EventBridge rule and IAM role to allow this event to start our pipeline.

If you use Amazon CloudFormation to create and manage your pipelines, your template includes content like the following.

(i) Note

The Configuration property in the source stage called PollForSourceChanges. If your template doesn't include that property, then PollForSourceChanges is set to true by default.

YAML

```
AppPipeline:
  Type: AWS::CodePipeline::Pipeline
  Properties:
    RoleArn: !GetAtt CodePipelineServiceRole.Arn
    Stages:
        Name: Source
        Actions:
            Name: SourceAction
            ActionTypeId:
              Category: Source
              Owner: AWS
              Version: 1
              Provider: S3
            OutputArtifacts:
                Name: SourceOutput
            Configuration:
              S3Bucket: !Ref SourceBucket
              S3ObjectKey: !Ref S3SourceObjectKey
              PollForSourceChanges: true
            RunOrder: 1
```

JSON

. . .

```
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
    "Properties": {
        "RoleArn": {
```

```
"Fn::GetAtt": ["CodePipelineServiceRole", "Arn"]
                },
                "Stages": [
                    {
                         "Name": "Source",
                         "Actions": [
                             {
                                 "Name": "SourceAction",
                                 "ActionTypeId": {
                                      "Category": "Source",
                                      "Owner": "AWS",
                                      "Version": 1,
                                      "Provider": "S3"
                                 },
                                 "OutputArtifacts": [
                                     {
                                          "Name": "SourceOutput"
                                     }
                                 ],
                                 "Configuration": {
                                      "S3Bucket": {
                                          "Ref": "SourceBucket"
                                     },
                                      "S3ObjectKey": {
                                          "Ref": "SourceObjectKey"
                                     },
                                      "PollForSourceChanges": true
                                 },
                                 "RunOrder": 1
                             }
                         ]
                    },
. . .
```

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:

- The first policy allows the role to be assumed.
- The second policy provides permissions to start the pipeline.

Why am I making this change? Adding AWS:::IAM::Role resource enables Amazon CloudFormation to create permissions for EventBridge. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRole:
   Type: AWS::IAM::Role
    Properties:
     AssumeRolePolicyDocument:
        Version: 2012-10-17
        Statement:
            Effect: Allow
            Principal:
              Service:
                - events.amazonaws.com
            Action: sts:AssumeRole
     Path: /
     Policies:
          PolicyName: eb-pipeline-execution
          PolicyDocument:
            Version: 2012-10-17
            Statement:
                Effect: Allow
                Action: codepipeline:StartPipelineExecution
                Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref
'AWS::Region', ':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
. . .
```

JSON

"EventRole": {

```
"Type": "AWS:::IAM::Role",
"Properties": {
  "AssumeRolePolicyDocument": {
    "Version": "2012-10-17",
    "Statement": [
      {
        "Effect": "Allow",
        "Principal": {
          "Service": [
            "events.amazonaws.com"
          ]
        },
        "Action": "sts:AssumeRole"
      }
   ]
  },
  "Path": "/",
  "Policies": [
    {
      "PolicyName": "eb-pipeline-execution",
      "PolicyDocument": {
        "Version": "2012-10-17",
        "Statement": [
          {
            "Effect": "Allow",
            "Action": "codepipeline:StartPipelineExecution",
            "Resource": {
              "Fn::Join": [
                "",
                Γ
                  "arn:aws:codepipeline:",
                  {
                    "Ref": "AWS::Region"
                  },
                  ":",
                  {
                    "Ref": "AWS::AccountId"
                  },
                  ":",
                  {
                    "Ref": "AppPipeline"
                  }
                ]
              ]
```

•••

2. Use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule. This event pattern creates an event that monitors CopyObject, PutObject and CompleteMultipartUpload on your Amazon S3 source bucket. In addition, include a target of your pipeline. When CopyObject, PutObject, or CompleteMultipartUpload occurs, this rule invokes StartPipelineExecution on your target pipeline.

Why am I making this change? Adding the AWS::Events::Rule resource enables Amazon CloudFormation to create the event. This resource is added to your Amazon CloudFormation stack.

```
EventRule:
  Type: AWS::Events::Rule
  Properties:
    EventPattern:
       source:
         - aws.s3
       detail-type:
         - 'AWS API Call via CloudTrail'
       detail:
         eventSource:
           - s3.amazonaws.com
         eventName:
           - CopyObject
           - PutObject
           - CompleteMultipartUpload
         requestParameters:
           bucketName:
             - !Ref SourceBucket
           key:
             - !Ref SourceObjectKey
    Targets:
         Arn:
           !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref AppPipeline ] ]
         RoleArn: !GetAtt EventRole.Arn
         Id: codepipeline-AppPipeline
```

•••

JSON

```
"EventRule": {
  "Type": "AWS::Events::Rule",
  "Properties": {
    "EventPattern": {
      "source": [
        "aws.s3"
      ],
      "detail-type": [
        "AWS API Call via CloudTrail"
      ],
      "detail": {
        "eventSource": [
          "s3.amazonaws.com"
        ],
        "eventName": [
          "CopyObject",
          "PutObject",
          "CompleteMultipartUpload"
        ],
        "requestParameters": {
          "bucketName": [
            {
              "Ref": "SourceBucket"
            }
          ],
          "key": [
            {
              "Ref": "SourceObjectKey"
            }
          ]
        }
      }
    },
    "Targets": [
      {
        "Arn": {
```



3. Add this snippet to your first template to allow cross-stack functionality:

```
Outputs:
SourceBucketARN:
Description: "S3 bucket ARN that Cloudtrail will use"
Value: !GetAtt SourceBucket.Arn
Export:
Name: SourceBucketARN
```

JSON

```
"Outputs" : {
    "SourceBucketARN" : {
        "Description" : "S3 bucket ARN that Cloudtrail will use",
        "Value" : { "Fn::GetAtt": ["SourceBucket", "Arn"] },
        "Export" : {
            "Name" : "SourceBucketARN"
        }
    }
....
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following YAML snippet. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, S3_OBJECT_VERSION_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
---
Rule: my-rule
Targets:
- Id: MyTargetId
Arn: pipeline-ARN
InputTransformer:
InputPathsMap:
revisionValue: "$.detail.object.version-id"
InputTemplate:
sourceRevisions:
actionName: Source
revisionType: S3_OBJECT_VERSION_ID
revisionValue: '<revisionValue>'
```

5. Save your updated template to your local computer, and open the Amazon CloudFormation console.

- 6. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 7. Upload your updated template, and then view the changes listed in Amazon CloudFormation. These are the changes that will be made to the stack. You should see your new resources in the list.
- 8. Choose **Execute**.

To edit your pipeline's PollForSourceChanges parameter

🔥 Important

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing PollForSourceChanges to false turns off periodic checks so you can use event-based change detection only.

Name: Source
Actions:
-
Name: SourceAction
ActionTypeId:
Category: Source
Owner: AWS
Version: 1
Provider: S3
OutputArtifacts:
- Name: SourceOutput
Configuration:
S3Bucket: !Ref SourceBucket
S3ObjectKey: !Ref SourceObjectKey

PollForSourceChanges: false RunOrder: 1

JSON

```
{
   "Name": "SourceAction",
   "ActionTypeId": {
     "Category": "Source",
     "Owner": "AWS",
     "Version": 1,
     "Provider": "S3"
   },
   "OutputArtifacts": [
     {
       "Name": "SourceOutput"
     }
   ],
   "Configuration": {
     "S3Bucket": {
       "Ref": "SourceBucket"
     },
     "S3ObjectKey": {
       "Ref": "SourceObjectKey"
     },
     "PollForSourceChanges": false
   },
   "RunOrder": 1
 }
```

To create a second template for your Amazon S3 pipeline's CloudTrail resources

 In a separate template, under Resources, use the AWS::S3::Bucket, AWS::S3::BucketPolicy, and AWS::CloudTrail::Trail Amazon CloudFormation resources to provide a simple bucket definition and trail for CloudTrail.

Why am I making this change? Given the current limit of five trails per account, the CloudTrail trail must be created and managed separately. (See <u>Limits in Amazon CloudTrail</u>.) However, you can include many Amazon S3 buckets on a single trail, so you can create the trail

once and then add Amazon S3 buckets for other pipelines as necessary. Paste the following into your second sample template file.

```
# Prerequisites:
 - S3 SourceBucket and SourceObjectKey must exist
#
Parameters:
 SourceObjectKey:
   Description: 'S3 source artifact'
   Type: String
   Default: SampleApp_Linux.zip
Resources:
 AWSCloudTrailBucketPolicy:
   Type: AWS::S3::BucketPolicy
   Properties:
     Bucket: !Ref AWSCloudTrailBucket
    PolicyDocument:
      Version: 2012-10-17
      Statement:
         Sid: AWSCloudTrailAclCheck
         Effect: Allow
         Principal:
           Service:
             - cloudtrail.amazonaws.com
         Action: s3:GetBucketAcl
         Resource: !GetAtt AWSCloudTrailBucket.Arn
         Sid: AWSCloudTrailWrite
         Effect: Allow
         Principal:
           Service:
             - cloudtrail.amazonaws.com
         Action: s3:PutObject
         Resource: !Join [ '', [ !GetAtt AWSCloudTrailBucket.Arn, '/
AWSLogs/', !Ref 'AWS::AccountId', '/*' ] ]
         Condition:
           StringEquals:
```

```
s3:x-amz-acl: bucket-owner-full-control
 AWSCloudTrailBucket:
   Type: AWS::S3::Bucket
   DeletionPolicy: Retain
 AwsCloudTrail:
   DependsOn:
      - AWSCloudTrailBucketPolicy
   Type: AWS::CloudTrail::Trail
   Properties:
     S3BucketName: !Ref AWSCloudTrailBucket
     EventSelectors:
          DataResources:
              Type: AWS::S3::Object
              Values:
                - !Join [ '', [ !ImportValue SourceBucketARN, '/', !Ref
SourceObjectKey ] ]
          ReadWriteType: WriteOnly
          IncludeManagementEvents: false
     IncludeGlobalServiceEvents: true
     IsLogging: true
     IsMultiRegionTrail: true
. . .
```

JSON

```
{
    "Parameters": {
        "SourceObjectKey": {
            "Description": "S3 source artifact",
            "Type": "String",
            "Default": "SampleApp_Linux.zip"
        }
    },
    "Resources": {
        "AWSCloudTrailBucket": {
            "Type": "AWS::S3::Bucket",
            "DeletionPolicy": "Retain"
        },
        "AWSCloudTrailBucketPolicy": {
            "AUSCloudTrailBucketPolicy": {
            "AWSCloudTrailBucketPolicy": {
            "AUSCloudTrailBucketPolicy": {
            "AUSCloudTrailBucketPol
```

```
"Type": "AWS::S3::BucketPolicy",
"Properties": {
 "Bucket": {
    "Ref": "AWSCloudTrailBucket"
 },
 "PolicyDocument": {
    "Version": "2012-10-17",
    "Statement": [
      {
        "Sid": "AWSCloudTrailAclCheck",
        "Effect": "Allow",
        "Principal": {
          "Service": [
            "cloudtrail.amazonaws.com"
          ]
        },
        "Action": "s3:GetBucketAcl",
        "Resource": {
          "Fn::GetAtt": [
            "AWSCloudTrailBucket",
            "Arn"
          ]
        }
      },
      {
        "Sid": "AWSCloudTrailWrite",
        "Effect": "Allow",
        "Principal": {
          "Service": [
            "cloudtrail.amazonaws.com"
          ]
        },
        "Action": "s3:PutObject",
        "Resource": {
          "Fn::Join": [
            "",
            Ε
              {
                "Fn::GetAtt": [
                  "AWSCloudTrailBucket",
                  "Arn"
                ]
              },
              "/AWSLogs/",
```

```
{
                   "Ref": "AWS::AccountId"
                },
                 "/*"
              ]
            ]
          },
          "Condition": {
            "StringEquals": {
              "s3:x-amz-acl": "bucket-owner-full-control"
            }
          }
        }
      ]
    }
  }
},
"AwsCloudTrail": {
  "DependsOn": [
    "AWSCloudTrailBucketPolicy"
  ],
  "Type": "AWS::CloudTrail::Trail",
  "Properties": {
    "S3BucketName": {
      "Ref": "AWSCloudTrailBucket"
    },
    "EventSelectors": [
      {
        "DataResources": [
          {
            "Type": "AWS::S3::Object",
            "Values": [
              {
                 "Fn::Join": [
                   "",
                   Ε
                     {
                       "Fn::ImportValue": "SourceBucketARN"
                     },
                     "/",
                     {
                       "Ref": "SourceObjectKey"
                     }
                   ]
```

```
]
                   }
                 ]
               }
             ],
             "ReadWriteType": "WriteOnly",
             "IncludeManagementEvents": false
          }
        ],
        "IncludeGlobalServiceEvents": true,
        "IsLogging": true,
        "IsMultiRegionTrail": true
      }
    }
  }
}
. . .
```

Example

When you use Amazon CloudFormation to create these resources, your pipeline is triggered when files in your repository are created or updated.

Note

Do not stop here. Although your pipeline is created, you must create a second Amazon CloudFormation template for your Amazon S3 pipeline. If you do not create the second template, your pipeline does not have any change detection functionality.

```
Resources:
SourceBucket:
Type: AWS::S3::Bucket
Properties:
VersioningConfiguration:
Status: Enabled
CodePipelineArtifactStoreBucket:
Type: AWS::S3::Bucket
```

```
CodePipelineArtifactStoreBucketPolicy:
    Type: AWS::S3::BucketPolicy
    Properties:
      Bucket: !Ref CodePipelineArtifactStoreBucket
      PolicyDocument:
        Version: 2012-10-17
        Statement:
            Sid: DenyUnEncryptedObjectUploads
            Effect: Deny
            Principal: '*'
            Action: s3:PutObject
            Resource: !Join [ '', [ !GetAtt CodePipelineArtifactStoreBucket.Arn, '/
*']]
            Condition:
              StringNotEquals:
                s3:x-amz-server-side-encryption: aws:kms
            Sid: DenyInsecureConnections
            Effect: Deny
            Principal: '*'
            Action: s3:*
            Resource: !Join [ '', [ !GetAtt CodePipelineArtifactStoreBucket.Arn, '/
*']]
            Condition:
              Bool:
                aws:SecureTransport: false
  CodePipelineServiceRole:
    Type: AWS::IAM::Role
    Properties:
      AssumeRolePolicyDocument:
        Version: 2012-10-17
        Statement:
            Effect: Allow
            Principal:
              Service:
                - codepipeline.amazonaws.com
            Action: sts:AssumeRole
      Path: /
      Policies:
          PolicyName: AWS-CodePipeline-Service-3
          PolicyDocument:
```

```
Version: 2012-10-17
Statement:
    Effect: Allow
    Action:
      - codecommit:CancelUploadArchive
      - codecommit:GetBranch
      - codecommit:GetCommit
      - codecommit:GetUploadArchiveStatus
      - codecommit:UploadArchive
    Resource: 'resource_ARN'
    Effect: Allow
    Action:
      - codedeploy:CreateDeployment
      - codedeploy:GetApplicationRevision
      - codedeploy:GetDeployment
      - codedeploy:GetDeploymentConfig
      - codedeploy:RegisterApplicationRevision
    Resource: 'resource_ARN'
    Effect: Allow
    Action:

    codebuild:BatchGetBuilds

      - codebuild:StartBuild
    Resource: 'resource_ARN'
    Effect: Allow
    Action:
      - devicefarm:ListProjects

    devicefarm:ListDevicePools

      - devicefarm:GetRun
      - devicefarm:GetUpload
      - devicefarm:CreateUpload
      - devicefarm:ScheduleRun
    Resource: 'resource_ARN'
    Effect: Allow
    Action:
      - lambda:InvokeFunction
      - lambda:ListFunctions
    Resource: 'resource_ARN'
    Effect: Allow
```

Action: - iam:PassRole Resource: 'resource_ARN' Effect: Allow Action: - elasticbeanstalk:* - ec2:* - elasticloadbalancing:* - autoscaling:* - cloudwatch:* - s3:* - sns:* - cloudformation:* - rds:* - sqs:* - ecs:* Resource: 'resource_ARN' AppPipeline: Type: AWS::CodePipeline::Pipeline **Properties:** Name: s3-events-pipeline RoleArn: !GetAtt CodePipelineServiceRole.Arn Stages: _ Name: Source Actions: _ Name: SourceAction ActionTypeId: Category: Source Owner: AWS Version: 1 Provider: S3 OutputArtifacts: - Name: SourceOutput Configuration: S3Bucket: !Ref SourceBucket S3ObjectKey: !Ref SourceObjectKey PollForSourceChanges: false RunOrder: 1 Name: Beta

```
Actions:
           _
             Name: BetaAction
             InputArtifacts:
               - Name: SourceOutput
             ActionTypeId:
               Category: Deploy
               Owner: AWS
               Version: 1
               Provider: CodeDeploy
             Configuration:
               ApplicationName: !Ref ApplicationName
               DeploymentGroupName: !Ref BetaFleet
             RunOrder: 1
    ArtifactStore:
       Type: S3
       Location: !Ref CodePipelineArtifactStoreBucket
 EventRole:
  Type: AWS::IAM::Role
  Properties:
    AssumeRolePolicyDocument:
       Version: 2012-10-17
       Statement:
           Effect: Allow
           Principal:
             Service:
               - events.amazonaws.com
           Action: sts:AssumeRole
     Path: /
     Policies:
         PolicyName: eb-pipeline-execution
         PolicyDocument:
           Version: 2012-10-17
           Statement:
               Effect: Allow
               Action: codepipeline:StartPipelineExecution
               Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region',
':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
EventRule:
  Type: AWS::Events::Rule
  Properties:
```

```
EventPattern:
        source:
          - aws.s3
        detail-type:
          - 'AWS API Call via CloudTrail'
        detail:
          eventSource:
            - s3.amazonaws.com
          eventName:
            - PutObject
            - CompleteMultipartUpload
          resources:
            ARN:
              - !Join [ '', [ !GetAtt SourceBucket.Arn, '/', !Ref
 SourceObjectKey ] ]
      Targets:
          Arn:
            !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
 'AWS::AccountId', ':', !Ref AppPipeline ] ]
          RoleArn: !GetAtt EventRole.Arn
          Id: codepipeline-AppPipeline
Outputs:
  SourceBucketARN:
    Description: "S3 bucket ARN that Cloudtrail will use"
    Value: !GetAtt SourceBucket.Arn
    Export:
      Name: SourceBucketARN
```

JSON

```
},
"CodePipelineArtifactStoreBucketPolicy": {
    "Type": "AWS::S3::BucketPolicy",
    "Properties": {
        "Bucket": {
            "Ref": "CodePipelineArtifactStoreBucket"
        },
        "PolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                {
                     "Sid": "DenyUnEncryptedObjectUploads",
                    "Effect": "Deny",
                     "Principal": "*",
                     "Action": "s3:PutObject",
                     "Resource": {
                         "Fn::Join": [
                             "",
                             Ε
                                 {
                                      "Fn::GetAtt": [
                                          "CodePipelineArtifactStoreBucket",
                                          "Arn"
                                     ]
                                 },
                                 "/*"
                             ]
                         ]
                    },
                     "Condition": {
                         "StringNotEquals": {
                             "s3:x-amz-server-side-encryption": "aws:kms"
                         }
                    }
                },
                {
                     "Sid": "DenyInsecureConnections",
                     "Effect": "Deny",
                     "Principal": "*",
                     "Action": "s3:*",
                     "Resource": {
                         "Fn::Join": [
                             "",
                             Γ
```

```
{
                                      "Fn::GetAtt": [
                                          "CodePipelineArtifactStoreBucket",
                                          "Arn"
                                     ]
                                 },
                                 "/*"
                             ]
                         ]
                     },
                     "Condition": {
                         "Bool": {
                             "aws:SecureTransport": false
                         }
                     }
                }
            ]
        }
    }
},
"CodePipelineServiceRole": {
    "Type": "AWS:::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                 {
                     "Effect": "Allow",
                     "Principal": {
                         "Service": [
                             "codepipeline.amazonaws.com"
                         1
                     },
                     "Action": "sts:AssumeRole"
                }
            ]
        },
        "Path": "/",
        "Policies": [
            {
                 "PolicyName": "AWS-CodePipeline-Service-3",
                 "PolicyDocument": {
                     "Version": "2012-10-17",
                     "Statement": [
```

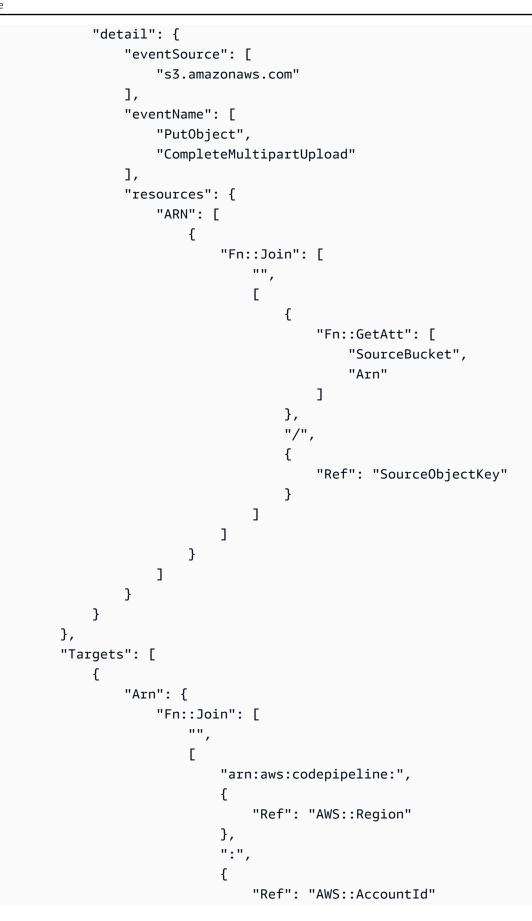
```
{
    "Effect": "Allow",
    "Action": [
        "codecommit:CancelUploadArchive",
        "codecommit:GetBranch",
        "codecommit:GetCommit",
        "codecommit:GetUploadArchiveStatus",
        "codecommit:UploadArchive"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "codedeploy:CreateDeployment",
        "codedeploy:GetApplicationRevision",
        "codedeploy:GetDeployment",
        "codedeploy:GetDeploymentConfig",
        "codedeploy:RegisterApplicationRevision"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "codebuild:BatchGetBuilds",
        "codebuild:StartBuild"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "devicefarm:ListProjects",
        "devicefarm:ListDevicePools",
        "devicefarm:GetRun",
        "devicefarm:GetUpload",
        "devicefarm:CreateUpload",
        "devicefarm:ScheduleRun"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
```

```
"Action": [
                                 "lambda:InvokeFunction",
                                 "lambda:ListFunctions"
                             ],
                             "Resource": "resource_ARN"
                         },
                         {
                             "Effect": "Allow",
                             "Action": [
                                 "iam:PassRole"
                             ],
                             "Resource": "resource_ARN"
                         },
                         {
                             "Effect": "Allow",
                             "Action": [
                                 "elasticbeanstalk:*",
                                 "ec2:*",
                                 "elasticloadbalancing:*",
                                 "autoscaling:*",
                                 "cloudwatch:*",
                                 "s3:*",
                                 "sns:*",
                                 "cloudformation:*",
                                 "rds:*",
                                 "sqs:*",
                                 "ecs:*"
                             ],
                             "Resource": "resource_ARN"
                         }
                    ]
                }
            }
        ]
    }
},
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
    "Properties": {
        "Name": "s3-events-pipeline",
        "RoleArn": {
            "Fn::GetAtt": [
                 "CodePipelineServiceRole",
                 "Arn"
```

```
]
},
"Stages": [
    {
        "Name": "Source",
        "Actions": [
            {
                 "Name": "SourceAction",
                 "ActionTypeId": {
                     "Category": "Source",
                     "Owner": "AWS",
                     "Version": 1,
                     "Provider": "S3"
                },
                 "OutputArtifacts": [
                     {
                         "Name": "SourceOutput"
                     }
                ],
                "Configuration": {
                     "S3Bucket": {
                         "Ref": "SourceBucket"
                     },
                     "S3ObjectKey": {
                         "Ref": "SourceObjectKey"
                     },
                     "PollForSourceChanges": false
                },
                "RunOrder": 1
            }
        ]
    },
    {
        "Name": "Beta",
        "Actions": [
            {
                "Name": "BetaAction",
                "InputArtifacts": [
                     {
                         "Name": "SourceOutput"
                     }
                ],
                "ActionTypeId": {
                     "Category": "Deploy",
```

```
"Owner": "AWS",
                             "Version": 1,
                             "Provider": "CodeDeploy"
                         },
                         "Configuration": {
                             "ApplicationName": {
                                 "Ref": "ApplicationName"
                             },
                             "DeploymentGroupName": {
                                 "Ref": "BetaFleet"
                             }
                         },
                         "RunOrder": 1
                    }
                ]
            }
        ],
        "ArtifactStore": {
            "Type": "S3",
            "Location": {
                 "Ref": "CodePipelineArtifactStoreBucket"
            }
        }
    }
},
"EventRole": {
    "Type": "AWS::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                 {
                     "Effect": "Allow",
                     "Principal": {
                         "Service": [
                             "events.amazonaws.com"
                         ]
                    },
                     "Action": "sts:AssumeRole"
                }
            ]
        },
        "Path": "/",
        "Policies": [
```

```
{
                 "PolicyName": "eb-pipeline-execution",
                 "PolicyDocument": {
                     "Version": "2012-10-17",
                     "Statement": [
                         {
                             "Effect": "Allow",
                             "Action": "codepipeline:StartPipelineExecution",
                             "Resource": {
                                 "Fn::Join": [
                                      "",
                                      Ε
                                          "arn:aws:codepipeline:",
                                          {
                                              "Ref": "AWS::Region"
                                          },
                                          ":",
                                          {
                                              "Ref": "AWS::AccountId"
                                          },
                                          ":",
                                          {
                                              "Ref": "AppPipeline"
                                          }
                                     ]
                                 ]
                             }
                         }
                     ]
                }
            }
        ]
    }
},
"EventRule": {
    "Type": "AWS::Events::Rule",
    "Properties": {
        "EventPattern": {
            "source": [
                 "aws.s3"
            ],
            "detail-type": [
                 "AWS API Call via CloudTrail"
            ],
```



```
},
                                      ":",
                                      {
                                           "Ref": "AppPipeline"
                                      }
                                  ]
                              ]
                         },
                          "RoleArn": {
                              "Fn::GetAtt": [
                                  "EventRole",
                                  "Arn"
                              ]
                          },
                          "Id": "codepipeline-AppPipeline"
                     }
                 ]
            }
        }
    },
    "Outputs" : {
        "SourceBucketARN" : {
             "Description" : "S3 bucket ARN that Cloudtrail will use",
            "Value" : { "Fn::GetAtt": ["SourceBucket", "Arn"] },
            "Export" : {
                 "Name" : "SourceBucketARN"
            }
        }
    }
}
. . .
```

Migrate polling pipelines for a GitHub (via OAuth app) source action to connections

You can migrate a GitHub (via OAuth app) source action to use connections for your external repository. This is the recommended change detection method for pipelines with a GitHub (via OAuth app) source action.

For a pipeline with a GitHub (via OAuth app) source action, we recommend modifying the pipeline to use a GitHub (via GitHub App) action so that change detection is automated through Amazon CodeConnections. For more information about working with connections, see <u>GitHub connections</u>.

Create a connection to GitHub (console)

You can use the console to create a connection to GitHub.

Step 1: Replace your GitHub (via OAuth app) action

Use the pipeline edit page to replace your GitHub (via OAuth app) action with a GitHub (via GitHub App) action.

To replace your GitHub (via OAuth app) action

- 1. Sign in to the CodePipeline console.
- 2. Choose your pipeline, and choose **Edit**. Choose **Edit stage** on your source stage. A message displays that recommends you update your action.
- 3. In Action provider, choose GitHub (via GitHub App).
- 4. Do one of the following:
 - Under **Connection**, if you have not already created a connection to your provider, choose **Connect to GitHub**. Proceed to Step 2: Create a connection to GitHub.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to Step 3: Save the Source Action for Your Connection.

Step 2: Create a connection to GitHub

After you choose to create the connection, the **Connect to GitHub** page is shown.

To create a connection to GitHub

1. Under **GitHub connection settings**, your connection name is shown in **Connection name**.

Under GitHub Apps, choose an app installation or choose Install a new app to create one.

i Note

You install one app for all of your connections to a particular provider. If you have already installed the GitHub app, choose it and skip this step.

- 2. If the authorization page for GitHub displays, log in with your credentials and then choose to continue.
- 3. On the app installation page, a message shows that the AWS CodeStar app is trying to connect to your GitHub account.

🚯 Note

You only install the app once for each GitHub account. If you previously installed the app, you can choose **Configure** to proceed to a modification page for your app installation, or you can use the back button to return to the console.

- 4. On the Install AWS CodeStar page, choose Install.
- 5. On the **Connect to GitHub** page, the connection ID for your new installation is displayed. Choose **Connect**.

Step 3: Save your GitHub source action

Complete your updates on the **Edit action** page to save your new source action.

To save your GitHub source action

1. In **Repository**, enter the name of your third-party repository. In **Branch**, enter the branch where you want your pipeline to detect source changes.



2. In **Output artifact format**, choose the format for your artifacts.

- To store output artifacts from the GitHub action using the default method, choose
 CodePipeline default. The action accesses the files from the GitHub repository and stores the artifacts in a ZIP file in the pipeline artifact store.
- To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose Full clone. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Add CodeBuild GitClone permissions for connections to Bitbucket</u>, <u>GitHub, GitHub Enterprise Server, or GitLab.com</u>. For a tutorial that shows you how to use the **Full clone** option, see Tutorial: Use full clone with a GitHub pipeline source.

- 3. In **Output artifacts**, you can retain the name of the output artifact for this action, such as SourceArtifact. Choose **Done** to close the **Edit action** page.
- 4. Choose **Done** to close the stage editing page. Choose **Save** to close the pipeline editing page.

Create a connection to GitHub (CLI)

You can use the Amazon Command Line Interface (Amazon CLI) to create a connection to GitHub.

To do this, use the **create-connection** command.

<u> Important</u>

A connection created through the Amazon CLI or Amazon CloudFormation is in PENDING status by default. After you create a connection with the CLI or Amazon CloudFormation, use the console to edit the connection to make its status AVAILABLE.

To create a connection to GitHub

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-connection command, specifying the --provider-type and -connection-name for your connection. In this example, the third-party provider name is GitHub and the specified connection name is MyConnection.

aws codeconnections create-connection --provider-type GitHub --connection-name MyConnection

If successful, this command returns the connection ARN information similar to the following.

```
{
    "ConnectionArn": "arn:aws:codeconnections:us-west-2:account_id:connection/
aEXAMPLE-8aad-4d5d-8878-dfcab0bc441f"
}
```

2. Use the console to complete the connection.

Migrate polling pipelines for a GitHub (via OAuth app) source action to webhooks

You can migrate your pipeline to use webhooks to detect changes in your GitHub source repository. This migration to webhooks is for the GitHub (via OAuth app) action only.

- Console: <u>Migrate polling pipelines to webhooks (GitHub (via OAuth app) source actions)</u> (console)
- CLI: Migrate polling pipelines to webhooks (GitHub (via OAuth app) source actions) (CLI)
- Amazon CloudFormation: Update pipelines for push events (GitHub (via OAuth app) source actions) (Amazon CloudFormation template)

<u> Important</u>

When creating CodePipeline webhooks, do not use your own credentials or reuse the same secret token across multiple webhooks. For optimal security, generate a unique secret token for each webhook you create. The secret token is an arbitrary string that you provide, which GitHub uses to compute and sign the webhook payloads sent to CodePipeline, for protecting the integrity and authenticity of the webhook payloads. Using your own credentials or reusing the same token across multiple webhooks can lead to security vulnerabilities.

Migrate polling pipelines to webhooks (GitHub (via OAuth app) source actions) (console)

For the GitHub (via OAuth app) source action, you can use the CodePipeline console to update your pipeline to use webhooks to detect changes in your GitHub source repository.

Follow these steps to edit a pipeline that is using polling (periodic checks) to use EventBridge instead. If you want to create a pipeline, see <u>Create a pipeline</u>, stages, and actions.

When you use the console, the PollForSourceChanges parameter for your pipelined is changed for you. The GitHub webhook is created and registered for you.

To edit the pipeline source stage

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit. This opens a detailed view of the pipeline, including the state of each of the actions in each stage of the pipeline.
- 3. On the pipeline details page, choose **Edit**.
- 4. In **Edit stage**, choose the edit icon on the source action.
- 5. Expand Change detection options and choose Use Amazon CloudWatch Events to automatically start my pipeline when a change occurs (recommended).

A message is displayed to advise that CodePipeline creates a webhook in GitHub to detect source changes: Amazon CodePipeline will create a webhook for you. You can opt-out in the options below. Choose **Update**. In addition to the webhook, CodePipeline creates the following:

- A secret, randomly generated and used to authorize the connection to GitHub.
- The webhook URL, generated using the public endpoint for the Region.

CodePipeline registers the webhook with GitHub. This subscribes the URL to receive repository events.

6. When you have finished editing your pipeline, choose **Save pipeline changes** to return to the summary page.

A message displays the name of the webhook to be created for your pipeline. Choose **Save and continue**.

7. To test your action, release a change by using the Amazon CLI to commit a change to the source specified in the source stage of the pipeline.

Migrate polling pipelines to webhooks (GitHub (via OAuth app) source actions) (CLI)

Follow these steps to edit a pipeline that is using periodic checks to use a webhook instead. If you want to create a pipeline, see <u>Create a pipeline</u>, stages, and actions.

To build an event-driven pipeline, you edit the PollForSourceChanges parameter of your pipeline and then create the following resources manually:

• GitHub webhook and authorization parameters

To create and register your webhook

🚯 Note

When you use the CLI or Amazon CloudFormation to create a pipeline and add a webhook, you must disable periodic checks. To disable periodic checks, you must explicitly add the PollForSourceChanges parameter and set it to false, as detailed in the final procedure below. Otherwise, the default for a CLI or Amazon CloudFormation pipeline is that PollForSourceChanges defaults to true and does not display in the pipeline structure output. For more information about PollForSourceChanges defaults, see <u>Valid</u> settings for the PollForSourceChanges parameter.

1. In a text editor, create and save a JSON file for the webhook you want to create. Use this sample file for a webhook named my-webhook:

```
{
    "webhook": {
        "name": "my-webhook",
        "targetPipeline": "pipeline_name",
        "targetAction": "source_action_name",
```

```
"filters": [{
    "jsonPath": "$.ref",
    "matchEquals": "refs/heads/{Branch}"
}],
"authentication": "GITHUB_HMAC",
"authenticationConfiguration": {
    "SecretToken": "secret"
  }
  }
}
```

2. Call the **put-webhook** command and include the --cli-input and --region parameters.

The following sample command creates a webhook with the webhook_j son JSON file.

```
aws codepipeline put-webhook --cli-input-json file://webhook_json.json --region
  "eu-central-1"
```

3. In the output shown in this example, the URL and ARN are returned for a webhook named mywebhook.

```
{
    "webhook": {
        "url": "https://webhooks.domain.com/
trigger111111111EXAMPLE111111111111111111,
        "definition": {
            "authenticationConfiguration": {
                "SecretToken": "secret"
            },
            "name": "my-webhook",
            "authentication": "GITHUB_HMAC",
            "targetPipeline": "pipeline_name",
            "targetAction": "Source",
            "filters": [
                {
                    "jsonPath": "$.ref",
                    "matchEquals": "refs/heads/{Branch}"
                }
            ]
        },
        "arn": "arn:aws:codepipeline:eu-central-1:ACCOUNT_ID:webhook:my-webhook"
    },
    "tags": [{
```

```
"key": "Project",
    "value": "ProjectA"
}]
}
```

This example adds tagging to the webhook by including the Project tag key and ProjectA value on the webhook. For more information about tagging resources in CodePipeline, see Tagging resources.

4. Call the **register-webhook-with-third-party** command and include the --webhook-name parameter.

The following sample command registers a webhook named my-webhook.

aws codepipeline register-webhook-with-third-party --webhook-name my-webhook

To edit your pipeline's PollForSourceChanges parameter

▲ Important

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

 Run the get-pipeline command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, you would type the following command:

```
aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json
```

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Open the JSON file in any plain-text editor and edit the source stage by changing or adding the PollForSourceChanges parameter. In this example, for a repository named UserGitHubRepo, the parameter is set to false.

Why am I making this change? Changing this parameter turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "Owner": "name",
    "Repo": "UserGitHubRepo",
    "PollForSourceChanges": "false",
    "Branch": "main",
    "OAuthToken": "****"
},
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, you must edit the structure in the JSON file by removing the metadata lines from the file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata" section from the pipeline structure in the JSON file, including the: { } and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
},
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file, similar to the following:

<u> Important</u>

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

Update pipelines for push events (GitHub (via OAuth app) source actions) (Amazon CloudFormation template)

Follow these steps to update your pipeline (with a GitHub source) from periodic checks (polling) to event-based change detection using webhooks.

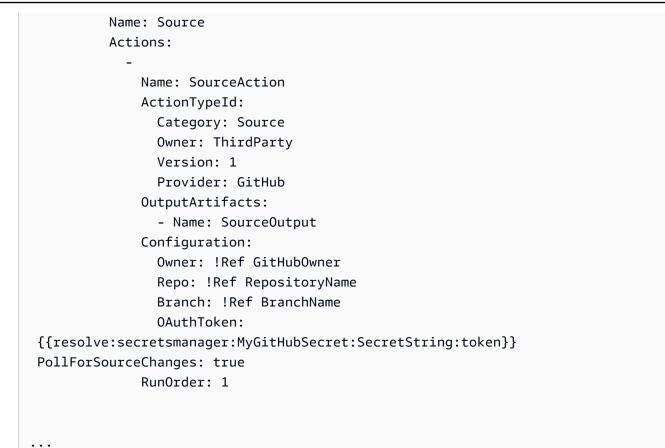
To build an event-driven pipeline with Amazon CodeCommit, you edit the PollForSourceChanges parameter of your pipeline and then add a GitHub webhook resource to your template.

If you use Amazon CloudFormation to create and manage your pipelines, your template has content like the following.

1 Note

Note the PollForSourceChanges configuration property in the source stage. If your template doesn't include that property, then PollForSourceChanges is set to true by default.

```
Resources:
AppPipeline:
Type: AWS::CodePipeline::Pipeline
Properties:
Name: github-polling-pipeline
RoleArn:
!GetAtt CodePipelineServiceRole.Arn
Stages:
```



JSON

```
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
   "Properties": {
        "Name": "github-polling-pipeline",
        "RoleArn": {
            "Fn::GetAtt": [
                "CodePipelineServiceRole",
                "Arn"
            1
        },
        "Stages": [
            {
                "Name": "Source",
                "Actions": [
                    {
                        "Name": "SourceAction",
                        "ActionTypeId": {
                             "Category": "Source",
```

```
"Owner": "ThirdParty",
                                      "Version": 1,
                                      "Provider": "GitHub"
                                 },
                                 "OutputArtifacts": [
                                      {
                                          "Name": "SourceOutput"
                                      }
                                 ],
                                 "Configuration": {
                                      "Owner": {
                                          "Ref": "GitHubOwner"
                                      },
                                      "Repo": {
                                          "Ref": "RepositoryName"
                                      },
                                      "Branch": {
                                          "Ref": "BranchName"
                                      },
                                      "OAuthToken":
"{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}",
                                      "PollForSourceChanges": true
                                 },
                                 "RunOrder": 1
                             }
                         ]
                     },
. . .
```

To add parameters and create a webhook in your template

We strongly recommend that you use Amazon Secrets Manager to store your credentials. If you use Secrets Manager, you must have already configured and stored your secret parameters in Secrets Manager. This example uses dynamic references to Secrets Manager for the GitHub credentials for your webhook. For more information, see <u>Using Dynamic References to Specify Template Values</u>.

<u> Important</u>

When passing secret parameters, do not enter the value directly into the template. The value is rendered as plaintext and is therefore readable. For security reasons, do not use plaintext in your Amazon CloudFormation template to store your credentials.

When you use the CLI or Amazon CloudFormation to create a pipeline and add a webhook, you must disable periodic checks.

🚯 Note

To disable periodic checks, you must explicitly add the PollForSourceChanges parameter and set it to false, as detailed in the final procedure below. Otherwise, the default for a CLI or Amazon CloudFormation pipeline is that PollForSourceChanges defaults to true and does not display in the pipeline structure output. For more information about PollForSourceChanges defaults, see <u>Valid settings for the PollForSourceChanges</u> parameter.

1. In the template, under Resources, add your parameters:

YAML

```
Parameters:
GitHubOwner:
Type: String
```

JSON

```
{
    "Parameters": {
        "BranchName": {
            "Description": "GitHub branch name",
            "Type": "String",
            "Default": "main"
        },
        "GitHubOwner": {
    }
}
```

```
"Type": "String"
},
...
```

 Use the AWS::CodePipeline::Webhook Amazon CloudFormation resource to add a webhook.

í) Note

The TargetAction you specify must match the Name property of the source action defined in the pipeline.

If RegisterWithThirdParty is set to true, make sure the user associated to the OAuthToken can set the required scopes in GitHub. The token and webhook require the following GitHub scopes:

- repo used for full control to read and pull artifacts from public and private repositories into a pipeline.
- admin:repo_hook used for full control of repository hooks.

Otherwise, GitHub returns a 404. For more information about the 404 returned, see <u>https://</u>help.github.com/articles/about-webhooks.

YAML

```
AppPipelineWebhook:
Type: AWS::CodePipeline::Webhook
Properties:
Authentication: GITHUB_HMAC
AuthenticationConfiguration:
SecretToken:
{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}
Filters:
JsonPath: "$.ref"
MatchEquals: refs/heads/{Branch}
TargetPipeline: !Ref AppPipeline
TargetAction: SourceAction
```

```
Name: AppPipelineWebhook
TargetPipelineVersion: !GetAtt AppPipeline.Version
RegisterWithThirdParty: true
```

JSON

. . .

```
"AppPipelineWebhook": {
    "Type": "AWS::CodePipeline::Webhook",
    "Properties": {
        "Authentication": "GITHUB_HMAC",
        "AuthenticationConfiguration": {
            "SecretToken":
 "{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}"
        },
        "Filters": [{
            "JsonPath": "$.ref",
            "MatchEquals": "refs/heads/{Branch}"
        }],
        "TargetPipeline": {
            "Ref": "AppPipeline"
        },
        "TargetAction": "SourceAction",
        "Name": "AppPipelineWebhook",
        "TargetPipelineVersion": {
            "Fn::GetAtt": [
              "AppPipeline",
              "Version"
            1
        },
        "RegisterWithThirdParty": true
    }
},
. . .
```

- 3. Save the updated template to your local computer, and then open the Amazon CloudFormation console.
- 4. Choose your stack, and then choose **Create Change Set for Current Stack**.

- 5. Upload the template, and then view the changes listed in Amazon CloudFormation. These are the changes to be made to the stack. You should see your new resources in the list.
- 6. Choose **Execute**.

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing this parameter to false turns off periodic checks so you can use event-based change detection only.

YAML

Name: Source Actions: Name: SourceAction ActionTypeId: Category: Source Owner: ThirdParty Version: 1 Provider: GitHub OutputArtifacts: - Name: SourceOutput Configuration: Owner: !Ref GitHubOwner Repo: !Ref RepositoryName Branch: !Ref BranchName OAuthToken: {{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}

PollForSourceChanges: false RunOrder: 1

JSON

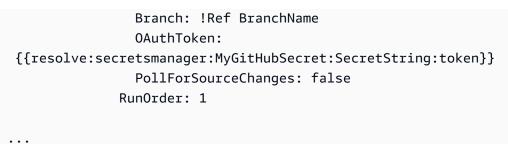
```
{
   "Name": "Source",
   "Actions": [{
 "Name": "SourceAction",
 "ActionTypeId": {
     "Category": "Source",
     "Owner": "ThirdParty",
     "Version": 1,
     "Provider": "GitHub"
},
"OutputArtifacts": [{
    "Name": "SourceOutput"
}],
"Configuration": {
    "Owner": {
  "Ref": "GitHubOwner"
    },
    "Repo": {
  "Ref": "RepositoryName"
    },
    "Branch": {
        "Ref": "BranchName"
    },
    "OAuthToken":
"{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}",
    PollForSourceChanges: false
},
"RunOrder": 1
   31
```

Example

When you create these resources with Amazon CloudFormation, the webhook defined is created in the specified GitHub repository. Your pipeline is triggered on commit.

YAML

```
Parameters:
  GitHubOwner:
    Type: String
Resources:
  AppPipelineWebhook:
    Type: AWS::CodePipeline::Webhook
    Properties:
      Authentication: GITHUB_HMAC
      AuthenticationConfiguration:
        SecretToken: {{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}
      Filters:
          JsonPath: "$.ref"
          MatchEquals: refs/heads/{Branch}
      TargetPipeline: !Ref AppPipeline
      TargetAction: SourceAction
      Name: AppPipelineWebhook
      TargetPipelineVersion: !GetAtt AppPipeline.Version
      RegisterWithThirdParty: true
  AppPipeline:
    Type: AWS::CodePipeline::Pipeline
    Properties:
      Name: github-events-pipeline
      RoleArn:
        !GetAtt CodePipelineServiceRole.Arn
      Stages:
        _
          Name: Source
          Actions:
              Name: SourceAction
              ActionTypeId:
                Category: Source
                Owner: ThirdParty
                Version: 1
                Provider: GitHub
              OutputArtifacts:
                - Name: SourceOutput
              Configuration:
                Owner: !Ref GitHubOwner
                Repo: !Ref RepositoryName
```



JSON

```
{
    "Parameters": {
        "BranchName": {
            "Description": "GitHub branch name",
            "Type": "String",
            "Default": "main"
        },
        "RepositoryName": {
            "Description": "GitHub repository name",
            "Type": "String",
            "Default": "test"
        },
        "GitHubOwner": {
            "Type": "String"
        },
        "ApplicationName": {
            "Description": "CodeDeploy application name",
            "Type": "String",
            "Default": "DemoApplication"
        },
        "BetaFleet": {
            "Description": "Fleet configured in CodeDeploy",
            "Type": "String",
            "Default": "DemoFleet"
        }
    },
    "Resources": {
. . .
        },
        "AppPipelineWebhook": {
            "Type": "AWS::CodePipeline::Webhook",
```

```
"Properties": {
               "Authentication": "GITHUB_HMAC",
               "AuthenticationConfiguration": {
                   "SecretToken": {
"{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}"
                   }
               },
               "Filters": [
                   {
                        "JsonPath": "$.ref",
                        "MatchEquals": "refs/heads/{Branch}"
                   }
               ],
               "TargetPipeline": {
                   "Ref": "AppPipeline"
               },
               "TargetAction": "SourceAction",
               "Name": "AppPipelineWebhook",
               "TargetPipelineVersion": {
                   "Fn::GetAtt": [
                        "AppPipeline",
                        "Version"
                   ]
               },
               "RegisterWithThirdParty": true
           }
       },
       "AppPipeline": {
           "Type": "AWS::CodePipeline::Pipeline",
           "Properties": {
               "Name": "github-events-pipeline",
               "RoleArn": {
                   "Fn::GetAtt": [
                        "CodePipelineServiceRole",
                        "Arn"
                   ]
               },
               "Stages": [
                   {
                        "Name": "Source",
                        "Actions": [
                           {
                                "Name": "SourceAction",
```

```
"ActionTypeId": {
                                     "Category": "Source",
                                     "Owner": "ThirdParty",
                                     "Version": 1,
                                     "Provider": "GitHub"
                                 },
                                 "OutputArtifacts": [
                                     {
                                          "Name": "SourceOutput"
                                     }
                                 ],
                                 "Configuration": {
                                     "Owner": {
                                          "Ref": "GitHubOwner"
                                     },
                                     "Repo": {
                                          "Ref": "RepositoryName"
                                     },
                                     "Branch": {
                                          "Ref": "BranchName"
                                     },
                                     "OAuthToken":
"{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}",
                                     "PollForSourceChanges": false
                                 },
                                 "RunOrder": 1
. . .
```

Create the CodePipeline service role

When you create a pipeline, you create a service role or use an existing service role.

You can use the CodePipeline console or the Amazon CLI to create a CodePipeline service role. A service role is required to create a pipeline, and the pipeline is always associated to that service role.

Before you create a pipeline with the Amazon CLI, you must create a CodePipeline service role for your pipeline. For an example Amazon CloudFormation template with the service role and policy specified, see the tutorials in <u>Tutorial: Create a pipeline that uses variables from Amazon</u> CloudFormation deployment actions.

The service role is not an Amazon managed role but is created initially for pipeline creation, and then as new permissions are added to the service role policy, you may need to update the service role for your pipeline. Once your pipeline is created with a service role, you cannot apply a different service role to that pipeline. Attach the recommended policy to the service role.

For more information about the service role, see <u>Manage the CodePipeline service role</u>.

Create the CodePipeline service role (console)

When you use the console to create a pipeline, you create the CodePipeline service role with the pipeline creation wizard.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

Choose **Create pipeline** and complete the **Step 1: Choose pipeline settings** page in the pipeline creation wizard.

í) Note

After you create a pipeline, you cannot change its name. For information about other limitations, see <u>Quotas in Amazon CodePipeline</u>.

- 2. In **Service role**, choose **New service role** to allow CodePipeline to create a new service role in IAM.
- 3. Complete the pipeline creation. Your pipeline service role is available to view in your list of IAM roles, and you can view the service role ARN associated to a pipeline by running the getpipeline command with the Amazon CLI.

Create the CodePipeline service role (CLI)

Before you create a pipeline with the Amazon CLI or Amazon CloudFormation, you must create a CodePipeline service role for your pipeline and attach the service role policy and the trust policy. To use the CLI to create your service role, use the steps below to first create a trust policy JSON and the role policy JSON as separate files in the directory where you will run the CLI commands.

🚯 Note

We recommend that you allow only administrative users to create any service role. A person with permissions to create a role and attach any policy can escalate their own permissions. Instead, create a policy that allows them to create only the roles that they need or have an administrator create the service role on their behalf.

 In a terminal window, enter the following command to create a file named TrustPolicy.json, where you will paste the role policy JSON. This example uses VIM.

vim TrustPolicy.json

2. Paste the following JSON into the file.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "codepipeline.amazonaws.com"
            },
            "Action": "sts:AssumeRole"
        }
    ]
}
```

To save and exit the file, enter the following VIM command:

:wq

3. In a terminal window, enter the following command to create a file named RolePolicy.json, where you will paste the role policy JSON. This example uses VIM.

vim RolePolicy.json

4. Paste the JSON policy into the file. Use the minimum service role policy as provided in CodePipeline service role policy. In addition, add the appropriate permissions to your service role based on the actions you plan to use. For a list of actions and a link to each action's required service role permissions, see Add permissions to the CodePipeline service role.

Make sure to scope down permissions as much as possible by scoping down to the resource level in the Resource field.

To save and exit the file, enter the following VIM command:

:wq

5. Enter the following command to create the role and attach the trust role policy. The policy name format is normally the same as the role name format. This examples uses the role name MyRole and the policy TrustPolicy that was created as a separate file.

```
aws iam create-role --role-name MyRole --assume-role-policy-document file://
TrustPolicy.json
```

6. Enter the following command to create the role policy and attach it to the role. The policy name format is normally the same as the role name format. This examples uses the role name MyRole and the policy MyRole that was created as a separate file.

```
aws iam put-role-policy --role-name MyRole --policy-name RolePolicy --policy-
document file://RolePolicy.json
```

7. To view the created role name and trust policy, enter the following command for the role named MyRole:

aws iam get-role --role-name MyRole

8. Use the service role ARN when you create your pipeline with the Amazon CLI or Amazon CloudFormation.

Tagging resources

A *tag* is a custom attribute label that you or Amazon assigns to an Amazon resource. Each Amazon tag has two parts:

 A tag key (for example, CostCenter, Environment, Project, or Secret). Tag keys are case sensitive. • An optional field known as a *tag value* (for example, 111122223333, Production, or a team name). Omitting the tag value is the same as using an empty string. Like tag keys, tag values are case sensitive.

Together these are known as key-value pairs.

Tags help you identify and organize your Amazon resources. Many Amazon Web Services services support tagging, so you can assign the same tag to resources from different services to indicate that the resources are related. For example, you can assign the same tag to a pipeline that you assign to an Amazon S3 source bucket.

For tips on using tags, see the Amazon Tagging Strategies post on the Amazon Answers blog.

You can tag the following resource types in CodePipeline:

- Tag a pipeline in CodePipeline
- Tag a custom action in CodePipeline

You can use the Amazon CLI, CodePipeline APIs, or Amazon SDKs to:

- Add tags to a pipeline, custom action, or webhook when you create it.
- Add, manage, and remove tags for a pipeline, custom action, or webhook.

You can also use the console to add, manage, and remove tags for a pipeline.

In addition to identifying, organizing, and tracking your resource with tags, you can use tags in IAM policies to help control who can view and interact with your resource. For examples of tag-based access policies, see Using tags to control access to CodePipeline resources.

Tag a pipeline in CodePipeline

Tags are key-value pairs associated with Amazon resources. You can apply tags to your pipelines in CodePipeline. For information about CodePipeline resource tagging, use cases, tag key and value constraints, and supported resource types, see <u>Tagging resources</u>.

You can use the CLI to specify tags when you create a pipeline. You can use the console or CLI to add or remove tags, and update the values of tags in a pipeline. You can add up to 50 tags to each pipeline.

Topics

- Tag pipelines (console)
- Tag pipelines (CLI)

Tag pipelines (console)

You can use the console or the CLI to tag resources. Pipelines are the only CodePipeline resource that can be managed with either the console or the CLI.

Topics

- Add tags to a pipeline (console)
- <u>View tags for a pipeline (console)</u>
- Edit tags for a pipeline (console)
- <u>Remove tags from a pipeline (console)</u>

Add tags to a pipeline (console)

You can use the console to add tags to an existing pipeline.

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Pipelines** page, choose the pipeline where you want to add tags.
- 3. From the navigation pane, choose **Settings**.
- 4. Under **Pipeline tags**, choose **Edit**.
- 5. In the **Key** and **Value** fields, enter a key pair for each set of tags you want to add. (The **Value** field is optional.) For example, in **Key**, enter **Project**. In **Value**, enter **ProjectA**.
- 6. (Optional) Choose **Add tag** to add more rows and enter more tags.
- 7. Choose **Submit**. The tags are listed under pipeline settings.

View tags for a pipeline (console)

You can use the console to list tags for existing pipelines.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

- 2. On the **Pipelines** page, choose the pipeline where you want to view tags.
- 3. From the navigation pane, choose **Settings**.
- 4. Under **Pipeline tags**, view the tags for the pipeline under the **Key** and **Value** columns.

Edit tags for a pipeline (console)

You can use the console to edit tags that have been added to pipelines.

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Pipelines** page, choose the pipeline where you want to update tags.
- 3. From the navigation pane, choose **Settings**.
- 4. Under **Pipeline tags**, choose **Edit**.
- 5. In the **Key** and **Value** fields, update the values in each field as needed. For example, for the **Project** key, in **Value**, change **ProjectA** to **ProjectB**.
- 6. Choose Submit.

Remove tags from a pipeline (console)

You can use the console to delete tags from pipelines. When you remove tags from the associated resource, the tags are deleted.

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Pipelines** page, choose the pipeline where you want to remove tags.
- 3. From the navigation pane, choose **Settings**.
- 4. Under **Pipeline tags**, choose **Edit**.
- 5. Next to the key and value for each tag you want to delete, choose **Remove tag**.
- 6. Choose Submit.

Tag pipelines (CLI)

You can use the CLI to tag resources. You must use the console to manage tags in pipelines.

Topics

Tag pipelines (CLI)

- Add tags to a pipeline (CLI)
- View tags for a pipeline (CLI)
- Edit tags for a pipeline (CLI)
- Remove tags from a pipeline (CLI)

Add tags to a pipeline (CLI)

You can use the console or the Amazon CLI to tag pipelines.

To add a tag to a pipeline when you create it, see Create a pipeline, stages, and actions.

In these steps, we assume that you have already installed a recent version of the Amazon CLI or updated to the current version. For more information, see <u>Installing the Amazon Command Line</u> <u>Interface</u>.

At the terminal or command line, run the **tag-resource** command, specifying the Amazon Resource Name (ARN) of the pipeline where you want to add tags and the key and value of the tag you want to add. You can add more than one tag to a pipeline. For example, to tag a pipeline named *MyPipeline* with two tags, a tag key named *DeploymentEnvironment* with the tag value of *Test*, and a tag key named *IscontainerBased* with the tag value of *true*:

```
aws codepipeline tag-resource --resource-arn arn:aws:codepipeline:us-west-2:account-
id:MyPipeline --tags key=Project,value=ProjectA key=IscontainerBased,value=true
```

If successful, this command returns nothing.

View tags for a pipeline (CLI)

Follow these steps to use the Amazon CLI to view the Amazon tags for a pipeline. If no tags have been added, the returned list is empty.

At the terminal or command line, run the **list-tags-for-resource** command. For example, to view a list of tag keys and tag values for a pipeline named *MyPipeline* with the arn:aws:codepipeline:us-west-2:account-id:MyPipeline ARN value:

```
aws codepipeline list-tags-for-resource --resource-arn arn:aws:codepipeline:us-
west-2:account-id:MyPipeline
```

If successful, this command returns information similar to the following:

```
{
    "tags": {
        "Project": "ProjectA",
        "IscontainerBased": "true"
    }
}
```

Edit tags for a pipeline (CLI)

Follow these steps to use the Amazon CLI to edit a tag for a pipeline. You can change the value for an existing key or add another key. You can also remove tags from a pipeline, as shown in the next section.

At the terminal or command line, run the **tag-resource** command, specifying the ARN of the pipeline where you want to update a tag and specify the tag key and tag value:

```
aws codepipeline tag-resource --resource-arn arn:aws:codepipeline:us-west-2:account-
id:MyPipeline --tags key=Project,value=ProjectA
```

If successful, this command returns nothing.

Remove tags from a pipeline (CLI)

Follow these steps to use the Amazon CLI to remove a tag from a pipeline. When you remove tags from the associated resource, the tags are deleted.

🚯 Note

If you delete a pipeline, all tag associations are removed from the deleted pipeline. You do not have to remove tags before you delete a pipeline.

At the terminal or command line, run the **untag-resource** command, specifying the ARN of the pipeline where you want to remove tags and the tag key of the tag you want to remove. For example, to remove multiple tags on a pipeline named *MyPipeline* with the tag keys *Project* and *IscontainerBased*:

```
aws codepipeline untag-resource --resource-arn arn:aws:codepipeline:us-west-2:account-
id:MyPipeline --tag-keys Project IscontainerBased
```

If successful, this command returns nothing. To verify the tags associated with the pipeline, run the **list-tags-for-resource** command.

Create a notification rule

You can use notification rules to notify users of important changes, such as when a pipeline starts execution. Notification rules specify both the events and the Amazon SNS topic that is used to send notifications. For more information, see <u>What are notifications</u>?

i Note

This feature is not available in theChina (Beijing) Region or the China (Ningxia) Region.

You can use the console or the Amazon CLI to create notification rules for Amazon CodePipeline.

To create a notification rule (console)

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. Choose **Pipelines**, and then choose a pipeline where you want to add notifications.
- 3. On the pipeline page, choose **Notify**, and then choose **Create notification rule**. You can also go to the **Settings** page for the pipeline and choose **Create notification rule**.
- 4. In **Notification name**, enter a name for the rule.
- 5.

In **Detail type**, choose **Basic** if you want only the information provided to Amazon EventBridge included in the notification. Choose **Full** if you want to include information provided to Amazon EventBridge and information that might be supplied by the CodePipeline or the notification manager.

For more information, see <u>Understanding Notification Contents and Security</u>.

- 6. In **Events that trigger notifications**, select the events for which you want to send notifications. For more information, see Events for Notification Rules on Pipelines.
- 7. In **Targets**, do one of the following:
 - If you have already configured a resource to use with notifications, in **Choose target type**, choose either **Amazon Q Developer in chat applications (Slack)** or **SNS topic**. In **Choose**

target, choose the name of the client (for a Slack client configured in Amazon Q Developer in chat applications) or the Amazon Resource Name (ARN) of the Amazon SNS topic (for Amazon SNS topics already configured with the policy required for notifications).

 If you have not configured a resource to use with notifications, choose Create target, and then choose SNS topic. Provide a name for the topic after codestar-notifications-, and then choose Create.

🚯 Note

- If you create the Amazon SNS topic as part of creating the notification rule, the policy that allows the notifications feature to publish events to the topic is applied for you. Using a topic created for notification rules helps ensure that you subscribe only those users that you want to receive notifications about this resource.
- You cannot create an Amazon Q Developer in chat applications client as part of creating a notification rule. If you choose Amazon Q Developer in chat applications (Slack), you will see a button directing you to configure a client in Amazon Q Developer in chat applications. Choosing that option opens the Amazon Q Developer in chat applications console. For more information, see <u>Configure Integrations</u> Between Notifications and Amazon Q Developer in chat applications.
- If you want to use an existing Amazon SNS topic as a target, you must add the required policy for AWS CodeStar Notifications in addition to any other policies that might exist for that topic. For more information, see <u>Configure Amazon SNS Topics</u> for Notifications and <u>Understanding Notification Contents and Security</u>.
- 8. To finish creating the rule, choose **Submit**.
- 9. You must subscribe users to the Amazon SNS topic for the rule before they can receive notifications. For more information, see <u>Subscribe Users to Amazon SNS Topics That Are</u> <u>Targets</u>. You can also set up integration between notifications and Amazon Q Developer in chat applications to send notifications to Amazon Chime chatrooms or Slack channels. For more information, see <u>Configure Integration Between Notifications and Amazon Q Developer</u> <u>in chat applications</u>.

To create a notification rule (Amazon CLI)

1. At a terminal or command prompt, run the **create-notification rule** command to generate the JSON skeleton:

You can name the file anything you want. In this example, the file is named *rule.json*.

2. Open the JSON file in a plain-text editor and edit it to include the resource, event types, and target you want for the rule. The following example shows a notification rule named MyNotificationRule for a pipeline named MyDemoPipeline in an Amazon acccount with the ID 123456789012. Notifications are sent with the full detail type to an Amazon SNS topic named codestar-notifications-MyNotificationTopic when pipeline executions start:

```
{
    "Name": "MyNotificationRule",
    "EventTypeIds": [
        "codepipeline-pipeline-pipeline-execution-started"
    ],
    "Resource": "arn:aws:codebuild:us-east-2:123456789012:MyDemoPipeline",
    "Targets": [
        {
            "TargetType": "SNS",
            "TargetAddress": "arn:aws:sns:us-east-2:123456789012:codestar-
notifications-MyNotificationTopic"
        }
    ],
    "Status": "ENABLED",
    "DetailType": "FULL"
}
```

Save the file.

3. Using the file you just edited, at the terminal or command line, run the **create-notificationrule** command again to create the notification rule:

```
aws codestar-notifications create-notification-rule --cli-input-json
file://rule.json
```

4. If successful, the command returns the ARN of the notification rule, similar to the following:

```
{
    "Arn": "arn:aws:codestar-notifications:us-east-1:123456789012:notificationrule/
dc82df7a-EXAMPLE"
}
```

Source actions and change detection methods

When you add a source action to your pipeline, the actions work with additional resources described in the table.

1 Note

The CodeCommit and S3 source actions require either a configured change detection resource (an EventBridge rule) or use the option to poll the repository for source changes. For pipelines with a Bitbucket, GitHub, or GitHub Enterprise Server source action, you do not have to set up a webhook or default to polling. The connections action manages change detection for you.

Source	Uses additional resources?	Steps
Amazon S3 with CloudTrail resources	This source action uses an event rule and additional CloudTrai l resources. When you use the CLI or CloudFormation to create this action, you also create and manage these resources.	See <u>Create a pipeline, stages, and</u> <u>actions</u> and <u>Connecting to Amazon</u> <u>S3 source actions that use EventBrid</u> <u>ge and Amazon CloudTrail</u>
Amazon S3 without CloudTrai l resources	This source action uses a bucket enabled for events with an event rule without the need for additional CloudTrail resources . When you use the CLI or CloudFormation to create this action, you also create and manage these resources.	See <u>Create a pipeline, stages, and</u> <u>actions</u> and <u>Connecting to Amazon</u> <u>S3 source actions with a source</u> <u>enabled for events</u>
Bitbucket Cloud	This source action uses a connectio n resource.	See Bitbucket Cloud connections

Amazon CodePipeline

Source	Uses additional resources?	Steps
Amazon CodeCommit	Amazon EventBridge (recommen ded). This is the default for pipelines with an CodeCommit source created or edited in the console.	See <u>Create a pipeline, stages, and</u> <u>actions</u> and <u>CodeCommit source</u> <u>actions and EventBridge</u>
Amazon ECR	Amazon EventBridge. This is created by the wizard for pipelines with an Amazon ECR source created or edited in the console.	See <u>Create a pipeline, stages, and</u> actions and <u>Amazon ECR source</u> actions and EventBridge resources.
GitHub or GitHub Enterprise Cloud	This source action uses a connectio n resource.	See <u>GitHub connections</u>
GitHub Enterprise Server	This source action uses a connectio n resource and a host resource.	See <u>GitHub Enterprise Server</u> connections
GitLab.com	This source action uses a connectio n resource.	See <u>GitLab.com connections</u>
GitLab self-mana ged	This source action uses a connectio n resource and a host resource.	See <u>Connections for GitLab self-</u> managed

If you have a pipeline that uses polling, you can update it to use the recommended detection method. For more information, see <u>Update polling pipelines to the recommended change</u> <u>detection method</u>.

If you want to turn off change detection for a source action that uses connections, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com, and</u> <u>GitLab self-managed actions</u>.

Connect to first-party source providers using source actions

You can use the Amazon CodePipeline console or the Amazon CLI to connect to source action providers, such as CodeCommit or S3.

🚯 Note

When you use the console to create or edit a pipeline, the change detection resources are created for you. If you use the Amazon CLI to create the pipeline, you must create the additional resources yourself. For more information, see <u>CodeCommit source actions and EventBridge</u>.

Topics

- Amazon ECR source actions and EventBridge resources
- Connecting to Amazon S3 source actions with a source enabled for events
- Connecting to Amazon S3 source actions that use EventBridge and Amazon CloudTrail
- CodeCommit source actions and EventBridge

Amazon ECR source actions and EventBridge resources

To add an Amazon ECR source action in CodePipeline, you can choose either to:

- Use the CodePipeline console Create pipeline wizard (<u>Create a custom pipeline (console</u>)) or Edit action page to choose the Amazon ECR provider option. The console creates an EventBridge rule that starts your pipeline when the source changes.
- Use the CLI to add the action configuration for the ECR action and create additional resources as follows:
 - Use the ECR example action configuration in <u>Amazon ECR source action reference</u> to create your action as shown in <u>Create a pipeline (CLI)</u>.
 - The change detection method defaults to starting the pipeline by polling the source. You should disable periodic checks and create the change detection rule manually. Use one of the

following methods: <u>Create an EventBridge rule for an Amazon ECR source (console)</u>, <u>Create an EventBridge rule for an Amazon ECR source (CLI)</u>, or <u>Create an EventBridge rule for an Amazon ECR source (Amazon CloudFormation template)</u>.

Topics

- Create an EventBridge rule for an Amazon ECR source (console)
- Create an EventBridge rule for an Amazon ECR source (CLI)
- Create an EventBridge rule for an Amazon ECR source (Amazon CloudFormation template)

Create an EventBridge rule for an Amazon ECR source (console)

To create an EventBridge rule for use in CodePipeline operations (Amazon ECR source)

- 1. Open the Amazon EventBridge console at https://console.amazonaws.cn/events/.
- 2. In the navigation pane, choose **Events**.
- 3. Choose **Create rule**, and then under **Event source**, from **Service Name**, choose **Elastic Container Registry (ECR)**.
- 4. In Event Source, choose Event Pattern.

Choose **Edit**, and then paste the following example event pattern in the **Event Source** window for a eb-test repository with an image tag of cli-testing:

```
{
    "detail-type": [
        "ECR Image Action"
    ],
    "source": [
        "aws.ecr"
    ],
    "detail": {
        "action-type": [
             "PUSH"
        ],
        "image-tag": [
            "latest"
        ],
        "repository-name": [
             "eb-test"
```

}

```
],
"result": [
"SUCCESS"
]
}
```

🚺 Note

To view the full event pattern supported for Amazon ECR events, see <u>Amazon ECR</u> <u>Events and EventBridge</u> or <u>Amazon Elastic Container Registry Events</u>.

5. Choose **Save**.

In the Event Pattern Preview pane, view the rule.

- 6. In **Targets**, choose **CodePipeline**.
- 7. Enter the pipeline ARN for the pipeline to be started by this rule.

🚯 Note

You can find the pipeline ARN in the metadata output after you run the **get-pipeline** command. The pipeline ARN is constructed in this format: arn:aws:codepipeline:*region:account:pipeline-name* Sample pipeline ARN: arn:aws:codepipeline:us-east-2:80398EXAMPLE:MyFirstPipeline

- 8. Create or specify an IAM service role that grants EventBridge permissions to invoke the target associated with your EventBridge rule (in this case, the target is CodePipeline).
 - Choose **Create a new role for this specific resource** to create a service role that gives EventBridge permissions to your start your pipeline executions.
 - Choose **Use existing role** to enter a service role that gives EventBridge permissions to your start your pipeline executions.
- 9. (Optional) To specify source overrides with a specific image ID, use the input transformer to pass the data as a JSON parameters. You can also use the input transformer to pass pipeline variables.
 - Expand Additional settings.

Under Configure target input, choose Configure input transformer.

In the dialog window, choose **Enter my own**. In the **Input path** box, type the following keyvalue pairs.

```
{"revisionValue": "$.detail.image-digest"}
```

• In the **Template** box, type the following key-value pairs.

```
{
    "sourceRevisions": [
        {
            "actionName": "Source",
            "revisionType": "IMAGE_DIGEST",
            "revisionValue": "<revisionValue>"
        }
    ],
    "variables": [
        {
            "name": "Variable_Name",
            "value": "Variable_Value"
        }
    ]
}
```

- Choose Confirm.
- 10. Review your rule setup to make sure it meets your requirements.
- 11. Choose **Configure details**.
- 12. On the **Configure rule details** page, enter a name and description for the rule, and then choose **State** to enable the rule.
- 13. If you're satisfied with the rule, choose **Create rule**.

Create an EventBridge rule for an Amazon ECR source (CLI)

Call the **put-rule** command, specifying:

• A name that uniquely identifies the rule you are creating. This name must be unique across all of the pipelines you create with CodePipeline associated with your Amazon account.

• The event pattern for the source and detail fields used by the rule. For more information, see Amazon EventBridge and Event Patterns.

To create an EventBridge rule with Amazon ECR as the event source and CodePipeline as the target

- 1. Add permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see Using resource-based policies for Amazon EventBridge.
 - a. Use the following sample to create the trust policy that allows EventBridge to assume the service role. Name the trust policy trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
        },
        "Action": "sts:AssumeRole"
        }
   ]
}
```

b. Use the following command to create the Role-for-MyRule role and attach the trust policy.

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown in this sample, for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
          "Effect": "Allow",
          "Action": [
          "codepipeline:StartPipelineExecution"
```

d. Use the following command to attach the CodePipeline-Permissions-Policy-for-EB permissions policy to the Role-for-MyRule role.

Why am I making this change? Adding this policy to the role creates permissions for EventBridge.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

 Call the put-rule command and include the --name, --event-pattern, and --role-arn parameters.

Why am I making this change? You must create an event with a rule that specifies how an image push must be made, and a target that names the pipeline to be started by the event.

The following sample command creates a rule called MyECRRepoRule.

```
aws events put-rule --name "MyECRRepoRule" --event-pattern "{\"detail-type\":[\"ECR
Image Action\"],\"source\":[\"aws.ecr\"],\"detail\":{\"action-type\":[\"PUSH\"],
\"image-tag\":[\"latest\"],\"repository-name\":[\"eb-test\"],\"result\":[\"SUCCESS
\"]}}" --role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-for-MyRule"
```

🚯 Note

To view the full event pattern supported for Amazon ECR events, see <u>Amazon ECR</u> <u>Events and EventBridge</u> or <u>Amazon Elastic Container Registry Events</u>.

- 3. To add CodePipeline as a target, call the **put-targets** command and include the following parameters:
 - The --rule parameter is used with the rule_name you created by using **put-rule**.

• The --targets parameter is used with the list Id of the target in the list of targets and the ARN of the target pipeline.

The following sample command specifies that for the rule called MyECRRepoRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The sample command also specifies an example Arn for the pipeline and the example RoleArn for the rule. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule MyECRRepoRule --targets
Id=1,Arn=arn:aws:codepipeline:us-
west-2:80398EXAMPLE:TestPipeline,RoleArn=arn:aws:iam::80398EXAMPLE:role/Role-for-
MyRule
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following JSON in your CLI command. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, IMAGE_DIGEST in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.



Create an EventBridge rule for an Amazon ECR source (Amazon CloudFormation template)

To use Amazon CloudFormation to create a rule, use the template snippet as shown here.

To update your pipeline Amazon CloudFormation template and create EventBridge rule

- 1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:
 - The first policy allows the role to be assumed.
 - The second policy provides permissions to start the pipeline.

Why am I making this change? You must create a role that can be assumed by EventBridge to start an execution in our pipeline.

YAML

```
EventRole:

Type: AWS::IAM::Role

Properties:

AssumeRolePolicyDocument:

Version: 2012-10-17

Statement:

-

Effect: Allow

Principal:

Service:
```

Amazon CodePipeline

User Guide

```
- events.amazonaws.com
Action: sts:AssumeRole
Path: /
Policies:
-
PolicyName: eb-pipeline-execution
PolicyDocument:
Version: 2012-10-17
Statement:
-
Effect: Allow
Action: codepipeline:StartPipelineExecution
Resource: !Sub arn:aws:codepipeline:${AWS::Region}:
${AWS::AccountId}:${AppPipeline}
```

JSON

```
{
    "EventRole": {
        "Type": "AWS:::IAM::Role",
        "Properties": {
            "AssumeRolePolicyDocument": {
                 "Version": "2012-10-17",
                 "Statement": [
                     {
                         "Effect": "Allow",
                         "Principal": {
                             "Service": [
                                 "events.amazonaws.com"
                             ]
                         },
                         "Action": "sts:AssumeRole"
                     }
                ]
            },
            "Path": "/",
            "Policies": [
                {
                     "PolicyName": "eb-pipeline-execution",
                     "PolicyDocument": {
                         "Version": "2012-10-17",
                         "Statement": [
                             {
```

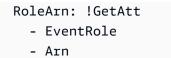
2. In the template, under Resources, use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule for the Amazon ECR source. This event pattern creates an event that monitors commits to your repository. When EventBridge detects a repository state change, the rule invokes StartPipelineExecution on your target pipeline.

Why am I making this change? You must create an event with a rule that specifies how an image push must be made, and a target that names the pipeline to be started by the event.

This snippet uses an image named eb-test with a tag of latest.

YAML

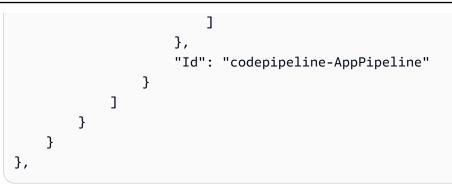
```
EventRule:
Type: 'AWS::Events::Rule'
Properties:
EventPattern:
    detail:
        action-type: [PUSH]
        image-tag: [latest]
        repository-name: [eb-test]
        result: [SUCCESS]
        detail-type: [ECR Image Action]
        source: [aws.ecr]
        Targets:
            - Arn: !Sub arn:aws:codepipeline:${AWS::Region}:${AWS::AccountId}:
${AppPipeline}
```



Id: codepipeline-AppPipeline

JSON

```
{
    "EventRule": {
        "Type": "AWS::Events::Rule",
        "Properties": {
            "EventPattern": {
                "detail": {
                     "action-type": [
                         "PUSH"
                    ],
                     "image-tag": [
                         "latest"
                    ],
                     "repository-name": [
                         "eb-test"
                    ],
                    "result": [
                         "SUCCESS"
                    ]
                },
                "detail-type": [
                     "ECR Image Action"
                ],
                "source": [
                    "aws.ecr"
                ]
            },
            "Targets": [
                {
                    "Arn": {
                         "Fn::Sub": "arn:aws:codepipeline:${AWS::Region}:
${AWS::AccountId}:${AppPipeline}"
                    },
                     "RoleArn": {
                         "Fn::GetAtt": [
                             "EventRole",
                             "Arn"
```



🚯 Note

To view the full event pattern supported for Amazon ECR events, see <u>Amazon ECR</u> <u>Events and EventBridge or Amazon Elastic Container Registry Events</u>.

- 3. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following YAML snippet. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, IMAGE_DIGEST in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
---
Rule: my-rule
Targets:
- Id: MyTargetId
Arn: ARN
InputTransformer:
InputPathsMap:
revisionValue: "$.detail.image-digest"
InputTemplate:
sourceRevisions:
actionName: Source
revisionType: IMAGE_DIGEST
revisionValue: '<revisionValue>'
```

- 4. Save the updated template to your local computer, and then open the Amazon CloudFormation console.
- 5. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 6. Upload the template, and then view the changes listed in Amazon CloudFormation. These are the changes to be made to the stack. You should see your new resources in the list.
- 7. Choose **Execute**.

Connecting to Amazon S3 source actions with a source enabled for events

The instructions in this section provide the steps for creating the S3 source action that does not require that you create or manage Amazon CloudTrail resources.

🔥 Important

The procedure to create this action without Amazon CloudTrail resources is not available in the console. To use the CLI, see the procedures here or see <u>Migrate polling pipelines with an</u> <u>S3 source enabled for events</u>.

For a pipeline with an Amazon S3 source, modify the pipeline so that change detection is automated through EventBridge and with a source bucket that is enabled for event notifications. This is the recommend method if you are using the CLI or Amazon CloudFormation to migrate your pipeline.

🚯 Note

This includes using a bucket that is enabled for event notifications, where you do not need to create a separate CloudTrail trail. If you are using the console, then an event rule and CloudTrail trail are set up for you. For those steps, see <u>Migrate polling pipelines with an S3</u> source and CloudTrail trail.

- CLI: Migrate polling pipelines with an S3 source and CloudTrail trail (CLI)
- Amazon CloudFormation: Migrate polling pipelines with an S3 source and CloudTrail trail (Amazon CloudFormation template)

Create pipelines with an S3 source enabled for events (CLI)

Follow these steps to create a pipeline with an S3 source that uses an event in EventBridge for change detection. For the full steps to create a pipeline with the CLI, see <u>Create a pipeline, stages</u>, and actions.

To build an event-driven pipeline with Amazon S3, you edit the PollForSourceChanges parameter of your pipeline and then create the following resources:

- EventBridge event rule
- IAM role to allow the EventBridge event to start your pipeline

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. Grant permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see <u>Using resource-based policies for Amazon EventBridge</u>.
 - a. Use the following sample to create the trust policy to allow EventBridge to assume the service role. Name it trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
            },
            "Action": "sts:AssumeRole"
        }
    ]
}
```

b. Use the following command to create the Role-for-MyRule role and attach the trust policy.

Why am I making this change? Adding this trust policy to the role creates permissions for EventBridge.

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown here for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "codepipeline:StartPipelineExecution"
        ],
            "Resource": [
                "arn:aws:codepipeline:us-west-2:80398EXAMPLE:MyFirstPipeline"
        ]
        }
    ]
}
```

d. Use the following command to attach the new CodePipeline-Permissions-Policyfor-EB permissions policy to the Role-for-MyRule role you created.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

2. Call the **put-rule** command and include the --name, --event-pattern, and --role-arn parameters.

The following sample command creates a rule named EnabledS3SourceRule.

```
aws events put-rule --name "EnabledS3SourceRule" --event-pattern "{\"source\":
[\"aws.s3\"],\"detail-type\":[\"Object Created\"],\"detail\":{\"bucket\":{\"name\":
[\"amzn-s3-demo-source-bucket\"]}}" --role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-
for-MyRule"
```

3. To add CodePipeline as a target, call the **put-targets** command and include the --rule and --targets parameters.

The following command specifies that for the rule named EnabledS3SourceRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule EnabledS3SourceRule --targets Id=codepipeline-
AppPipeline,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline
```

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

 Run the get-pipeline command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

This command returns nothing, but the file you created should appear in the directory where you ran the command.

 Open the JSON file in any plain-text editor and edit the source stage by changing the PollForSourceChanges parameter for a bucket named amzn-s3-demo-source-bucket to false, as shown in this example.

Why am I making this change? Setting this parameter to false turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "S3Bucket": "amzn-s3-demo-source-bucket",
    "PollForSourceChanges": "false",
    "S3ObjectKey": "index.zip"
```

},

3. If you are working with the pipeline structure retrieved using the get-pipeline command, you must remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
},
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

🛕 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

Create pipelines with an S3 source enabled for events (Amazon CloudFormation template)

This procedure is for a pipeline where the source bucket has events enabled.

Use these steps to create a pipeline with an Amazon S3 source for event-based change detection.

To build an event-driven pipeline with Amazon S3, you edit the PollForSourceChanges parameter of your pipeline and then add the following resources to your template:

• EventBridge rule and IAM role to allow this event to start your pipeline.

If you use Amazon CloudFormation to create and manage your pipelines, your template includes content like the following.

1 Note

The Configuration property in the source stage called PollForSourceChanges. If your template doesn't include that property, then PollForSourceChanges is set to true by default.

YAML

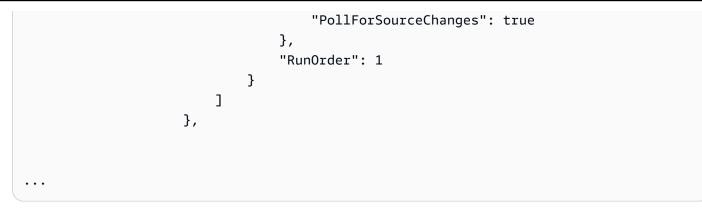
```
AppPipeline:
Type: AWS::CodePipeline::Pipeline
Properties:
RoleArn: !GetAtt CodePipelineServiceRole.Arn
Stages:
-
Name: Source
Actions:
-
Name: SourceAction
ActionTypeId:
Category: Source
Owner: AWS
Version: 1
Provider: S3
OutputArtifacts:
```

```
Name: SourceOutput
Configuration:
S3Bucket: !Ref SourceBucket
S3ObjectKey: !Ref S3SourceObjectKey
PollForSourceChanges: true
RunOrder: 1
```

JSON

. . .

```
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
   "Properties": {
        "RoleArn": {
            "Fn::GetAtt": ["CodePipelineServiceRole", "Arn"]
       },
        "Stages": [
            {
                "Name": "Source",
                "Actions": [
                    {
                        "Name": "SourceAction",
                        "ActionTypeId": {
                             "Category": "Source",
                             "Owner": "AWS",
                             "Version": 1,
                             "Provider": "S3"
                        },
                        "OutputArtifacts": [
                             {
                                 "Name": "SourceOutput"
                             }
                        ],
                        "Configuration": {
                             "S3Bucket": {
                                 "Ref": "SourceBucket"
                             },
                             "S3ObjectKey": {
                                 "Ref": "SourceObjectKey"
                            },
```



To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:
 - The first policy allows the role to be assumed.
 - The second policy provides permissions to start the pipeline.

Why am I making this change? Adding AWS:::IAM::Role resource enables Amazon CloudFormation to create permissions for EventBridge. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRole:

Type: AWS::IAM::Role

Properties:

AssumeRolePolicyDocument:

Version: 2012-10-17

Statement:

-

Effect: Allow

Principal:

Service:

- events.amazonaws.com

Action: sts:AssumeRole

Path: /

Policies:
```

```
User Guide
```

```
PolicyName: eb-pipeline-execution

PolicyDocument:

Version: 2012-10-17

Statement:

-

Effect: Allow

Action: codepipeline:StartPipelineExecution

Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref

'AWS::Region', ':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]

....
```

JSON

```
"EventRole": {
  "Type": "AWS::IAM::Role",
  "Properties": {
    "AssumeRolePolicyDocument": {
      "Version": "2012-10-17",
      "Statement": [
        {
          "Effect": "Allow",
          "Principal": {
            "Service": [
              "events.amazonaws.com"
            ]
          },
          "Action": "sts:AssumeRole"
        }
      ]
    },
    "Path": "/",
    "Policies": [
      {
        "PolicyName": "eb-pipeline-execution",
        "PolicyDocument": {
          "Version": "2012-10-17",
          "Statement": [
            {
              "Effect": "Allow",
              "Action": "codepipeline:StartPipelineExecution",
```

```
"Resource": {
                    "Fn::Join": [
                      "",
                      Γ
                        "arn:aws:codepipeline:",
                        {
                          "Ref": "AWS::Region"
                        },
                        ":",
                        {
                          "Ref": "AWS::AccountId"
                        },
                        ":",
                        {
                          "Ref": "AppPipeline"
                        }
                      ]
                    ]
. . .
```

2. Use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule. This event pattern creates an event that monitors creation or deletion of objects in your Amazon S3 source bucket. In addition, include a target of your pipeline. When an object is created, this rule invokes StartPipelineExecution on your target pipeline.

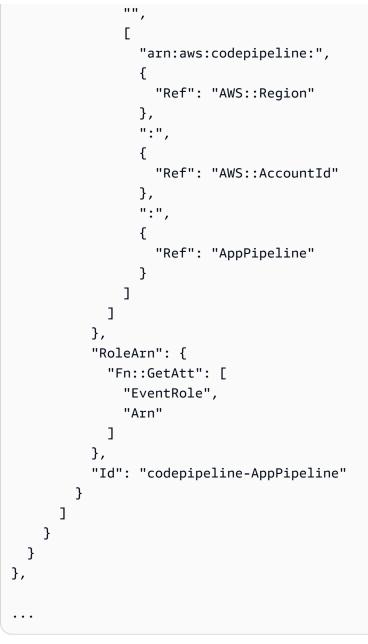
Why am I making this change? Adding the AWS::Events::Rule resource enables Amazon CloudFormation to create the event. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRule:
Type: AWS::Events::Rule
Properties:
EventBusName: default
EventPattern:
source:
- aws.s3
detail-type:
- Object Created
detail:
bucket:
```

JSON

```
"EventRule": {
 "Type": "AWS::Events::Rule",
 "Properties": {
"EventBusName": "default",
"EventPattern": {
    "source": [
"aws.s3"
    ],
    "detail-type": [
 "Object Created"
    ],
    "detail": {
  "bucket": {
      "name": [
    "s3-pipeline-source-fra-bucket"
      1
      }
          }
},
"Name": "EnabledS3SourceRule",
      "State": "ENABLED",
      "Targets": [
      {
        "Arn": {
          "Fn::Join": [
```



- 3. Save your updated template to your local computer, and open the Amazon CloudFormation console.
- 4. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 5. Upload your updated template, and then view the changes listed in Amazon CloudFormation. These are the changes that will be made to the stack. You should see your new resources in the list.
- 6. Choose **Execute**.

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing PollForSourceChanges to false turns off periodic checks so you can use event-based change detection only.

YAML

```
Name: Source
Actions:
-
Name: SourceAction
ActionTypeId:
Category: Source
Owner: AWS
Version: 1
Provider: S3
OutputArtifacts:
- Name: SourceOutput
Configuration:
S3Bucket: !Ref SourceBucket
S3ObjectKey: !Ref SourceObjectKey
PollForSourceChanges: false
RunOrder: 1
```

JSON

{

"Name": "SourceAction", "ActionTypeId": {

```
"Category": "Source",
    "Owner": "AWS",
    "Version": 1,
    "Provider": "S3"
 },
  "OutputArtifacts": [
   {
      "Name": "SourceOutput"
    }
  ],
  "Configuration": {
    "S3Bucket": {
      "Ref": "SourceBucket"
   },
    "S3ObjectKey": {
      "Ref": "SourceObjectKey"
   },
    "PollForSourceChanges": false
 },
  "RunOrder": 1
}
```

Example

When you use Amazon CloudFormation to create these resources, your pipeline is triggered when files in your repository are created or updated.

Note

Do not stop here. Although your pipeline is created, you must create a second Amazon CloudFormation template for your Amazon S3 pipeline. If you do not create the second template, your pipeline does not have any change detection functionality.

YAML

```
Parameters:
SourceObjectKey:
Description: 'S3 source artifact'
Type: String
```

```
Default: SampleApp_Linux.zip
 ApplicationName:
    Description: 'CodeDeploy application name'
    Type: String
    Default: DemoApplication
  BetaFleet:
    Description: 'Fleet configured in CodeDeploy'
    Type: String
    Default: DemoFleet
Resources:
  SourceBucket:
    Type: AWS::S3::Bucket
    Properties:
      NotificationConfiguration:
        EventBridgeConfiguration:
          EventBridgeEnabled: true
      VersioningConfiguration:
        Status: Enabled
  CodePipelineArtifactStoreBucket:
    Type: AWS::S3::Bucket
  CodePipelineArtifactStoreBucketPolicy:
    Type: AWS::S3::BucketPolicy
    Properties:
      Bucket: !Ref CodePipelineArtifactStoreBucket
      PolicyDocument:
        Version: 2012-10-17
        Statement:
            Sid: DenyUnEncryptedObjectUploads
            Effect: Deny
            Principal: '*'
            Action: s3:PutObject
            Resource: !Join [ '', [ !GetAtt CodePipelineArtifactStoreBucket.Arn, '/
*']]
            Condition:
              StringNotEquals:
                s3:x-amz-server-side-encryption: aws:kms
            Sid: DenyInsecureConnections
            Effect: Deny
            Principal: '*'
            Action: s3:*
            Resource: !Sub ${CodePipelineArtifactStoreBucket.Arn}/*
```

```
Condition:
            Bool:
              aws:SecureTransport: false
CodePipelineServiceRole:
  Type: AWS::IAM::Role
  Properties:
    AssumeRolePolicyDocument:
      Version: 2012-10-17
      Statement:
          Effect: Allow
          Principal:
            Service:
              - codepipeline.amazonaws.com
          Action: sts:AssumeRole
    Path: /
    Policies:
        PolicyName: AWS-CodePipeline-Service-3
        PolicyDocument:
          Version: 2012-10-17
          Statement:
              Effect: Allow
              Action:
                - codecommit:CancelUploadArchive
                - codecommit:GetBranch
                - codecommit:GetCommit
                - codecommit:GetUploadArchiveStatus
                - codecommit:UploadArchive
              Resource: 'resource_ARN'
              Effect: Allow
              Action:
                - codedeploy:CreateDeployment
                - codedeploy:GetApplicationRevision
                - codedeploy:GetDeployment
                - codedeploy:GetDeploymentConfig
                - codedeploy:RegisterApplicationRevision
              Resource: 'resource_ARN'
              Effect: Allow
              Action:
                - codebuild:BatchGetBuilds
```

```
- codebuild:StartBuild
              Resource: 'resource_ARN'
              Effect: Allow
              Action:
                - devicefarm:ListProjects
                - devicefarm:ListDevicePools
                - devicefarm:GetRun
                - devicefarm:GetUpload
                - devicefarm:CreateUpload
                - devicefarm:ScheduleRun
              Resource: 'resource_ARN'
              Effect: Allow
              Action:
                - lambda:InvokeFunction
                - lambda:ListFunctions
              Resource: 'resource_ARN'
              Effect: Allow
              Action:
                - iam:PassRole
              Resource: 'resource_ARN'
              Effect: Allow
              Action:
                - elasticbeanstalk:*
                - ec2:*
                - elasticloadbalancing:*
                - autoscaling:*
                - cloudwatch:*
                - s3:*
                - sns:*
                - cloudformation:*
                - rds:*
                - sqs:*
                - ecs:*
              Resource: 'resource_ARN'
AppPipeline:
  Type: AWS::CodePipeline::Pipeline
  Properties:
    Name: s3-events-pipeline
    RoleArn:
      !GetAtt CodePipelineServiceRole.Arn
```

```
Stages:
      _
        Name: Source
        Actions:
          _
            Name: SourceAction
            ActionTypeId:
              Category: Source
              Owner: AWS
              Version: 1
              Provider: S3
            OutputArtifacts:
              - Name: SourceOutput
            Configuration:
              S3Bucket: !Ref SourceBucket
              S3ObjectKey: !Ref SourceObjectKey
              PollForSourceChanges: false
            RunOrder: 1
        Name: Beta
        Actions:
            Name: BetaAction
            InputArtifacts:
              - Name: SourceOutput
            ActionTypeId:
              Category: Deploy
              Owner: AWS
              Version: 1
              Provider: CodeDeploy
            Configuration:
              ApplicationName: !Ref ApplicationName
              DeploymentGroupName: !Ref BetaFleet
            RunOrder: 1
   ArtifactStore:
      Type: S3
      Location: !Ref CodePipelineArtifactStoreBucket
EventRole:
 Type: AWS::IAM::Role
 Properties:
    AssumeRolePolicyDocument:
      Version: 2012-10-17
      Statement:
```

```
Effect: Allow
           Principal:
             Service:
               - events.amazonaws.com
           Action: sts:AssumeRole
     Path: /
     Policies:
         PolicyName: eb-pipeline-execution
         PolicyDocument:
           Version: 2012-10-17
           Statement:
               Effect: Allow
               Action: codepipeline:StartPipelineExecution
               Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region',
':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
EventRule:
  Type: AWS::Events::Rule
  Properties:
     EventBusName: default
     EventPattern:
       source:
         - aws.s3
       detail-type:
         - Object Created
       detail:
         bucket:
           name:
             - !Ref SourceBucket
     Name: EnabledS3SourceRule
    State: ENABLED
    Targets:
         Arn:
           !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref AppPipeline ] ]
         RoleArn: !GetAtt EventRole.Arn
         Id: codepipeline-AppPipeline
```

JSON

{

```
"Parameters": {
    "SourceObjectKey": {
        "Description": "S3 source artifact",
        "Type": "String",
        "Default": "SampleApp_Linux.zip"
    },
    "ApplicationName": {
        "Description": "CodeDeploy application name",
        "Type": "String",
        "Default": "DemoApplication"
    },
    "BetaFleet": {
        "Description": "Fleet configured in CodeDeploy",
        "Type": "String",
        "Default": "DemoFleet"
    }
},
"Resources": {
    "SourceBucket": {
        "Type": "AWS::S3::Bucket",
          "Properties": {
            "NotificationConfiguration": {
                "EventBridgeConfiguration": {
                     "EventBridgeEnabled": true
                }
            },
            "VersioningConfiguration": {
                "Status": "Enabled"
            }
        }
    },
    "CodePipelineArtifactStoreBucket": {
        "Type": "AWS::S3::Bucket"
    },
    "CodePipelineArtifactStoreBucketPolicy": {
        "Type": "AWS::S3::BucketPolicy",
        "Properties": {
            "Bucket": {
                "Ref": "CodePipelineArtifactStoreBucket"
            },
            "PolicyDocument": {
```

```
"Version": "2012-10-17",
"Statement": [
    {
        "Sid": "DenyUnEncryptedObjectUploads",
        "Effect": "Deny",
        "Principal": "*",
        "Action": "s3:PutObject",
        "Resource": {
            "Fn::Join": [
                "",
                Ε
                     {
                         "Fn::GetAtt": [
                             "CodePipelineArtifactStoreBucket",
                             "Arn"
                         ]
                     },
                     "/*"
                ]
            ]
        },
        "Condition": {
            "StringNotEquals": {
                "s3:x-amz-server-side-encryption": "aws:kms"
            }
        }
   },
    {
        "Sid": "DenyInsecureConnections",
        "Effect": "Deny",
        "Principal": "*",
        "Action": "s3:*",
        "Resource": {
            "Fn::Join": [
                "",
                Ε
                     {
                         "Fn::GetAtt": [
                             "CodePipelineArtifactStoreBucket",
                             "Arn"
                         ]
                     },
                     "/*"
                ]
```

```
]
                    },
                     "Condition": {
                         "Bool": {
                             "aws:SecureTransport": false
                         }
                    }
                }
            ]
        }
    }
},
"CodePipelineServiceRole": {
    "Type": "AWS:::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                {
                     "Effect": "Allow",
                     "Principal": {
                         "Service": [
                             "codepipeline.amazonaws.com"
                         ]
                    },
                     "Action": "sts:AssumeRole"
                }
            ]
        },
        "Path": "/",
        "Policies": [
            {
                 "PolicyName": "AWS-CodePipeline-Service-3",
                "PolicyDocument": {
                     "Version": "2012-10-17",
                     "Statement": [
                         {
                             "Effect": "Allow",
                             "Action": [
                                 "codecommit:CancelUploadArchive",
                                 "codecommit:GetBranch",
                                 "codecommit:GetCommit",
                                 "codecommit:GetUploadArchiveStatus",
                                 "codecommit:UploadArchive"
```

User Guide

```
],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "codedeploy:CreateDeployment",
        "codedeploy:GetApplicationRevision",
        "codedeploy:GetDeployment",
        "codedeploy:GetDeploymentConfig",
        "codedeploy:RegisterApplicationRevision"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "codebuild:BatchGetBuilds",
        "codebuild:StartBuild"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "devicefarm:ListProjects",
        "devicefarm:ListDevicePools",
        "devicefarm:GetRun",
        "devicefarm:GetUpload",
        "devicefarm:CreateUpload",
        "devicefarm:ScheduleRun"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
    "Action": [
        "lambda:InvokeFunction",
        "lambda:ListFunctions"
    ],
    "Resource": "resource_ARN"
},
{
    "Effect": "Allow",
```

```
Create pipelines with an S3 source enabled for events (Amazon CloudFormation template)
```

```
"Action": [
                                  "iam:PassRole"
                             ],
                             "Resource": "resource_ARN"
                         },
                         {
                             "Effect": "Allow",
                             "Action": [
                                  "elasticbeanstalk:*",
                                  "ec2:*",
                                  "elasticloadbalancing:*",
                                  "autoscaling:*",
                                  "cloudwatch:*",
                                  "s3:*",
                                  "sns:*",
                                  "cloudformation:*",
                                  "rds:*",
                                  "sqs:*",
                                  "ecs:*"
                             ],
                             "Resource": "resource_ARN"
                         }
                     ]
                }
            }
        ]
    }
},
"AppPipeline": {
    "Type": "AWS::CodePipeline::Pipeline",
    "Properties": {
        "Name": "s3-events-pipeline",
        "RoleArn": {
            "Fn::GetAtt": [
                 "CodePipelineServiceRole",
                 "Arn"
            ]
        },
        "Stages": [
            {
                 "Name": "Source",
                 "Actions": [
                     {
                         "Name": "SourceAction",
```

```
"ActionTypeId": {
                "Category": "Source",
                "Owner": "AWS",
                "Version": 1,
                "Provider": "S3"
            },
            "OutputArtifacts": [
                {
                     "Name": "SourceOutput"
                }
            ],
            "Configuration": {
                "S3Bucket": {
                     "Ref": "SourceBucket"
                },
                "S3ObjectKey": {
                     "Ref": "SourceObjectKey"
                },
                "PollForSourceChanges": false
            },
            "RunOrder": 1
        }
    ]
},
{
    "Name": "Beta",
    "Actions": [
        {
            "Name": "BetaAction",
            "InputArtifacts": [
                {
                     "Name": "SourceOutput"
                }
            ],
            "ActionTypeId": {
                "Category": "Deploy",
                "Owner": "AWS",
                "Version": 1,
                "Provider": "CodeDeploy"
            },
            "Configuration": {
                "ApplicationName": {
                     "Ref": "ApplicationName"
                },
```

```
"DeploymentGroupName": {
                                 "Ref": "BetaFleet"
                             }
                         },
                         "RunOrder": 1
                    }
                ]
            }
        ],
        "ArtifactStore": {
            "Type": "S3",
            "Location": {
                "Ref": "CodePipelineArtifactStoreBucket"
            }
        }
    }
},
"EventRole": {
    "Type": "AWS::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                {
                    "Effect": "Allow",
                    "Principal": {
                         "Service": [
                             "events.amazonaws.com"
                         ]
                    },
                    "Action": "sts:AssumeRole"
                }
            ]
        },
        "Path": "/",
        "Policies": [
            {
                "PolicyName": "eb-pipeline-execution",
                "PolicyDocument": {
                     "Version": "2012-10-17",
                    "Statement": [
                         {
                             "Effect": "Allow",
                             "Action": "codepipeline:StartPipelineExecution",
```

```
"Resource": {
                                  "Fn::Join": [
                                      "",
                                      Ε
                                          "arn:aws:codepipeline:",
                                          {
                                              "Ref": "AWS::Region"
                                          },
                                          ":",
                                          {
                                              "Ref": "AWS::AccountId"
                                          },
                                          ":",
                                          {
                                              "Ref": "AppPipeline"
                                          }
                                      ]
                                 ]
                             }
                         }
                     ]
                }
            }
        ]
    }
},
"EventRule": {
    "Type": "AWS::Events::Rule",
    "Properties": {
        "EventBusName": "default",
  "EventPattern": {
      "source": [
    "aws.s3"
  ],
        "detail-type": [
"Object Created"
  ],
  "detail": {
"bucket": {
                  "name": [
                      {
                      "Ref": "SourceBucket"
                      }
```



Connecting to Amazon S3 source actions that use EventBridge and Amazon CloudTrail

The instructions in this section provide the steps for creating the S3 source action that uses Amazon CloudTrail resources that you must create and manage. To use the S3 source action with EventBridge that does not require additional Amazon CloudTrail resources, use the CLI instructions at Migrate polling pipelines with an S3 source enabled for events.

🔥 Important

This procedure provides the steps for creating the S3 source action that uses Amazon CloudTrail resources that you must create and manage. The procedure to create this action without Amazon CloudTrail resources is not available in the console. To use the CLI, see Migrate polling pipelines with an S3 source enabled for events.

To add an Amazon S3 source action in CodePipeline, you choose either to:

- Use the CodePipeline console Create pipeline wizard (Create a custom pipeline (console)) or Edit action page to choose the S3 provider option. The console creates an EventBridge rule and a CloudTrail trail that starts your pipeline when the source changes.
- Use the Amazon CLI to add the action configuration for the S3 action and create additional resources as follows:
 - Use the S3 example action configuration in <u>Amazon S3 source action reference</u> to create your action as shown in <u>Create a pipeline (CLI)</u>.
 - The change detection method defaults to starting the pipeline by polling the source. You should disable periodic checks and create the change detection rule and trail manually. Use one of the following methods: <u>Create an EventBridge rule for an Amazon S3 source (console)</u>, <u>Create an EventBridge rule for an Amazon S3 source (CLI)</u>, or <u>Create an EventBridge rule for an Amazon S3 source (Amazon CloudFormation template</u>).

Amazon CloudTrail is a service that logs and filters events on your Amazon S3 source bucket. The trail sends the filtered source changes to the EventBridge rule. The EventBridge rule detects the source change and then starts your pipeline.

Requirements:

- If you are not creating a trail, use an existing Amazon CloudTrail trail for logging events in your Amazon S3 source bucket and sending filtered events to the EventBridge rule.
- Create or use an existing S3 bucket where Amazon CloudTrail can store its log files. Amazon CloudTrail must have the permissions required to deliver log files to an Amazon S3 bucket. The bucket cannot be configured as a <u>Requester Pays</u> bucket. When you create an Amazon S3 bucket as part of creating or updating a trail in the console, Amazon CloudTrail attaches the required permissions to a bucket for you. For more information, see <u>Amazon S3 Bucket Policy for CloudTrail</u>.

Create an EventBridge rule for an Amazon S3 source (console)

Before you set up a rule in EventBridge, you must create an Amazon CloudTrail trail. For more information, see Creating a Trail in the Console.

🔥 Important

If you use the console to create or edit your pipeline, your EventBridge rule and Amazon CloudTrail trail are created for you.

To create a trail

- 1. Open the Amazon CloudTrail console.
- 2. In the navigation pane, choose **Trails**.
- 3. Choose **Create trail**. For **Trail name**, enter a name for your trail.
- 4. Under **Storage location**, create or specify the bucket to be used to store the log files. By default, Amazon S3 buckets and objects are private. Only the resource owner (the Amazon account that created the bucket) can access the bucket and its objects. The bucket must have a resource policy that allows Amazon CloudTrail permissions to access the objects in the bucket.
- 5. Under Trail log bucket and folder, specify an Amazon S3 bucket and the object prefix (folder name) to log data events for all objects in the folder. For each trail, you can add up to 250 Amazon S3 objects. Complete the required encryption key information and choose Next.
- 6. For **Event type**, choose **Management events**.
- 7. For **Management events**, choose **Write**. The trail records Amazon S3 object-level API activity (for example, GetObject and PutObject) on the specified bucket and prefix.
- 8. Choose Write.

9. If you're satisfied with the trail, choose **Create trail**.

To create an EventBridge rule that targets your pipeline with an Amazon S3 source

- 1. Open the Amazon EventBridge console at https://console.amazonaws.cn/events/.
- In the navigation pane, choose Rules. Leave the default bus selected or choose an event bus. Choose Create rule.
- 3. In **Name**, enter a name for your rule.
- 4. Under **Rule type**, choose **Rule with an event pattern**. Choose **Next**.
- 5. Under Event source, choose Amazon events or EventBridge partner events.
- 6. Under Sample event type, choose Amazon events.
- 7. In Sample events, type S3 as the keyword to filter on. Choose Amazon API call via CloudTrail.
- 8. Under Creation method, choose Customer pattern (JSON editor).

Paste the event pattern provided below. Make sure to add the bucket name and S3 object key (or key name) which uniquely identifies the object in the bucket as requestParameters. In this example, a rule is created for a bucket named amzn-s3-demo-source-bucket and an object key of my-files.zip. When you use the **Edit** window to specify resources, your rule is updated to use a custom event pattern.

The following is a sample event pattern to copy and paste:

```
{
    "source": [
        "aws.s3"
    ],
    "detail-type": [
        "AWS API Call via CloudTrail"
    ],
    "detail": {
        "eventSource": [
            "s3.amazonaws.com"
        ],
        "eventName": [
            "CopyObject",
            "CompleteMultipartUpload",
            "PutObject"
        ],
        "requestParameters": {
```

- 9. Choose Next.
- 10. In Target types, choose Amazon service.
- 11. In **Select a target**, choose **CodePipeline**. In **Pipeline ARN**, enter the pipeline ARN for the pipeline to be started by this rule.

🚯 Note

To get the pipeline ARN, run the **get-pipeline** command. The pipeline ARN appears in the output. It is constructed in this format: arn:aws:codepipeline:*region:account:pipeline-name* Sample pipeline ARN: arn:aws:codepipeline:us-east-2:80398EXAMPLE:MyFirstPipeline

- 12. To create or specify an IAM service role that grants EventBridge permissions to invoke the target associated with your EventBridge rule (in this case, the target is CodePipeline):
 - Choose **Create a new role for this specific resource** to create a service role that gives EventBridge permissions to your start your pipeline executions.
 - Choose **Use existing role** to enter a service role that gives EventBridge permissions to your start your pipeline executions.
- 13. (Optional) To specify source overrides with a specific image ID, use the input transformer to pass the data as a JSON parameters. You can also use the input transformer to pass pipeline variables.
 - Expand Additional settings.

Under Configure target input, choose Configure input transformer.

In the dialog window, choose **Enter my own**. In the **Input path** box, type the following keyvalue pairs.

```
{"revisionValue": "$.detail.object.version-id"}
```

• In the **Template** box, type the following key-value pairs.

```
{
  "sourceRevisions": [
    {
        "actionName": "Source",
        "revisionType": "S3_OBJECT_VERSION_ID",
        "revisionValue": "<revisionValue>"
    }
],
    "variables": [
    {
        "name": "Variable_Name",
        "value": "Variable_Value"
    }
]
```

- Choose Confirm.
- 14. Choose Next.
- 15. On the **Tags** page, choose **Next**.
- 16. On the **Review and create** page, review the rule configuration. If you're satisfied with the rule, choose **Create rule**.

Create an EventBridge rule for an Amazon S3 source (CLI)

To create an Amazon CloudTrail trail and enable logging

To use the Amazon CLI to create a trail, call the **create-trail** command, specifying:

• The trail name.

• The bucket to which you have already applied the bucket policy for Amazon CloudTrail.

For more information, see Creating a trail with the Amazon command line interface.

1. Call the **create-trail** command and include the --name and --s3-bucket-name parameters.

Why am I making this change? This creates the CloudTrail trail required for your S3 source bucket.

The following command uses --name and --s3-bucket-name to create a trail named mytrail and a bucket named amzn-s3-demo-source-bucket.

```
aws cloudtrail create-trail --name my-trail --s3-bucket-name amzn-s3-demo-source-
bucket
```

2. Call the **start-logging** command and include the --name parameter.

Why am I making this change? This command starts the CloudTrail logging for your source bucket and sends events to EventBridge.

Example:

The following command uses --name to start logging on a trail named my-trail.

aws cloudtrail start-logging --name my-trail

3. Call the **put-event-selectors** command and include the --trail-name and --eventselectors parameters. Use event selectors to specify that you want your trail to log data events for your source bucket and send the events to the EventBridge rule.

Why am I making this change? This command filters events.

Example:

The following command uses --trail-name and --event-selectors to specify data events for a source bucket and prefix named amzn-s3-demo-source-bucket/myFolder.

```
aws cloudtrail put-event-selectors --trail-name my-trail --event-selectors
    '[{ "ReadWriteType": "WriteOnly", "IncludeManagementEvents":false,
```

```
User Guide
```

```
"DataResources": [{ "Type": "AWS::S3::Object", "Values": ["arn:aws:s3:::amzn-s3-
demo-source-bucket/myFolder/file.zip"] }] }]'
```

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. Grant permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see Using resource-based policies for Amazon EventBridge.
 - a. Use the following sample to create the trust policy to allow EventBridge to assume the service role. Name it trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
        },
        "Action": "sts:AssumeRole"
        }
   ]
}
```

b. Use the following command to create the Role-for-MyRule role and attach the trust policy.

Why am I making this change? Adding this trust policy to the role creates permissions for EventBridge.

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown here for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
"Effect": "Allow",
    "Action": [
        "codepipeline:StartPipelineExecution"
    ],
    "Resource": [
        "arn:aws:codepipeline:us-west-2:80398EXAMPLE:MyFirstPipeline"
    ]
    }
}
```

d. Use the following command to attach the new CodePipeline-Permissions-Policyfor-EB permissions policy to the Role-for-MyRule role you created.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

 Call the put-rule command and include the --name, --event-pattern, and --role-arn parameters.

The following sample command creates a rule named MyS3SourceRule.

```
aws events put-rule --name "MyS3SourceRule" --event-pattern "{\"source\":
[\"aws.s3\"],\"detail-type\":[\"AWS API Call via CloudTrail\"],\"detail\":
{\"eventSource\":[\"s3.amazonaws.com\"],\"eventName\":[\"CopyObject\",\"PutObject
\",\"CompleteMultipartUpload\"],\"requestParameters\":{\"bucketName\":[\"amzn-s3-
demo-source-bucket\"],\"key\":[\"my-key\"]}}
--role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-for-MyRule"
```

3. To add CodePipeline as a target, call the **put-targets** command and include the --rule and --targets parameters.

The following command specifies that for the rule named MyS3SourceRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule MyS3SourceRule --targets
Id=1,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following JSON in your CLI command. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, S3_OBJECT_VERSION_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
{
    "Rule": "my-rule",
    "Targets": [
        {
            "Id": "MyTargetId",
            "Arn": "ARN",
            "InputTransformer": {
                "InputPathsMap": {
                     "revisionValue": "$.detail.object.version-id"
                },
                "InputTemplate": {
                     "sourceRevisions": {
                         "actionName": "Source",
                         "revisionType": "S3_OBJECT_VERSION_ID",
                         "revisionValue": "<revisionValue>"
                     }
                }
            }
        }
    ]
}
```

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change

detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

1. Run the **get-pipeline** command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

```
aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json
```

This command returns nothing, but the file you created should appear in the directory where you ran the command.

 Open the JSON file in any plain-text editor and edit the source stage by changing the PollForSourceChanges parameter for a bucket named amzn-s3-demo-source-bucket to false, as shown in this example.

Why am I making this change? Setting this parameter to false turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "S3Bucket": "amzn-s3-demo-source-bucket",
    "PollForSourceChanges": "false",
    "S3ObjectKey": "index.zip"
},
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, you must remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
},
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

Create an EventBridge rule for an Amazon S3 source (Amazon CloudFormation template)

To use Amazon CloudFormation to create a rule, update your template as shown here.

To create an EventBridge rule with Amazon S3 as the event source and CodePipeline as the target and apply the permissions policy

- 1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:
 - The first policy allows the role to be assumed.
 - The second policy provides permissions to start the pipeline.

Why am I making this change? Adding AWS:::IAM::Role resource enables Amazon CloudFormation to create permissions for EventBridge. This resource is added to your Amazon CloudFormation stack.

YAML

```
User Guide
```

```
EventRole:
   Type: AWS::IAM::Role
   Properties:
     AssumeRolePolicyDocument:
       Version: 2012-10-17
       Statement:
            Effect: Allow
            Principal:
              Service:
                - events.amazonaws.com
            Action: sts:AssumeRole
     Path: /
     Policies:
         PolicyName: eb-pipeline-execution
         PolicyDocument:
            Version: 2012-10-17
            Statement:
                Effect: Allow
                Action: codepipeline:StartPipelineExecution
                Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref
'AWS::Region', ':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
. . .
```

```
"EventRole": {
    "Type": "AWS::IAM::Role",
    "Properties": {
        "AssumeRolePolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
            {
               "Effect": "Allow",
               "Principal": {
                "Service": [
```

```
"events.amazonaws.com"
              ]
            },
            "Action": "sts:AssumeRole"
          }
        ]
      },
      "Path": "/",
      "Policies": [
        {
          "PolicyName": "eb-pipeline-execution",
          "PolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
              {
                 "Effect": "Allow",
                 "Action": "codepipeline:StartPipelineExecution",
                 "Resource": {
                   "Fn::Join": [
                     "",
                     Ε
                       "arn:aws:codepipeline:",
                       {
                         "Ref": "AWS::Region"
                       },
                       ":",
                       {
                         "Ref": "AWS::AccountId"
                       },
                       ":",
                       {
                         "Ref": "AppPipeline"
                       }
                     ]
                   ]
. . .
```

2. Use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule. This event pattern creates an event that monitors CopyObject, PutObject and CompleteMultipartUpload on your Amazon S3 source bucket. In addition, include a target of your pipeline. When CopyObject, PutObject, or CompleteMultipartUpload occurs, this rule invokes StartPipelineExecution on your target pipeline. Why am I making this change? Adding the AWS::Events::Rule resource enables Amazon CloudFormation to create the event. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRule:
   Type: AWS::Events::Rule
    Properties:
     EventPattern:
        source:
          - aws.s3
        detail-type:
          - 'AWS API Call via CloudTrail'
        detail:
          eventSource:
            - s3.amazonaws.com
          eventName:
            - CopyObject
            - PutObject
            - CompleteMultipartUpload
          requestParameters:
            bucketName:
              - !Ref SourceBucket
            key:
              - !Ref SourceObjectKey
     Targets:
          Arn:
            !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref AppPipeline ] ]
          RoleArn: !GetAtt EventRole.Arn
          Id: codepipeline-AppPipeline
. . .
```

```
"EventRule": {
    "Type": "AWS::Events::Rule",
```

```
"Properties": {
  "EventPattern": {
    "source": [
      "aws.s3"
    ],
    "detail-type": [
      "AWS API Call via CloudTrail"
    ],
    "detail": {
      "eventSource": [
        "s3.amazonaws.com"
      ],
      "eventName": [
        "CopyObject",
        "PutObject",
        "CompleteMultipartUpload"
      ],
      "requestParameters": {
        "bucketName": [
          {
            "Ref": "SourceBucket"
          }
        ],
        "key": [
          {
            "Ref": "SourceObjectKey"
          }
        ]
      }
    }
 },
  "Targets": [
   {
      "Arn": {
        "Fn::Join": [
          "",
          Γ
            "arn:aws:codepipeline:",
            {
              "Ref": "AWS::Region"
            },
            ":",
            {
              "Ref": "AWS::AccountId"
```



3. Add this snippet to your first template to allow cross-stack functionality:

YAML

```
Outputs:
SourceBucketARN:
Description: "S3 bucket ARN that Cloudtrail will use"
Value: !GetAtt SourceBucket.Arn
Export:
Name: SourceBucketARN
```

```
"Outputs" : {
   "SourceBucketARN" : {
    "Description" : "S3 bucket ARN that Cloudtrail will use",
    "Value" : { "Fn::GetAtt": ["SourceBucket", "Arn"] },
    "Export" : {
        "Name" : "SourceBucketARN"
    }
```

```
}
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following YAML snippet. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, S3_OBJECT_VERSION_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
----
Rule: my-rule
Targets:
- Id: MyTargetId
Arn: pipeline-ARN
InputTransformer:
InputPathsMap:
revisionValue: "$.detail.object.version-id"
InputTemplate:
sourceRevisions:
actionName: Source
revisionType: S3_OBJECT_VERSION_ID
revisionValue: '<revisionValue>'
```

- 5. Save your updated template to your local computer, and open the Amazon CloudFormation console.
- 6. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 7. Upload your updated template, and then view the changes listed in Amazon CloudFormation. These are the changes that will be made to the stack. You should see your new resources in the list.
- 8. Choose **Execute**.

To edit your pipeline's PollForSourceChanges parameter

<u> Important</u>

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing PollForSourceChanges to false turns off periodic checks so you can use event-based change detection only.

YAML

```
Name: Source
Actions:
-
Name: SourceAction
ActionTypeId:
Category: Source
Owner: AWS
Version: 1
Provider: S3
OutputArtifacts:
- Name: SourceOutput
Configuration:
S3Bucket: !Ref SourceBucket
S3ObjectKey: !Ref SourceObjectKey
PollForSourceChanges: false
RunOrder: 1
```

JSON

{

"Name": "SourceAction", "ActionTypeId": {

```
"Category": "Source",
    "Owner": "AWS",
    "Version": 1,
    "Provider": "S3"
 },
  "OutputArtifacts": [
    {
      "Name": "SourceOutput"
    }
  ],
  "Configuration": {
    "S3Bucket": {
      "Ref": "SourceBucket"
    },
    "S3ObjectKey": {
      "Ref": "SourceObjectKey"
    },
    "PollForSourceChanges": false
 },
  "RunOrder": 1
}
```

To create a second template for your Amazon S3 pipeline's CloudTrail resources

 In a separate template, under Resources, use the AWS::S3::Bucket, AWS::S3::BucketPolicy, and AWS::CloudTrail::Trail Amazon CloudFormation resources to provide a simple bucket definition and trail for CloudTrail.

Why am I making this change? Given the current limit of five trails per account, the CloudTrail trail must be created and managed separately. (See <u>Limits in Amazon CloudTrail</u>.) However, you can include many Amazon S3 buckets on a single trail, so you can create the trail once and then add Amazon S3 buckets for other pipelines as necessary. Paste the following into your second sample template file.

YAML

```
Parameters:
  SourceObjectKey:
    Description: 'S3 source artifact'
   Type: String
    Default: SampleApp_Linux.zip
Resources:
  AWSCloudTrailBucketPolicy:
    Type: AWS::S3::BucketPolicy
    Properties:
      Bucket: !Ref AWSCloudTrailBucket
      PolicyDocument:
        Version: 2012-10-17
        Statement:
            Sid: AWSCloudTrailAclCheck
            Effect: Allow
            Principal:
              Service:
                - cloudtrail.amazonaws.com
            Action: s3:GetBucketAcl
            Resource: !GetAtt AWSCloudTrailBucket.Arn
            Sid: AWSCloudTrailWrite
            Effect: Allow
            Principal:
              Service:
                - cloudtrail.amazonaws.com
            Action: s3:PutObject
            Resource: !Join [ '', [ !GetAtt AWSCloudTrailBucket.Arn, '/
AWSLogs/', !Ref 'AWS::AccountId', '/*' ] ]
            Condition:
              StringEquals:
                s3:x-amz-acl: bucket-owner-full-control
 AWSCloudTrailBucket:
    Type: AWS::S3::Bucket
    DeletionPolicy: Retain
 AwsCloudTrail:
    DependsOn:
      - AWSCloudTrailBucketPolicy
    Type: AWS::CloudTrail::Trail
    Properties:
      S3BucketName: !Ref AWSCloudTrailBucket
```

```
EventSelectors:

DataResources:

Type: AWS::S3::Object

Values:

- !Join [ '', [ !ImportValue SourceBucketARN, '/', !Ref
SourceObjectKey ] ]

ReadWriteType: WriteOnly

IncludeManagementEvents: false

IncludeGlobalServiceEvents: true

IsLogging: true

IsMultiRegionTrail: true
```

```
{
  "Parameters": {
    "SourceObjectKey": {
      "Description": "S3 source artifact",
      "Type": "String",
      "Default": "SampleApp_Linux.zip"
    }
  },
  "Resources": {
    "AWSCloudTrailBucket": {
      "Type": "AWS::S3::Bucket",
        "DeletionPolicy": "Retain"
    },
    "AWSCloudTrailBucketPolicy": {
      "Type": "AWS::S3::BucketPolicy",
      "Properties": {
        "Bucket": {
          "Ref": "AWSCloudTrailBucket"
        },
        "PolicyDocument": {
          "Version": "2012-10-17",
          "Statement": [
            {
              "Sid": "AWSCloudTrailAclCheck",
```

```
"Effect": "Allow",
  "Principal": {
    "Service": [
      "cloudtrail.amazonaws.com"
    ]
  },
  "Action": "s3:GetBucketAcl",
  "Resource": {
    "Fn::GetAtt": [
      "AWSCloudTrailBucket",
      "Arn"
    ]
  }
},
{
  "Sid": "AWSCloudTrailWrite",
  "Effect": "Allow",
  "Principal": {
    "Service": [
      "cloudtrail.amazonaws.com"
    ]
 },
  "Action": "s3:PutObject",
  "Resource": {
    "Fn::Join": [
      "",
      Γ
        {
          "Fn::GetAtt": [
            "AWSCloudTrailBucket",
            "Arn"
          ]
        },
        "/AWSLogs/",
        {
          "Ref": "AWS::AccountId"
        },
        "/*"
      ]
    ]
  },
  "Condition": {
    "StringEquals": {
      "s3:x-amz-acl": "bucket-owner-full-control"
```

```
}
          }
        }
      ]
    }
 }
},
"AwsCloudTrail": {
  "DependsOn": [
    "AWSCloudTrailBucketPolicy"
  ],
  "Type": "AWS::CloudTrail::Trail",
  "Properties": {
    "S3BucketName": {
      "Ref": "AWSCloudTrailBucket"
    },
    "EventSelectors": [
      {
        "DataResources": [
          {
            "Type": "AWS::S3::Object",
            "Values": [
              {
                "Fn::Join": [
                  "",
                   Γ
                     {
                       "Fn::ImportValue": "SourceBucketARN"
                     },
                     "/",
                     {
                       "Ref": "SourceObjectKey"
                     }
                  ]
                ]
              }
            ]
          }
        ],
        "ReadWriteType": "WriteOnly",
        "IncludeManagementEvents": false
      }
    ],
    "IncludeGlobalServiceEvents": true,
```

```
"IsLogging": true,
"IsMultiRegionTrail": true
}
}
}
```

CodeCommit source actions and EventBridge

To add a CodeCommit source action in CodePipeline, you can choose either to:

- Use the CodePipeline console Create pipeline wizard (<u>Create a custom pipeline (console</u>)) or Edit action page to choose the CodeCommit provider option. The console creates an EventBridge rule that starts your pipeline when the source changes.
- Use the Amazon CLI to add the action configuration for the CodeCommit action and create additional resources as follows:
 - Use the CodeCommit example action configuration in <u>CodeCommit source action reference</u> to create your action as shown in Create a pipeline (CLI).
 - The change detection method defaults to starting the pipeline by polling the source. You should disable periodic checks and create the change detection rule manually. Use one of the following methods: <u>Create an EventBridge rule for a CodeCommit source (console)</u>, <u>Create an EventBridge rule for a CodeCommit source (CLI)</u>, or <u>Create an EventBridge rule for a CodeCommit source (Amazon CloudFormation template)</u>.

Topics

- Create an EventBridge rule for a CodeCommit source (console)
- Create an EventBridge rule for a CodeCommit source (CLI)
- Create an EventBridge rule for a CodeCommit source (Amazon CloudFormation template)

Create an EventBridge rule for a CodeCommit source (console)

🔥 Important

If you use the console to create or edit your pipeline, your EventBridge rule is created for you.

To create an EventBridge rule for use in CodePipeline operations

- 1. Open the Amazon EventBridge console at https://console.amazonaws.cn/events/.
- 2. In the navigation pane, choose **Rules**. Leave the default bus selected or choose an event bus. Choose **Create rule**.
- 3. In Name, enter a name for your rule.
- 4. Under Rule type, choose Rule with an event pattern. Choose Next.
- 5. Under Event source, choose Amazon events or EventBridge partner events.
- 6. Under Sample event type, choose Amazon events.
- 7. In **Sample events**, type CodeCommit as the keyword to filter on. Choose **CodeCommit Repository State Change**.
- 8. Under Creation method, choose Customer pattern (JSON editor).

Paste the event pattern provided below. The following is a sample CodeCommit event pattern in the **Event** window for a MyTestRepo repository with a branch named main:

```
{
   "source": [
    "aws.codecommit"
],
   "detail-type": [
    "CodeCommit Repository State Change"
],
   "resources": [
    "arn:aws:codecommit:us-west-2:80398EXAMPLE:MyTestRepo"
],
   "detail": {
    "referenceType": [
    "branch"
```

}

```
],
"referenceName": [
"main"
]
}
```

- 9. In **Targets**, choose **CodePipeline**.
- 10. Enter the pipeline ARN for the pipeline to be started by this rule.

🚺 Note

You can find the pipeline ARN in the metadata output after you run the **get-pipeline** command. The pipeline ARN is constructed in this format: arn:aws:codepipeline:*region:account:pipeline-name* Sample pipeline ARN: arn:aws:codepipeline:us-east-2:80398EXAMPLE:MyFirstPipeline

- 11. To create or specify an IAM service role that grants EventBridge permissions to invoke the target associated with your EventBridge rule (in this case, the target is CodePipeline):
 - Choose **Create a new role for this specific resource** to create a service role that gives EventBridge permissions to your start your pipeline executions.
 - Choose **Use existing role** to enter a service role that gives EventBridge permissions to your start your pipeline executions.
- 12. (Optional) To specify source overrides with a specific image ID, use the input transformer to pass the data as a JSON parameters. You can also use the input transformer to pass pipeline variables.
 - Expand Additional settings.

Under Configure target input, choose Configure input transformer.

In the dialog window, choose **Enter my own**. In the **Input path** box, type the following keyvalue pairs.

{"revisionValue": "\$.detail.image-digest"}

• In the **Template** box, type the following key-value pairs.

```
{
    "sourceRevisions": [
        {
            "actionName": "Source",
            "revisionType": "COMMIT_ID",
            "revisionValue": "<revisionValue>"
        }
    ],
    "variables": [
        {
            "name": "Branch_Name",
            "value": "value"
        }
    ]
}
```

- Choose Confirm.
- 13. Choose Next.
- 14. On the Tags page, choose Next.
- 15. On the **Review and create** page, review the rule configuration. If you're satisfied with the rule, choose **Create rule**.

Create an EventBridge rule for a CodeCommit source (CLI)

Call the **put-rule** command, specifying:

- A name that uniquely identifies the rule you are creating. This name must be unique across all of the pipelines you create with CodePipeline associated with your Amazon account.
- The event pattern for the source and detail fields used by the rule. For more information, see Amazon EventBridge and Event Patterns.

To create an EventBridge rule with CodeCommit as the event source and CodePipeline as the target

1. Add permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see Using resource-based policies for Amazon EventBridge.

a. Use the following sample to create the trust policy that allows EventBridge to assume the service role. Name the trust policy trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
        },
        "Action": "sts:AssumeRole"
        }
    ]
}
```

b. Use the following command to create the Role-for-MyRule role and attach the trust policy.

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON, as shown in this sample, for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

d. Use the following command to attach the CodePipeline-Permissions-Policy-for-EB permissions policy to the Role-for-MyRule role.

Why am I making this change? Adding this policy to the role creates permissions for EventBridge.

```
aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-
Permissions-Policy-For-EB --policy-document file://permissionspolicyforEB.json
```

2. Call the **put-rule** command and include the --name, --event-pattern, and--role-arn parameters.

Why am I making this change? This command enables Amazon CloudFormation to create the event.

The following sample command creates a rule called MyCodeCommitRepoRule.

```
aws events put-rule --name "MyCodeCommitRepoRule" --event-pattern "{\"source\":
[\"aws.codecommit\"],\"detail-type\":[\"CodeCommit Repository State Change\"],
\"resources\":[\"repository-ARN\"],\"detail\":{\"referenceType\":[\"branch\"],
\"referenceName\":[\"main\"]}}" --role-arn "arn:aws:iam::ACCOUNT_ID:role/Role-for-
MyRule"
```

- 3. To add CodePipeline as a target, call the **put-targets** command and include the following parameters:
 - The --rule parameter is used with the rule_name you created by using **put-rule**.
 - The --targets parameter is used with the list Id of the target in the list of targets and the ARN of the target pipeline.

The following sample command specifies that for the rule called MyCodeCommitRepoRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The sample command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule MyCodeCommitRepoRule --targets
Id=1,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline
```

- 4. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following JSON in your CLI command. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, COMMIT_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.

```
{
    "Rule": "my-rule",
    "Targets": [
        {
            "Id": "MyTargetId",
            "Arn": "pipeline-ARN",
            "InputTransformer": {
                "sourceRevisions": {
                     "actionName": "Source",
                     "revisionType": "COMMIT_ID",
                     "revisionValue": "<revisionValue>"
                },
                "variables": [
                     {
                         "name": "Branch_Name",
                         "value": "value"
                     }
                ]
            }
        }
    ]
}
```

To edit your pipeline's PollForSourceChanges parameter

▲ Important

When you create a pipeline with this method, the PollForSourceChanges parameter defaults to true if it is not explicitly set to false. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid</u> settings for the PollForSourceChanges parameter.

 Run the get-pipeline command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

```
aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json
```

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Open the JSON file in any plain-text editor and edit the source stage by changing the PollForSourceChanges parameter to false, as shown in this example.

Why am I making this change? Changing this parameter to false turns off periodic checks so you can use event-based change detection only.

```
"configuration": {
    "PollForSourceChanges": "false",
    "BranchName": "main",
    "RepositoryName": "MyTestRepo"
},
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
```

},

```
"created": "date",
"updated": "date"
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

Create an EventBridge rule for a CodeCommit source (Amazon CloudFormation template)

To use Amazon CloudFormation to create a rule, update your template as shown here.

To update your pipeline Amazon CloudFormation template and create EventBridge rule

- 1. In the template, under Resources, use the AWS::IAM::Role Amazon CloudFormation resource to configure the IAM role that allows your event to start your pipeline. This entry creates a role that uses two policies:
 - The first policy allows the role to be assumed.
 - The second policy provides permissions to start the pipeline.

Why am I making this change? Adding the AWS:::IAM::Role resource enables Amazon CloudFormation to create permissions for EventBridge. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRole:
  Type: AWS::IAM::Role
  Properties:
    AssumeRolePolicyDocument:
      Version: 2012-10-17
      Statement:
           Effect: Allow
           Principal:
             Service:
               - events.amazonaws.com
           Action: sts:AssumeRole
    Path: /
    Policies:
         PolicyName: eb-pipeline-execution
         PolicyDocument:
           Version: 2012-10-17
           Statement:
               Effect: Allow
               Action: codepipeline:StartPipelineExecution
               Resource: !Join [ '', [ 'arn:aws:codepipeline:', !Ref
'AWS::Region', ':', !Ref 'AWS::AccountId', ':', !Ref AppPipeline ] ]
```

```
"EventRole": {
   "Type": "AWS::IAM::Role",
   "Properties": {
      "AssumeRolePolicyDocument": {
        "Version": "2012-10-17",
        "Statement": [
           {
                "Effect": "Allow",
```

```
"Principal": {
            "Service": [
              "events.amazonaws.com"
            ]
          },
          "Action": "sts:AssumeRole"
        }
      ]
    },
    "Path": "/",
    "Policies": [
      {
        "PolicyName": "eb-pipeline-execution",
        "PolicyDocument": {
          "Version": "2012-10-17",
          "Statement": [
            {
              "Effect": "Allow",
              "Action": "codepipeline:StartPipelineExecution",
              "Resource": {
                 "Fn::Join": [
                   "",
                   Ε
                     "arn:aws:codepipeline:",
                     {
                       "Ref": "AWS::Region"
                     },
                     ":",
                     {
                       "Ref": "AWS::AccountId"
                     },
                     ":",
                     {
                       "Ref": "AppPipeline"
                     }
                   ]
. . .
```

2. In the template, under Resources, use the AWS::Events::Rule Amazon CloudFormation resource to add an EventBridge rule. This event pattern creates an event that monitors push changes to your repository. When EventBridge detects a repository state change, the rule invokes StartPipelineExecution on your target pipeline.

Why am I making this change? Adding the AWS::Events::Rule resource enables Amazon CloudFormation to create the event. This resource is added to your Amazon CloudFormation stack.

YAML

```
EventRule:
  Type: AWS::Events::Rule
  Properties:
     EventPattern:
       source:
         - aws.codecommit
       detail-type:
         - 'CodeCommit Repository State Change'
       resources:
         - !Join [ '', [ 'arn:aws:codecommit:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref RepositoryName ] ]
       detail:
         event:
           - referenceCreated
           - referenceUpdated
         referenceType:
           - branch
         referenceName:
           - main
    Targets:
         Arn:
           !Join [ '', [ 'arn:aws:codepipeline:', !Ref 'AWS::Region', ':', !Ref
'AWS::AccountId', ':', !Ref AppPipeline ] ]
         RoleArn: !GetAtt EventRole.Arn
         Id: codepipeline-AppPipeline
```

```
"EventRule": {
   "Type": "AWS::Events::Rule",
   "Properties": {
      "EventPattern": {
        "source": [
           "aws.codecommit"
```

```
],
  "detail-type": [
    "CodeCommit Repository State Change"
  ],
  "resources": [
    {
      "Fn::Join": [
        "",
        Ε
          "arn:aws:codecommit:",
          {
            "Ref": "AWS::Region"
          },
          ":",
          {
            "Ref": "AWS::AccountId"
          },
          ":",
          {
            "Ref": "RepositoryName"
          }
        ]
      ]
    }
 ],
  "detail": {
    "event": [
      "referenceCreated",
      "referenceUpdated"
   ],
    "referenceType": [
      "branch"
    ],
    "referenceName": [
      "main"
    ]
 }
},
"Targets": [
 {
    "Arn": {
      "Fn::Join": [
        "",
        Ε
```

```
"arn:aws:codepipeline:",
               {
                 "Ref": "AWS::Region"
               },
               ":",
               {
                 "Ref": "AWS::AccountId"
               },
               ":",
               {
                 "Ref": "AppPipeline"
               }
             ]
           ]
        },
        "RoleArn": {
           "Fn::GetAtt": [
             "EventRole",
             "Arn"
           ]
        },
        "Id": "codepipeline-AppPipeline"
      }
    1
  }
},
```

- 3. (Optional) To configure an input transformer with source overrides for a specific image ID, use the following YAML snippet. The following example configures an override where:
 - The actionName, Source in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionType, COMMIT_ID in this example, is the dynamic value, defined at pipeline creation, not derived from the source event.
 - The revisionValue, <revisionValue> in this example, is derived from the source event variable.
 - The output variables for BranchName and Value are specified.

```
Rule: my-rule
Targets:
```

-	Id: MyTargetId
	Arn: pipeline-ARN
	InputTransformer:
	sourceRevisions:
	actionName: Source
	revisionType: COMMIT_ID
	revisionValue: < <u>revisionValue</u> >
	variables:
	- name: BranchName
	value: value

- 4. Save the updated template to your local computer, and then open the Amazon CloudFormation console.
- 5. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 6. Upload the template, and then view the changes listed in Amazon CloudFormation. These are the changes to be made to the stack. You should see your new resources in the list.
- 7. Choose **Execute**.

To edit your pipeline's PollForSourceChanges parameter

A Important

In many cases, the PollForSourceChanges parameter defaults to true when you create a pipeline. When you add event-based change detection, you must add the parameter to your output and set it to false to disable polling. Otherwise, your pipeline starts twice for a single source change. For details, see <u>Valid settings for the PollForSourceChanges</u> parameter.

• In the template, change PollForSourceChanges to false. If you did not include PollForSourceChanges in your pipeline definition, add it and set it to false.

Why am I making this change? Changing this parameter to false turns off periodic checks so you can use event-based change detection only.

YAML

Name: Source Actions:

Name: SourceAction ActionTypeId: Category: Source Owner: AWS Version: 1 Provider: CodeCommit OutputArtifacts: - Name: SourceOutput Configuration: BranchName: !Ref BranchName RepositoryName: !Ref RepositoryName *PollForSourceChanges: false* RunOrder: 1

```
{
  "Name": "Source",
  "Actions": [
    {
      "Name": "SourceAction",
      "ActionTypeId": {
        "Category": "Source",
        "Owner": "AWS",
        "Version": 1,
        "Provider": "CodeCommit"
      },
      "OutputArtifacts": [
        {
          "Name": "SourceOutput"
        }
      ],
      "Configuration": {
        "BranchName": {
          "Ref": "BranchName"
        },
        "RepositoryName": {
          "Ref": "RepositoryName"
        },
        "PollForSourceChanges": false
      },
      "RunOrder": 1
```



Add third-party source providers to pipelines using CodeConnections

You can use the Amazon CodePipeline console or the Amazon CLI to connect your pipeline to thirdparty repositories.

🚺 Note

When you use the console to create or edit a pipeline, the change detection resources are created for you. If you use the Amazon CLI to create the pipeline, you must create the additional resources yourself. For more information, see <u>CodeCommit source actions and EventBridge</u>.

Topics

- Bitbucket Cloud connections
- GitHub connections
- GitHub Enterprise Server connections
- <u>GitLab.com connections</u>
- Connections for GitLab self-managed
- Use a connection shared with another account

Bitbucket Cloud connections

Connections allow you to authorize and establish configurations that associate your third-party provider with your Amazon resources. To associate your third-party repository as a source for your pipeline, you use a connection.

🚯 Note

Instead of creating or using an existing connection in your account, you can use a shared connection between another Amazon Web Services account. See <u>Use a connection shared</u> with another account.

🚯 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> <u>with CodePipeline</u>.

To add a Bitbucket Cloud source action in CodePipeline, you can choose either to:

 Use the CodePipeline console Create pipeline wizard or Edit action page to choose the Bitbucket provider option. See <u>Create a connection to Bitbucket Cloud (console)</u> to add the action. The console helps you create a connections resource.

i Note

You can create connections to a Bitbucket Cloud repository. Installed Bitbucket provider types, such as Bitbucket Server, are not supported.

- Use the CLI to add the action configuration for the CreateSourceConnection action with the Bitbucket provider as follows:
 - To create your connections resources, see <u>Create a connection to Bitbucket Cloud (CLI)</u> to create a connections resource with the CLI.
 - Use the CreateSourceConnection example action configuration in <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed actions to add your action as shown in <u>Create a pipeline (CLI)</u>.

🚺 Note

You can also create a connection using the Developer Tools console under **Settings**. See <u>Create a Connection</u>.

Before you begin:

• You must have created an account with the provider of the third-party repository, such as Bitbucket Cloud.

• You must have already created a third-party code repository, such as a Bitbucket Cloud repository.

🚺 Note

Bitbucket Cloud connections only provide access to repositories owned by the Bitbucket Cloud account that was used to create the connection. If the application is being installed in a Bitbucket Cloud workspace, you need **Administer workspace** permissions. Otherwise, the option to install the app will not display.

Topics

- <u>Create a connection to Bitbucket Cloud (console)</u>
- Create a connection to Bitbucket Cloud (CLI)

Create a connection to Bitbucket Cloud (console)

Use these steps to use the CodePipeline console to add a connections action for your Bitbucket repository.

🚯 Note

You can create connections to a Bitbucket Cloud repository. Installed Bitbucket provider types, such as Bitbucket Server, are not supported.

Step 1: Create or edit your pipeline

To create or edit your pipeline

- 1. Sign in to the CodePipeline console.
- 2. Choose one of the following.
 - Choose to create a pipeline. Follow the steps in *Create a Pipeline* to complete the first screen and choose **Next**. On the **Source** page, under **Source Provider**, choose **Bitbucket**.

- Choose to edit an existing pipeline. Choose **Edit**, and then choose **Edit stage**. Choose to add or edit your source action. On the **Edit action** page, under **Action name**, enter the name for your action. In **Action provider**, choose **Bitbucket**.
- 3. Do one of the following:
 - Under Connection, if you have not already created a connection to your provider, choose
 Connect to Bitbucket. Proceed to Step 2: Create a Connection to Bitbucket.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to Step 3: Save the Source Action for Your Connection.

Step 2: Create a connection to Bitbucket Cloud

To create a connection to Bitbucket Cloud

 On the Connect to Bitbucket settings page, enter your connection name and choose Connect to Bitbucket.

Create Bitbucket connection	
Connection name	
	Connect to Bitbucket

The **Bitbucket apps** field appears.

2. Under **Bitbucket apps**, choose an app installation or choose **Install a new app** to create one.

NoteYou only install the app once for each Bitbuc

You only install the app once for each Bitbucket Cloud workspace or account. If you have already installed the Bitbucket app, choose it and move to step 4.

onnect to Bitbucket	
Bitbucket connection settings Inf	fo
Connection name	
a-connection	
Bitbucket apps Bitbucket apps create a link for your connection wit	th Bitbucket. To start, install a new app and save this connection.
Q	or Install a new app
	Connect

- 3. If the login page for Bitbucket Cloud displays, log in with your credentials and then choose to continue.
- 4. On the app installation page, a message shows that the AWS CodeStar app is trying to connect to your Bitbucket account.

If you are using a Bitbucket workspace, change the **Authorize for** option to the workspace. Only workspaces where you have administrator access will display.

Choose Grant access.

5. In **Bitbucket apps**, the connection ID for your new installation is displayed. Choose **Connect**. The created connection displays in the connections list.

itbucket connection se	ettings Info
onnection name	
MyConnection	
itbucket apps itbucket apps create a link for your Q ari:cloud:bitbucket::app/{	connection with Bitbucket. To start, install a new app and save this connection.

Step 3: Save your Bitbucket Cloud source action

Use these steps on the wizard or **Edit action** page to save your source action with your connection information.

To complete and save your source action with your connection

- 1. In **Repository name**, choose the name of your third-party repository.
- 2. Under **Pipeline triggers** you can add triggers if your action is an CodeConnections action. To configure the pipeline trigger configuration and to optionally filter with triggers, see more details in Add trigger with code push or pull request event types.
- 3. In **Output artifact format**, you must choose the format for your artifacts.
 - To store output artifacts from the Bitbucket Cloud action using the default method, choose
 CodePipeline default. The action accesses the files from the Bitbucket Cloud repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose **Full clone**. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Add CodeBuild GitClone permissions for connections to Bitbucket</u>, GitHub, GitHub Enterprise Server, or GitLab.com.

4. Choose **Next** on the wizard or **Save** on the **Edit action** page.

Create a connection to Bitbucket Cloud (CLI)

You can use the Amazon Command Line Interface (Amazon CLI) to create a connection.

i Note

You can create connections to a Bitbucket Cloud repository. Installed Bitbucket provider types, such as Bitbucket Server, are not supported.

To do this, use the **create-connection** command.

<u> Important</u>

A connection created through the Amazon CLI or Amazon CloudFormation is in PENDING status by default. After you create a connection with the CLI or Amazon CloudFormation, use the console to edit the connection to make its status AVAILABLE.

To create a connection

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-connection command, specifying the --provider-type and -connection-name for your connection. In this example, the third-party provider name is Bitbucket and the specified connection name is MyConnection.

```
aws codestar-connections create-connection --provider-type Bitbucket --connection-
name MyConnection
```

If successful, this command returns the connection ARN information similar to the following.

```
{
    "ConnectionArn": "arn:aws:codestar-connections:us-west-2:account_id:connection/
aEXAMPLE-8aad-4d5d-8878-dfcab0bc441f"
}
```

- 2. Use the console to complete the connection. For more information, see <u>Update a pending</u> <u>connection</u>.
- 3. The pipeline defaults to detect changes on code push to the connection source repository. To configure the pipeline trigger configuration for manual release or for Git tags, do one of the following:
 - To configure the pipeline trigger configuration to start with a manual release only, add the following line to the configuration:

```
"DetectChanges": "false",
```

 To configure the pipeline trigger configuration to filter with triggers, see more details in <u>Add trigger with code push or pull request event types</u>. For example, the following adds Git tags to the pipeline level of the pipeline JSON definition. In this example, release-v0 and release-v1 are the Git tags to include, and release-v2 is the Git tag to exclude.

```
"triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
                     "sourceActionName": "Source",
                     "push": [
                         {
                             "tags": {
                                 "includes": [
                                      "release-v0", "release-v1"
                                 ],
                                 "excludes": [
                                      "release-v2"
                                 ]
                             }
                         }
                     ]
                }
            }
        ]
```

GitHub connections

You use connections to authorize and establish configurations that associate your third-party provider with your Amazon resources.

🚯 Note

Instead of creating or using an existing connection in your account, you can use a shared connection between another Amazon Web Services account. See <u>Use a connection shared</u> with another account.

🚯 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

To add a source action for your GitHub or GitHub Enterprise Cloud repository in CodePipeline, you can choose either to:

 Use the CodePipeline console Create pipeline wizard or Edit action page to choose the GitHub (via GitHub App) provider option. See Create a connection to GitHub Enterprise Server (console) to add the action. The console helps you create a connections resource.

1 Note

For a tutorial that walks you through how to add a GitHub connection and use the **Full clone** option in your pipeline to clone metadata, see <u>Tutorial: Use full clone with a</u> <u>GitHub pipeline source</u>.

• Use the CLI to add the action configuration for the CodeStarSourceConnection action with the GitHub provider with the CLI steps shown in Create a pipeline (CLI).

🚯 Note

You can also create a connection using the Developer Tools console under **Settings**. See <u>Create a Connection</u>.

Before you begin:

- You must have created an account with GitHub.
- You must have already created a GitHub code repository.
- If your CodePipeline service role was created before December 18, 2019, you might need to update its permissions to use codestar-connections:UseConnection for AWS CodeStar connections. For instructions, see Add permissions to the CodePipeline service role.

Note

To create the connection, you must be the GitHub organization owner. For repositories that are not under an organization, you must be the repository owner.

Topics

- Create a connection to GitHub (console)
- Create a connection to GitHub (CLI)

Create a connection to GitHub (console)

Use these steps to use the CodePipeline console to add a connections action for your GitHub or GitHub Enterprise Cloud repository.

🚯 Note

In these steps, you can select specific repositories under **Repository Access**. Any repositories that are not selected will not be accessible or visible by CodePipeline.

Step 1: Create or edit your pipeline

- 1. Sign in to the CodePipeline console.
- 2. Choose one of the following.
 - Choose to create a pipeline. Follow the steps in *Create a Pipeline* to complete the first screen and choose Next. On the Source page, under Source Provider, choose GitHub (via GitHub App).
 - Choose to edit an existing pipeline. Choose Edit, and then choose Edit stage. Choose to add or edit your source action. On the Edit action page, under Action name, enter the name for your action. In Action provider, choose GitHub (via GitHub App).
- 3. Do one of the following:
 - Under **Connection**, if you have not already created a connection to your provider, choose **Connect to GitHub**. Proceed to Step 2: Create a Connection to GitHub.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to Step 3: Save the source action for your connection.

Step 2: Create a connection to GitHub

After you choose to create the connection, the **Connect to GitHub** page appears.

Create a connection Info	
Create GitHub App connection	
Connection name githubc-connectid	
	Connect to GitHub

To create a connection to GitHub

- Under GitHub connection settings, your connection name appears in Connection name. Choose Connect to GitHub. The access request page appears.
- 2. Choose **Authorize Amazon Connector for GitHub**. The connection page displays and shows the **GitHub Apps** field.

GitHub connection settings Info			
connection name			
githubc-connection			
SitHub Apps SitHub Apps create a link for your connection wit	th GitHub. To start, install a new app	and save th	nis connection.
Q		or	Install a new app

3. Under GitHub Apps, choose an app installation or choose Install a new app to create one.

You install one app for all of your connections to a particular provider. If you have already installed the Amazon Connector for GitHub app, choose it and skip this step.

🚯 Note

If you want to create a <u>user access token</u>, make sure that you've already installed the Amazon Connector for GitHub app and then leave the App installation field empty. CodeConnections will use the user access token for the connection.

4. On the **Install Amazon Connector for GitHub** page, choose the account where you want to install the app.

🚯 Note

You only install the app once for each GitHub account. If you previously installed the app, you can choose **Configure** to proceed to a modification page for your app installation, or you can use the back button to return to the console.

- 5. On the Install Amazon Connector for GitHub page, leave the defaults, and choose Install.
- 6. On the **Connect to GitHub** page, the connection ID for your new installation appears in **GitHub Apps**. Choose **Connect**.

Step 3: Save your GitHub source action

Use these steps on the **Edit action** page to save your source action with your connection information.

To save your GitHub source action

- 1. In **Repository name**, choose the name of your third-party repository.
- 2. Under **Pipeline triggers** you can add triggers if your action is an CodeConnections action. To configure the pipeline trigger configuration and to optionally filter with triggers, see more details in Add trigger with code push or pull request event types.
- 3. In **Output artifact format**, you must choose the format for your artifacts.
 - To store output artifacts from the GitHub action using the default method, choose
 CodePipeline default. The action accesses the files from the GitHub repository and stores the artifacts in a ZIP file in the pipeline artifact store.

 To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose Full clone. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Add CodeBuild GitClone permissions for connections to Bitbucket</u>, <u>GitHub, GitHub Enterprise Server, or GitLab.com</u>. For a tutorial that shows you how to use the **Full clone** option, see Tutorial: Use full clone with a GitHub pipeline source.

4. Choose **Next** on the wizard or **Save** on the **Edit action** page.

Create a connection to GitHub (CLI)

You can use the Amazon Command Line Interface (Amazon CLI) to create a connection.

To do this, use the **create-connection** command.

A Important

A connection created through the Amazon CLI or Amazon CloudFormation is in PENDING status by default. After you create a connection with the CLI or Amazon CloudFormation, use the console to edit the connection to make its status AVAILABLE.

To create a connection

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-connection command, specifying the --provider-type and -connection-name for your connection. In this example, the third-party provider name is GitHub and the specified connection name is MyConnection.

aws codestar-connections create-connection --provider-type GitHub --connection-name MyConnection

If successful, this command returns the connection ARN information similar to the following.

```
{
    "ConnectionArn": "arn:aws:codestar-connections:us-west-2:account_id:connection/
aEXAMPLE-8aad-4d5d-8878-dfcab0bc441f"
```

}

- 2. Use the console to complete the connection. For more information, see <u>Update a pending</u> <u>connection</u>.
- 3. The pipeline defaults to detect changes on code push to the connection source repository. To configure the pipeline trigger configuration for manual release or for Git tags, do one of the following:
 - To configure the pipeline trigger configuration to start with a manual release only, add the following line to the configuration:

```
"DetectChanges": "false",
```

 To configure the pipeline trigger configuration to filter with triggers, see more details in <u>Add</u> <u>trigger with code push or pull request event types</u>. For example, the following adds to the pipeline level of the pipeline JSON definition. In this example, release-v0 and releasev1 are the Git tags to include, and release-v2 is the Git tag to exclude.

```
"triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
                     "sourceActionName": "Source",
                     "push": [
                         {
                             "tags": {
                                  "includes": [
                                      "release-v0", "release-v1"
                                  ],
                                  "excludes": [
                                      "release-v2"
                                  ]
                             }
                         }
                     ]
                }
            }
        ]
```

GitHub Enterprise Server connections

Connections allow you to authorize and establish configurations that associate your third-party provider with your Amazon resources. To associate your third-party repository as a source for your pipeline, you use a connection.

🚺 Note

Instead of creating or using an existing connection in your account, you can use a shared connection between another Amazon Web Services account. See <u>Use a connection shared</u> with another account.

🚺 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

To add a GitHub Enterprise Server source action in CodePipeline, you can choose either to:

- Use the CodePipeline console Create pipeline wizard or Edit action page to choose the GitHub Enterprise Server provider option. See <u>Create a connection to GitHub Enterprise Server (console)</u> to add the action. The console helps you create a host resource and a connections resource.
- Use the CLI to add the action configuration for the CreateSourceConnection action with the GitHubEnterpriseServer provider and create your resources:
 - To create your connections resources, see <u>Create a host and connection to GitHub Enterprise</u> <u>Server (CLI)</u> to create a host resource and a connections resource with the CLI.
 - Use the CreateSourceConnection example action configuration in <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed actions to add your action as shown in <u>Create a pipeline (CLI)</u>.

Note

You can also create a connection using the Developer Tools console under **Settings**. See <u>Create a Connection</u>.

Before you begin:

• You must have created an account with GitHub Enterprise Server and installed the GitHub Enterprise Server instance on your infrastructure.

Note

Each VPC can only be associated with one host (GitHub Enterprise Server instance) at a time.

• You must have already created a code repository with GitHub Enterprise Server.

Topics

- Create a connection to GitHub Enterprise Server (console)
- Create a host and connection to GitHub Enterprise Server (CLI)

Create a connection to GitHub Enterprise Server (console)

Use these steps to use the CodePipeline console to add a connections action for your GitHub Enterprise Server repository.

🚺 Note

GitHub Enterprise Server connections only provide access to repositories owned by the GitHub Enterprise Server account that was used to create the connection.

Before you begin:

For a host connection to GitHub Enterprise Server, you must have completed the steps to create a host resource for your connection. See <u>Manage hosts for connections</u>.

Step 1: Create or edit your pipeline

To create or edit your pipeline

- 1. Sign in to the CodePipeline console.
- 2. Choose one of the following.
 - Choose to create a pipeline. Follow the steps in *Create a Pipeline* to complete the first screen and choose Next. On the Source page, under Source provider, choose GitHub Enterprise Server.
 - Choose to edit an existing pipeline. Choose **Edit**, and then choose **Edit stage**. Choose to add or edit your source action. On the **Edit action** page, under **Action name**, enter the name for your action. In **Action provider**, choose **GitHub Enterprise Server**.
- 3. Do one of the following:
 - Under Connection, if you have not already created a connection to your provider, choose Connect to GitHub Enterprise Server. Proceed to Step 2: Create a Connection to GitHub Enterprise Server.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to Step 3: Save the Source Action for Your Connection.

Create a connection to GitHub Enterprise Server

After you choose to create the connection, the **Connect to GitHub Enterprise Server** page is shown.

🔥 Important

Amazon CodeConnections does not support GitHub Enterprise Server version 2.22.0 due to a known issue in the release. To connect, upgrade to version 2.22.1 or the latest available version.

To connect to GitHub Enterprise Server

- 1. In **Connection name**, enter the name for your connection.
- 2. In **URL**, enter the endpoint for your server.

🚯 Note

If the provided URL has already been used to set up a GitHub Enterprise Server for a connection, you will be prompted to choose the host resource ARN that was created previously for that endpoint.

- 3. If you have launched your server into an Amazon VPC and you want to connect with your VPC, choose **Use a VPC** and complete the following.
 - a. In **VPC ID**, choose your VPC ID. Make sure to choose the VPC for the infrastructure where your GitHub Enterprise Server instance is installed or a VPC with access to your GitHub Enterprise Server instance through VPN or Direct Connect.
 - b. Under **Subnet ID**, choose **Add**. In the field, choose the subnet ID you want to use for your host. You can choose up to 10 subnets.

Make sure to choose the subnet for the infrastructure where your GitHub Enterprise Server instance is installed or a subnet with access to your installed GitHub Enterprise Server instance through VPN or Direct Connect.

c. Under **Security group IDs**, choose **Add**. In the field, choose the security group you want to use for your host. You can choose up to 10 security groups.

Make sure to choose the security group for the infrastructure where your GitHub Enterprise Server instance is installed or a security group with access to your installed GitHub Enterprise Server instance through VPN or Direct Connect.

d. If you have a private VPC configured, and you have configured your GitHub Enterprise Server instance to perform TLS validation using a non-public certificate authority, in **TLS certificate**, enter your certificate ID. The TLS Certificate value should be the public key of the certificate.

Q vpc-09	×	
Subnet IDs Choose the subnet or subnets for the VPC in which your	GitHub Enterprise Server is con	figured.
Subnet ID		
Q subnet-7d	×	Remove
Add		
Add Security group IDs Choose the security group or groups for the VPC in whice Security group ID	h your GitHub Enterprise Server	r is configured.
Security group IDs Choose the security group or groups for the VPC in whic	h your GitHub Enterprise Server	r is configured.

- Choose Connect to GitHub Enterprise Server. The created connection is shown with a Pending status. A host resource is created for the connection with the server information you provided. For the host name, the URL is used.
- 5. Choose Update pending connection.
- 6. If prompted, on the GitHub Enterprise login page, sign in with your GitHub Enterprise credentials.
- 7. On the **Create GitHub App** page, choose a name for your app.
- 8. On the GitHub authorization page, choose **Authorize <app-name>**.
- 9. On the app installation page, a message shows that the connector app is ready to be installed. If you have multiple organizations, you might be prompted to choose the organization where you want to install the app.

Choose the repository settings where you want to install the app. Choose Install.

10. The connection page shows the created connection in an Available status.

User Guide

Step 3: Save your GitHub Enterprise Server source action

Use these steps on the wizard or **Edit action** page to save your source action with your connection information.

To complete and save your source action with your connection

- 1. In **Repository name**, choose the name of your third-party repository.
- 2. Under **Pipeline triggers** you can add triggers if your action is an CodeConnections action. To configure the pipeline trigger configuration and to optionally filter with triggers, see more details in Add trigger with code push or pull request event types.
- 3. In **Output artifact format**, you must choose the format for your artifacts.
 - To store output artifacts from the GitHub Enterprise Server action using the default method, choose CodePipeline default. The action accesses the files from the GitHub Enterprise Server repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose **Full clone**. This option can only be used by CodeBuild downstream actions.
- 4. Choose **Next** on the wizard or **Save** on the **Edit action** page.

Create a host and connection to GitHub Enterprise Server (CLI)

You can use the Amazon Command Line Interface (Amazon CLI) to create a connection.

To do this, use the **create-connection** command.

\Lambda Important

A connection created through the Amazon CLI or Amazon CloudFormation is in PENDING status by default. After you create a connection with the CLI or Amazon CloudFormation, use the console to edit the connection to make its status AVAILABLE.

You can use the Amazon Command Line Interface (Amazon CLI) to create a host for installed connections.

Create a host and connection to GitHub Enterprise Server (CLI)

i Note

You only create a host once per GitHub Enterprise Server account. All of your connections to a specific GitHub Enterprise Server account will use the same host.

You use a host to represent the endpoint for the infrastructure where your third-party provider is installed. After you complete the host creation with the CLI, the host is in **Pending** status. You then set up, or register, the host to move it to an **Available** status. After the host is available, you complete the steps to create a connection.

To do this, use the **create-host** command.

🔥 Important

A host created through the Amazon CLI is in Pending status by default. After you create a host with the CLI, use the console or the CLI to set up the host to make its status Available.

To create a host

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-host command, specifying the --name, --provider-type, and -provider-endpoint for your connection. In this example, the third-party provider name is GitHubEnterpriseServer and the endpoint is my-instance.dev.

```
aws codestar-connections create-host --name MyHost --provider-type
GitHubEnterpriseServer --provider-endpoint "https://my-instance.dev"
```

If successful, this command returns the host Amazon Resource Name (ARN) information similar to the following.

```
{
    "HostArn": "arn:aws:codestar-connections:us-west-2:account_id:host/My-
Host-28aef605"
}
```

After this step, the host is in PENDING status.

2. Use the console to complete the host setup and move the host to an Available status.

To create a connection to GitHub Enterprise Server

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-connection command, specifying the --host-arn and --connection-name for your connection.

```
aws codestar-connections create-connection --host-arn arn:aws:codestar-
connections:us-west-2:account_id:host/MyHost-234EXAMPLE --connection-name
MyConnection
```

If successful, this command returns the connection ARN information similar to the following.

```
{
    "ConnectionArn": "arn:aws:codestar-connections:us-west-2:account_id:connection/
aEXAMPLE-8aad"
}
```

- 2. Use the console to set up the pending connection.
- 3. The pipeline defaults to detect changes on code push to the connection source repository. To configure the pipeline trigger configuration for manual release or for Git tags, do one of the following:
 - To configure the pipeline trigger configuration to start with a manual release only, add the following line to the configuration:

```
"DetectChanges": "false",
```

 To configure the pipeline trigger configuration to filter with triggers, see more details in <u>Add</u> <u>trigger with code push or pull request event types</u>. For example, the following adds to the pipeline level of the pipeline JSON definition. In this example, release-v0 and releasev1 are the Git tags to include, and release-v2 is the Git tag to exclude.

```
"triggers": [
        {
            "providerType": "CodeStarSourceConnection",
            "gitConfiguration": {
                "sourceActionName": "Source",
```



GitLab.com connections

Connections allow you to authorize and establish configurations that associate your third-party provider with your Amazon resources. To associate your third-party repository as a source for your pipeline, you use a connection.

Note

Instead of creating or using an existing connection in your account, you can use a shared connection between another Amazon Web Services account. See <u>Use a connection shared</u> with another account.

Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

To add a GitLab.com source action in CodePipeline, you can choose either to:

- Use the CodePipeline console Create pipeline wizard or Edit action page to choose the GitLab provider option. See Create a connection to GitLab.com (console) to add the action. The console helps you create a connections resource.
- Use the CLI to add the action configuration for the CreateSourceConnection action with the GitLab provider as follows:
 - To create your connections resources, see <u>Create a connection to GitLab.com (CLI)</u> to create a connections resource with the CLI.
 - Use the CreateSourceConnection example action configuration in <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed actions to add your action as shown in Create a pipeline (CLI).

Note

You can also create a connection using the Developer Tools console under **Settings**. See <u>Create a Connection</u>.

i Note

By authorizing this connection installation in GitLab.com, you grant our service permissions to process your data by accessing your account, and you can revoke the permissions at any time by uninstalling the application.

Before you begin:

• You must have already created an account with GitLab.com.

Note

Connections only provide access to repositories owned by the account that was used to create and authorize the connection.

🚯 Note

You can create connections to a repository where you have the **Owner** role in GitLab, and then the connection can be used with the repository with resources such as CodePipeline. For repositories in groups, you do not need to be the group owner.

• To specify a source for your pipeline, you must have already created a repository on gitlab.com.

Topics

- Create a connection to GitLab.com (console)
- <u>Create a connection to GitLab.com (CLI)</u>

Create a connection to GitLab.com (console)

Use these steps to use the CodePipeline console to add a connections action for your project (repository) in GitLab.

To create or edit your pipeline

- 1. Sign in to the CodePipeline console.
- 2. Choose one of the following.
 - Choose to create a pipeline. Follow the steps in *Create a Pipeline* to complete the first screen and choose **Next**. On the **Source** page, under **Source Provider**, choose **GitLab**.
 - Choose to edit an existing pipeline. Choose **Edit**, and then choose **Edit stage**. Choose to add or edit your source action. On the **Edit action** page, under **Action name**, enter the name for your action. In **Action provider**, choose **GitLab**.
- 3. Do one of the following:
 - Under Connection, if you have not already created a connection to your provider, choose
 Connect to GitLab. Proceed to step 4 to create the connection.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to step 9.

🚯 Note

If you close the pop-up window before a GitLab.com connection is created, you need to refresh the page.

4. To create a connection to a GitLab.com repository, under **Select a provider**, choose **GitLab**. In **Connection name**, enter the name for the connection that you want to create. Choose **Connect to GitLab**.

Developer Tools > <u>Connections</u> > Create connection	
Create a connection Info	
Create GitLab connection Info	
Connection name	
Tags - optional	
	Connect to GitLab

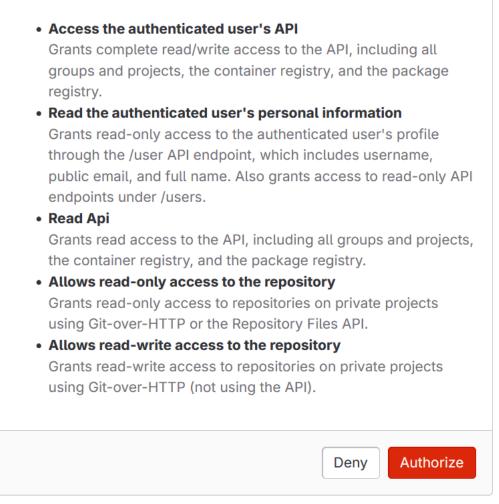
- 5. When the sign-in page for GitLab.com displays, log in with your credentials, and then choose **Sign in**.
- 6. If this is your first time authorizing the connection, an authorization page displays with a message requesting authorization for the connection to access your GitLab.com account.

Choose Authorize.

Authorize codestar-connections to use your account?

An application called codestar-connections is requesting access to your GitLab account. This application was created by Amazon AWS. Please note that this application is not provided by GitLab and you should verify its authenticity before allowing access.

This application will be able to:



- 7. The browser returns to the connections console page. Under **Create GitLab connection**, the new connection is shown in **Connection name**.
- 8. Choose **Connect to GitLab**.

You will be returned to the CodePipeline console.

🚯 Note

After a GitLab.com connection is successfully created, a success banner will be displayed on the main window.

If you have not previously logged in to GitLab on the current machine, you will need to manually close the pop-up window.

9. In Repository name, choose the name of your project in GitLab by specifying the project path with the namespace. For example, for a group-level repository, enter the repository name in the following format: group-name/repository-name. For more information about the path and namespace, see the path_with_namespace field in https://docs.gitlab.com/ee/api/projects.html#get-single-project. For more information about the namespace in GitLab, see https://docs.gitlab.com/ee/user/namespace/.

🚺 Note

For groups in GitLab, you must manually specify the project path with the namespace. For example, for a repository named myrepo in a group mygroup, enter the following: mygroup/myrepo. You can find the project path with the namespace in the URL in GitLab.

- 10. Under **Pipeline triggers** you can add triggers if your action is an CodeConnections action. To configure the pipeline trigger configuration and to optionally filter with triggers, see more details in Add trigger with code push or pull request event types.
- 11. In **Branch name**, choose the branch where you want your pipeline to detect source changes.

🚯 Note

If the branch name does not populate automatically, then you do not have **Owner** access to the repository. Either the project name is not valid, or the connection used doesn't have access to the project/repository.

- 12. In **Output artifact format**, you must choose the format for your artifacts.
 - To store output artifacts from the GitLab.com action using the default method, choose CodePipeline default. The action accesses the files from the GitLab.com repository and stores the artifacts in a ZIP file in the pipeline artifact store.

 To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose Full clone. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Add CodeBuild GitClone permissions for connections to Bitbucket</u>, <u>GitHub, GitHub Enterprise Server, or GitLab.com</u>. For a tutorial that shows you how to use the **Full clone** option, see Tutorial: Use full clone with a GitHub pipeline source.

13. Choose to save the source action and continue.

Create a connection to GitLab.com (CLI)

You can use the Amazon Command Line Interface (Amazon CLI) to create a connection.

To do this, use the **create-connection** command.

🔥 Important

A connection created through the Amazon CLI or Amazon CloudFormation is in PENDING status by default. After you create a connection with the CLI or Amazon CloudFormation, use the console to edit the connection to make its status AVAILABLE.

To create a connection

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-connection command, specifying the --provider-type and -connection-name for your connection. In this example, the third-party provider name is GitLab and the specified connection name is MyConnection.

aws codestar-connections create-connection --provider-type GitLab --connection-name MyConnection

If successful, this command returns the connection ARN information similar to the following.

```
"ConnectionArn": "arn:aws:codestar-connections:us-west-2:account_id:connection/
aEXAMPLE-8aad-4d5d-8878-dfcab0bc441f"
```

{

}

- Use the console to complete the connection. For more information, see Update a pending 2. connection.
- The pipeline defaults to detect changes on code push to the connection source repository. To 3. configure the pipeline trigger configuration for manual release or for Git tags, do one of the following:
 - To configure the pipeline trigger configuration to start with a manual release only, add the following line to the configuration:

```
"DetectChanges": "false",
```

• To configure the pipeline trigger configuration to filter with triggers, see more details in Add trigger with code push or pull request event types. For example, the following adds to the pipeline level of the pipeline JSON definition. In this example, release-v0 and releasev1 are the Git tags to include, and release-v2 is the Git tag to exclude.

```
"triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
                     "sourceActionName": "Source",
                     "push": [
                         {
                             "tags": {
                                  "includes": [
                                      "release-v0", "release-v1"
                                  ],
                                  "excludes": [
                                      "release-v2"
                                  ]
                             }
                         }
                     ]
                }
            }
        ]
```

Connections for GitLab self-managed

Connections allow you to authorize and establish configurations that associate your third-party provider with your Amazon resources. To associate your third-party repository as a source for your pipeline, you use a connection.

🚺 Note

Instead of creating or using an existing connection in your account, you can use a shared connection between another Amazon Web Services account. See <u>Use a connection shared</u> with another account.

🚺 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

To add a GitLab self-managed source action in CodePipeline, you can choose either to:

- Use the CodePipeline console Create pipeline wizard or Edit action page to choose the GitLab self-managed provider option. See <u>Create a connection to GitLab self-managed (console)</u> to add the action. The console helps you create a host resource and a connections resource.
- Use the CLI to add the action configuration for the CreateSourceConnection action with the GitLabSelfManaged provider and create your resources:
 - To create your connections resources, see <u>Create a host and connection to GitLab self-</u> managed (CLI) to create a host resource and a connections resource with the CLI.
 - Use the CreateSourceConnection example action configuration in <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed actions to add your action as shown in <u>Create a pipeline (CLI)</u>.

🚯 Note

You can also create a connection using the Developer Tools console under **Settings**. See <u>Create a Connection</u>.

Before you begin:

 You must have already created an account with GitLab and have GitLab Enterprise Edition or GitLab Community Edition with a self-managed installation. For more information, see https://docs.gitlab.com/ee/subscriptions/self_managed/.

🚯 Note

Connections only provide access for the account that was used to create and authorize the connection.

í) Note

You can create connections to a repository where you have the **Owner** role in GitLab, and then the connection can be used with with resources such as CodePipeline. For repositories in groups, you do not need to be the group owner.

 You must have already created a GitLab personal access token (PAT) with the following scopeddown permission only: api. For more information, see https://docs.gitlab.com/ee/user/profile/ personal_access_tokens.html. You must be an administrator to create and use the PAT.

🚯 Note

Your PAT is used to authorize the host and is not otherwise stored or used by connections. To set up a host, you can create a temporary PAT and then after you set up the host, you can delete the PAT.

You can choose to set up your host ahead of time. You can set up a host with or without a VPC.
 For details about VPC configuration and additional information about creating a host, see <u>Create</u> <u>a host</u>.

- Create a connection to GitLab self-managed (console)
- Create a host and connection to GitLab self-managed (CLI)

Create a connection to GitLab self-managed (console)

Use these steps to use the CodePipeline console to add a connections action for your GitLab selfmanagedr repository.

🚯 Note

GitLab self-managed connections only provide access to repositories owned by the GitLab self-managed account that was used to create the connection.

Before you begin:

For a host connection to GitLab self-managed, you must have completed the steps to create a host resource for your connection. See Manage hosts for connections.

Step 1: Create or edit your pipeline

To create or edit your pipeline

- 1. Sign in to the CodePipeline console.
- 2. Choose one of the following.
 - Choose to create a pipeline. Follow the steps in *Create a Pipeline* to complete the first screen and choose Next. On the Source page, under Source provider, choose GitLab selfmanaged.
 - Choose to edit an existing pipeline. Choose **Edit**, and then choose **Edit stage**. Choose to add or edit your source action. On the **Edit action** page, under **Action name**, enter the name for your action. In **Action provider**, choose **GitLab self-managed**.
- 3. Do one of the following:
 - Under Connection, if you have not already created a connection to your provider, choose Connect to GitLab self-managed. Proceed to Step 2: Create a Connection to GitLab selfmanaged.

• Under **Connection**, if you have already created a connection to your provider, choose the connection, and then proceed to Step 3: Save your GitLab self-managed source action.

Step 2: Create a connection to GitLab self-managed

After you choose to create the connection, the **Connect to GitLab self-managed** page is shown.

To connect to GitLab self-managed

- 1. In **Connection name**, enter the name for your connection.
- 2. In **URL**, enter the endpoint for your server.

Note

If the provided URL has already been used to set up a host for a connection, you will be prompted to choose the host resource ARN that was created previously for that endpoint.

- 3. If you have launched your server into an Amazon VPC and you want to connect with your VPC, choose **Use a VPC** and complete the information for the VPC.
- 4. Choose **Connect to GitLab self-managed**. The created connection is shown with a **Pending** status. A host resource is created for the connection with the server information you provided. For the host name, the URL is used.
- 5. Choose Update pending connection.
- 6. If a page opens with a redirect message confirming that you want to continue to the provider, choose **Continue**. Enter the authorization for the provider.
- 7. A **Set up** *host_name* page displays. In **Provide personal access token**, provide your GitLab PAT with the following scoped-down permission only: api.

🚯 Note

Only an administrator can create and use the PAT.

Choose Continue.

Create a connection to GitLab self-managed (console)

Set up myhostgl
Provide personal access token
To set up GitLab self-managed, provide your personal access token from GitLab. The personal access token is required to have the following scoped-down permissions only: api.
Cancel Continue

8. The connection page shows the created connection in an **Available** status.

Step 3: Save your GitLab self-managed source action

Use these steps on the wizard or **Edit action** page to save your source action with your connection information.

To complete and save your source action with your connection

- 1. In **Repository name**, choose the name of your third-party repository.
- 2. Under **Pipeline triggers** you can add triggers if your action is an CodeConnections action. To configure the pipeline trigger configuration and to optionally filter with triggers, see more details in Add trigger with code push or pull request event types.
- 3. In **Output artifact format**, you must choose the format for your artifacts.
 - To store output artifacts from the GitLab self-managed action using the default method, choose **CodePipeline default**. The action accesses the files from the repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose Full clone. This option can only be used by CodeBuild downstream actions.
- 4. Choose **Next** on the wizard or **Save** on the **Edit action** page.

Create a host and connection to GitLab self-managed (CLI)

You can use the Amazon Command Line Interface (Amazon CLI) to create a connection.

To do this, use the **create-connection** command.

<u> Important</u>

A connection created through the Amazon CLI or Amazon CloudFormation is in PENDING status by default. After you create a connection with the CLI or Amazon CloudFormation, use the console to edit the connection to make its status AVAILABLE.

You can use the Amazon Command Line Interface (Amazon CLI) to create a host for installed connections.

You use a host to represent the endpoint for the infrastructure where your third-party provider is installed. After you complete the host creation with the CLI, the host is in **Pending** status. You then set up, or register, the host to move it to an **Available** status. After the host is available, you complete the steps to create a connection.

To do this, use the **create-host** command.

<u> Important</u>

A host created through the Amazon CLI is in Pending status by default. After you create a host with the CLI, use the console or the CLI to set up the host to make its status Available.

To create a host

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the create-host command, specifying the --name, --provider-type, and -provider-endpoint for your connection. In this example, the third-party provider name is GitLabSelfManaged and the endpoint is my-instance.dev.

```
aws codestar-connections create-host --name MyHost --provider-type
GitLabSelfManaged --provider-endpoint "https://my-instance.dev"
```

If successful, this command returns the host Amazon Resource Name (ARN) information similar to the following.

```
{
    "HostArn": "arn:aws:codestar-connections:us-west-2:account_id:host/My-
Host-28aef605"
}
```

After this step, the host is in PENDING status.

2. Use the console to complete the host setup and move the host to an Available status.

To create a connection to GitLab self-managed

1. Open a terminal (Linux, OS X, or Unix) or command prompt (Windows). Use the Amazon CLI to run the **create-connection** command, specifying the --host-arn and --connection-name for your connection.

```
aws codestar-connections create-connection --host-arn arn:aws:codestar-
connections:us-west-2:account_id:host/MyHost-234EXAMPLE --connection-name
MyConnection
```

If successful, this command returns the connection ARN information similar to the following.

```
{
    "ConnectionArn": "arn:aws:codestar-connections:us-west-2:account_id:connection/
aEXAMPLE-8aad"
}
```

- 2. Use the console to set up the pending connection.
- 3. The pipeline defaults to detect changes on code push to the connection source repository. To configure the pipeline trigger configuration for manual release or for Git tags, do one of the following:
 - To configure the pipeline trigger configuration to start with a manual release only, add the following line to the configuration:

```
"DetectChanges": "false",
```

 To configure the pipeline trigger configuration to filter with triggers, see more details in <u>Add</u> <u>trigger with code push or pull request event types</u>. For example, the following adds to the pipeline level of the pipeline JSON definition. In this example, release-v0 and releasev1 are the Git tags to include, and release-v2 is the Git tag to exclude.

```
"triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
                     "sourceActionName": "Source",
                     "push": [
                         {
                             "tags": {
                                  "includes": [
                                      "release-v0", "release-v1"
                                  ],
                                  "excludes": [
                                      "release-v2"
                                  ]
                             }
                         }
                     ]
                }
            }
        ]
```

Use a connection shared with another account

You can create and manage a shared connection using Amazon RAM. This allows connections to be shared between Amazon Web Services accounts for access to third-party repositories. This allows a single connection to be used in CodePipeline pipelines across accounts while reducing the need for users to manage and administer separate connections in each account.

To use shared connections in CodePipeline, do the following.

- Create a connection using the Developer Tools console under **Settings**. See <u>Create a Connection</u>.
- Set up the resource share using Amazon RAM. See <u>Share connections with Amazon Web Services</u> <u>accounts</u>.

• When you use the CodePipeline console **Create pipeline** wizard or **Edit action** page to choose the connection provider, such as the **Bitbucket** provider option, you can choose the connection that has been shared with the target account.

Automate starting pipelines using triggers and filtering

Triggers allow you to configure your pipeline to start on a particular event type or filtered event type, such as when a change on a particular branch or pull request is detected. Triggers are configurable for source actions with connections that use the CodeStarSourceConnection action in CodePipeline, such as GitHub, Bitbucket, and GitLab. For more information about source actions that use connections, see <u>Add third-party source providers to pipelines using</u> CodeConnections.

Source actions, such as CodeCommit and S3, use automated change detection to start pipelines when a change is made. For more information, see CodeCommit source actions and EventBridge.

You specify triggers using the console or CLI.

You specify filter types as follows:

• No filter

This trigger configuration starts your pipeline on any push to the default branch specified as part of action configuration.

• Specify filter

You add a filter that starts your pipeline on a specific filter, such as on branch names for a code push, and fetches the exact commit. This also configures the pipeline not to start automatically on any change.

• Push

- Valid filter combinations are:
 - Git tags

Include or exclude

• branches

Include or exclude

branches + file paths

Include or exclude

- Pull request
 - Valid filter combinations are:

Include or exclude

• branches + file paths

Include or exclude

• Do not detect changes

This does not add a trigger and the pipeline does not start automatically on any change.

The following table provides valid filter options for each event type. The table also shows which trigger configurations default to true or false for automatic change detection in the action configuration.

Trigger configura tion	Event type	Filter options	Detect changes
Add a trigger – no filter	none	none	true
Add a trigger – filter on code push	push event	Git tags, branches, file paths	false
Add a trigger – filter for pull requests	pull requests	branches, file paths	false
No trigger – do not detect	none	none	false

🚯 Note

This trigger type uses automated change detection (as the Webhook trigger type). The source action providers that use this trigger type are connections configured for code push (Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com, and GitLab self-managed).

For field definitions and further reference for triggers, see

For a list of field definitions in the JSON structure, see triggers.

For filtering, regular expression patterns in glob format are supported as detailed in <u>Working with</u> <u>glob patterns in syntax</u>.

🚯 Note

In certain cases, for pipelines with triggers that are filtered on file paths, the pipeline might not start when a branch with a file path filter is first created. For more information, see <u>Pipelines with connections that use trigger filtering by file paths might not start at branch creation</u>.

Considerations for trigger filters

The following considerations apply when using triggers.

- You cannot add more than one trigger per source action.
- You can add multiple filter types to a trigger. For an example, see <u>4: A trigger with two push filter</u> types with conflicting includes and excludes.
- For a trigger with branch and file paths filters, when pushing the branch for the first time, the pipeline won't run since there is not access to the list of files changed for the newly created branch.
- Merging a pull request might trigger two pipeline executions in cases where push (branches filter) and pull request (branches filter) trigger configurations intersect.
- For a filter that triggers your pipeline on pull request events, for the Closed pull request event type, the third-party repository provider for your connection might have a separate status for a merge event. For example, in Bitbucket, the Git event for a merge is not a pull request closure event. However, in GitHub, merging a pull request is a closure event. For more information, see <u>Pull request events for triggers by provider</u>.

Pull request events for triggers by provider

The following table provides a summary of the Git events, such as for pull request closure, that result in pull request event types by provider.

	Repository provider for your connection				
PR event for trigger	Bitbucket	GitHub	GHES	GitLab	
Open - This option triggers the pipeline when a pull request is created for the branch/file path.	Creating a pull request results in an Opened Git event.	Creating a pull request results in an Opened Git event.	Creating a pull request results in an Opened Git event.	Creating a pull request results in an Opened Git event.	
Update - This option triggers the pipeline when a pull request revision is published for the branch/file path.	Publishing an update results in an Updated Git event.	Publishing an update results in an Updated Git event.	Publishing an update results in an Updated Git event.	Publishing an update results in an Updated Git event.	
Closed - This option triggers the pipeline when a pull request is closed for the branch/fi le path.	Merging a pull request in Bitbucket results in a Closed Git event. Important: Manually closing a pull request in Bitbucket without merging does not result in a Closed Git event.	Merging or manually closing a pull request results in a Closed Git event.	Merging or manually closing a pull request results in a Closed Git event.	Merging or manually closing a pull request results in a Closed Git event.	

Examples for trigger filters

For a Git configuration with filters for push and pull request event types, the specified filters might conflict with each other. The following are examples of valid filter combinations for push and pull request events. A trigger can contain multiple filter types, such as two push filter types in the trigger configuration, and the push and pull request filter types will use an OR operation between them, meaning any match will start the pipeline. Similarly, each filter type can include multiple filters such as filePaths and branches; these filters will use an AND operation, meaning only a full match will start the pipeline. Each filter type can contain includes and excludes, and these will use an AND operation between them, meaning only a full match will start the pipeline. Names inside of the include/exclude, such as branch names, use an OR operation. If there is a conflict such as between two Push filters such as where one includes the main branch and one excludes it, then the default is to exclude. The following list summarizes the operations for each part of the Git configuration object.

For a list of field definitions in the JSON structure and a detailed reference for includes and excludes, see <u>triggers</u>.

Example 1: A filter type with filters for branches and file paths (AND operation)

For a single filter type such as pull request, you can combine filters, and these filters will use an AND operation, meaning only a full match will start the pipeline. The following example shows a Git configuration for a push event type with two different filters (filePaths and branches). In the following example, filePaths will be AND'ed with branches:

```
{
   "filePaths": {
     "includes": ["common/**/*.js"]
   },
   "branches": {
     "includes": ["feature/**"]
   }
}
```

With the Git configuration above, this example shows an event that will start the pipeline execution because the AND operation succeeds. In other words, the file path common/app.js is included for the filter, which starts the pipeline as an AND even if the branch refs/heads/ feature/triggers specified did not have an impact.

The following example shows an event for a trigger with the above configuration that will not start the pipeline execution because the branch is able to filter, but the file path is not.

Example 2: Includes and excludes use an AND operation between them

Trigger filters, such as branch in a single pull request event type, use an AND operation between the includes and excludes. This allows you to configure multiple triggers to start the execution for the same pipeline. The following example shows a trigger configuration with a single filter type (branches) in the configuration object for a push event. The Includes and Excludes operations will be AND'ed, meaning that if a branch matches an exclude pattern (such as feature-branch in the example), the pipeline will not be triggered unless an include also matches. If the include pattern matches, such as for the main branch, then the pipeline will be triggered. For the following example JSON:

- Pushing a commit to the main branch will trigger the pipeline
- Pushing a commit to the feature-branch branch will not trigger the pipeline.

```
{
    "branches": {
        "Includes": [
            "main"
     ],
        "Excludes": [
            "feature-branch"
     ]
     }
```

Example 3: A trigger with push and pull request filter types (OR operation), filters for file paths and branches (AND operation), and includes/excludes (AND operation)

Trigger configuration objects, such as a trigger that contains a push event type and a pull request event type, use an OR operation between the two event types. The following example shows a trigger configuration with a push event type with the main branch included and one pull request event type with the same branch main excluded. Additionally, the push event type has one file path LICENSE.txt excluded and one file path README.MD included. For the second event type, a pull request that is either Closed or Created on the feature-branch branch (included) starts the pipeline, and the pipeline does not start when creating or closing a pull request on the feature-branch-2 or main branches (excluded).The Includes and Excludes operations will be AND'd, with a conflict defaulting to the exclude. For example, for a pull request event on the feature-branch branch (included for the pull request) while the feature-branch branch is excluded for the push event type, so the default will be to exclude.

For the following example,

- Pushing a commit to the main branch (included) for the README.MD file path (included) will trigger the pipeline.
- On the feature-branch branch (excluded), pushing a commit will not trigger the pipeline.
- On the included branch, editing the README. MD file path (included) triggers the pipeline.
 - On the included branch, editing the LICENSE.TXT

file path (excluded) does not trigger the pipeline.

On the feature-branch branch, closing a pull request for the README.MD file path (included for the push event) will not trigger the pipeline because the push event type specifies the feature-branch branch as excluded and so the conflict defaults to the exclude.

The following image shows the configuration.

ers
action: Source
Pull request Events: Closed Created Include branches: feature-branch Exclude branches: Exclude branches: Exclude branches:

The following is the example JSON for the configuration.

```
"triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
                     "sourceActionName": "Source",
                    "push": [
                         {
                             "branches": {
                                 "includes": [
                                      "main"
                                 ],
                                 "excludes": [
                                     "feature-branch",
                                     "feature-branch-2"
                                 ]
                             },
                             "filePaths": {
                                 "includes": [
                                     "README.md"
                                 ],
                                 "excludes": [
                                      "LICENSE.txt"
```



Example 4: A trigger with two push filter types with conflicting includes and excludes

The following image shows a push filter type specifying to filter on the tag release-1 (included). A second push filter type is added specifying to filter on the branch main (included) and to not start for a push to the feature* branches (excluded).

For the following example:

Pushing a release from the tag release-1 (included for the first push filter) on the feature-branch branch (excluded as feature* for the second push filter) will not trigger the pipeline because the two event types will be AND'd.

Pushing a release from the main branch (included for the second Push filter) will start the pipeline.

The following example of the Edit page shows the two Push filter types and their configuration for includes and excludes.

Edit: Triggers						Cancel	Done
For source action: Source							Remove
Filters							
Push Include tags: release-1	0 ×	Push Include branches: main* Exclude branches: feature*	0 > ×	+ Add filter			

The following is the example JSON for the configuration.

```
"triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
                     "sourceActionName": "Source",
                     "push": [
                         {
                             "tags": {
                                 "includes": [
                                      "release-1"
                                 ]
                             }
                         },
                         {
                             "branches": {
                                 "includes": [
                                      "main*"
                                 ],
                                 "excludes": [
                                      "feature*"
                                 ]
                             }
                         }
                     ]
                }
            }
        ]
   },
```

Example 5: Trigger configured while default action configuration BranchName is used for a manual start

The action configuration default BranchName field defines a single branch that will be used when the pipeline is started manually, while triggers with filters can be used for any branch or branches that you specify.

The following is the example JSON for the action configuration showing the BranchName field.

```
{
                "name": "Source",
                "actions": [
                     {
                         "name": "Source",
                         "actionTypeId": {
                             "category": "Source",
                             "owner": "AWS",
                             "provider": "CodeStarSourceConnection",
                             "version": "1"
                         },
                         "runOrder": 1,
                         "configuration": {
                             "BranchName": "main",
                             "ConnectionArn": "ARN",
                             "DetectChanges": "false",
                             "FullRepositoryId": "owner-name/my-bitbucket-repo",
                             "OutputArtifactFormat": "CODE_ZIP"
                         },
                         "outputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
                         ],
                         "inputArtifacts": [],
                         "region": "us-west-2",
                         "namespace": "SourceVariables"
                     }
                ],
```

The following example action output shows the default branch main was used when the pipeline was manually started.

Action execution details X					
Summary Inpu	at Output				
Output artifact	SourceArtifact 🔼				
AuthorDate	2024-11-08T00:16:03Z				
AuthorDisplayName					
AuthorEmail	r@amazon.com				
Authorld					
BranchName	main				
CommitId	e87b1678ec5c50b2addf20f213cc7				
CommitMessage	Dockerfile created online with Bitbucket				
ConnectionArn	arn:aws:codestar-connections:us-west-2: connection/cdacd948-8633-4409-a4e f-				
FullRepositoryName	/dk-bitbucket-repo				
ProviderType	Bitbucket				
	Done				

The following example action output shows the pull request and branch that was used for the trigger when filtered by pull request.

Action execution deta Action name: Source Statu		¢
Summary Input	Output	
AuthorDate	SourceArtifact [2] 2024-10-23T19:12:43Z	
AuthorDisplayName AuthorEmail	@amazon.com	
Authorld	{c26d1f33-2013-46e8-b193 }	
CommitId	32b96d37d12c53680a16029cc3	
CommitMessage	README.md edited online with Bitbucket	
ConnectionArn	arn:aws:codestar-connections:us-west-2: connection/cdacd948-8633-4409 -a4c	
DestinationBranchName	feature-branch	
FullRepositoryName	/dk-bitbucket-repo	
ProviderType	Bitbucket	
PullRequestId	6	
PullRequestTitle	Feature branch 2	
SourceBranchName	feature-branch-2	
	Done	

Add trigger on code push with no filter

Triggers allow you to configure your pipeline to start on a particular event type, such as a code push or pull request. Triggers are configurable for source actions with connections that use the CodeStarSourceConnection action in CodePipeline, such as GitHub, Bitbucket, and GitLab.

Adding a trigger (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit. Otherwise, use these steps on the pipeline creation wizard.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose the source action you want to edit. Choose **Edit triggers**. Choose to add a trigger.
- 5. In **Trigger type**, choose **No filter**.

Add trigger with code push or pull request event types

You can configure filters for pipeline triggers to have pipeline executions started for different Git events, such as tag or branch push, changes in specific file paths, a pull request opened into a specific branch, and so on. You can use the Amazon CodePipeline console or the **create-pipeline** and **update-pipeline** commands in the Amazon CLI to configure trigger filters.

🚺 Note

The action configuration BranchName field defines a single branch, while triggers with filters can be used for any branch or branches that you specify. For a pipeline where triggers are used to filter branches by push or pull request, the pipeline won't use the default BranchName field branch in the action configuration. However, the branch in the BranchName field in the action configuration is the default when the pipeline is started manually. For an example, see <u>5: Trigger configured while default action configuration</u> BranchName is used for a manual start.

• Push

A push trigger starts a pipeline when a change is pushed to your source repository. The execution will use the commit from the branch that you're pushing *to* (that is, the destination branch). You can filter push triggers on branches, file paths, or Git tags.

• Pull request

A pull request trigger starts a pipeline when a pull request is opened, updated, or closed in your source repository. The execution will use the commit from the source branch that you're pulling *from* (that is, the source branch). You can filter pull request triggers on branches and file paths.

The supported event types for pull requests are the following. All other pull request events are ignored.

- Opened
- Updated
- Closed (merged)

Note

Certain pull request event behavior can differ by provider. For details, see <u>Pull request</u> events for triggers by provider.

The pipeline definition allows you to combine different filters within the same push trigger configuration. For details about the pipeline definition, see <u>Add filters for push and pull request</u> <u>event types (CLI)</u>. For a list of field definitions, see <u>triggers</u> in the *Pipeline structure reference* in this guide.

Topics

- Add filters for push and pull request event types (console)
- Add filters for push and pull request event types (CLI)
- Add filters for push and pull request event types (Amazon CloudFormation templates)

Add filters for push and pull request event types (console)

You can use the console to add filters for push events and include or exclude branches or file paths.

Add filters (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit. Otherwise, use these steps on the pipeline creation wizard.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose the source action you want to edit. Choose **Edit triggers**. Choose **Specify filter**.
- 5. In **Event type**, choose **Push** from the following options.
 - Choose **Push** to start the pipeline when a change is pushed to your source repository.
 Choosing this enables the fields to specify filters for branches and file paths or Git tags.
 - Choose **Pull request** to start the pipeline when a pull request is opened, updated, or closed in your source repository. Choosing this enables the fields to specify filters for destination branches and file paths.
- 6. Under **Push**, in **Filter type**, choose one of the following options.
 - Choose Branch to specify the branches in your source repository that the trigger monitors in
 order to know when to start a workflow run. In Include, enter patterns for branch names in
 glob format that you want to specify for the trigger configuration to start your pipeline on
 changes in the specified branches. In Exclude, enter the regex patterns for branch names in
 glob format that you want to specify for the trigger configuration to ignore and to not start
 your pipeline on changes in the specified branches. See Working with glob patterns in syntax
 for more information.

🚯 Note

If the include and exclude both have the same pattern, then the default is to exclude the pattern.

You can use glob patterns to define your branch names. For example, use main* to match all branches beginning with main. See <u>Working with glob patterns in syntax</u> for more information.

For a push trigger, specify the branches you're pushing *to*, that is, the *destination* branches. For a pull request trigger, specify destination branches you're opening pull request to.

• (Optional) Under **File paths**, specify file paths for your trigger. Enter the names in **Include** and **Exclude** as appropriate.

You can use glob patterns to define your file path names. For example, use prod* to match all file paths beginning with prod. See <u>Working with glob patterns in syntax</u> for more information.

- Choose Tags to configure the pipeline trigger configuration to start with Git tags. In
 Include, enter patterns for tag names in glob format that you want to specify for the trigger
 configuration to start your pipeline on release of the specified tag or tags. In Exclude, enter
 the regex patterns for tag names in glob format that you want to specify for the trigger
 configuration to ignore and to not start your pipeline on release of the specified tag or tags.
 If the include and exclude both have the same tag pattern, then the default is to exclude the
 tag pattern.
- 7. Under **Push**, in **Filter type**, choose one of the following options.
 - Choose Branch to specify the branches in your source repository that the trigger monitors in
 order to know when to start a workflow run. In Include, enter patterns for branch names in
 glob format that you want to specify for the trigger configuration to start your pipeline on
 changes in the specified branches. In Exclude, enter the regex patterns for branch names in
 glob format that you want to specify for the trigger configuration to ignore and to not start
 your pipeline on changes in the specified branches. See Working with glob patterns in syntax
 for more information.

Note

If the include and exclude both have the same pattern, then the default is to exclude the pattern.

You can use glob patterns to define your branch names. For example, use main* to match all branches beginning with main. See <u>Working with glob patterns in syntax</u> for more information.

For a push trigger, specify the branches you're pushing *to*, that is, the *destination* branches. For a pull request trigger, specify destination branches you're opening pull request to.

• (Optional) Under **File paths**, specify file paths for your trigger. Enter the names in **Include** and **Exclude** as appropriate.

You can use glob patterns to define your file path names. For example, use prod* to match all file paths beginning with prod. See <u>Working with glob patterns in syntax</u> for more information.

• Choose **Pull request** to configure the pipeline trigger configuration to start with pull request events that you specify.

Add filters for push and pull request event types (CLI)

You can update the pipeline JSON to add filters for triggers.

To use the Amazon CLI to create or update your pipeline, use the create-pipeline or updatepipeline command.

The following example JSON structure provides a reference for the field definitions under createpipeline.

For a list of field definitions, see triggers in the *Pipeline structure reference* in this guide.

```
"projectA/**",
                "common/**/*.js"
            ],
            "excludes": [
                "**/README.md",
                "**/LICENSE",
                "**/CONTRIBUTING.md"
            ]
        },
        "branches": {
            "includes": [
                "feature/**",
                "release/**"
            ],
            "excludes": [
                "mainline"
            ]
        },
        "tags": {
            "includes": [
                "release-v0", "release-v1"
            ],
            "excludes": [
                "release-v2"
            ]
        }
    }
],
"pullRequest": [
    {
        "events": [
            "CLOSED"
        ],
        "branches": {
            "includes": [
                "feature/**",
                "release/**"
            ],
            "excludes": [
                "mainline"
            ]
        },
        "filePaths": {
            "includes": [
```



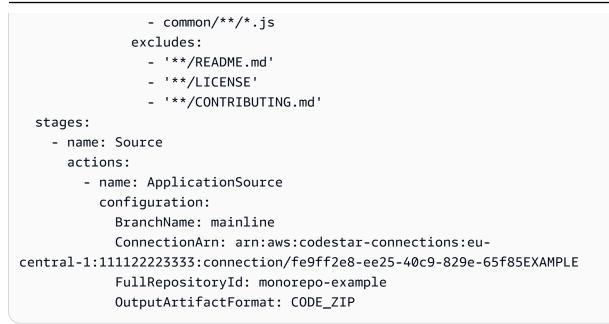
Add filters for push and pull request event types (Amazon CloudFormation templates)

You can update the pipeline resource in Amazon CloudFormation to add trigger filtering.

The following example template snippet provides a YAML reference for triggers field definitions. For a list of field definitions, see <u>triggers</u> in the *Pipeline structure reference* in this guide.

For a full template example for a connection source and trigger filter configuration, see <u>Pipeline</u> with two stages and trigger configuration in the *Amazon CloudFormation User Guide*.

```
pipeline:
  name: MyServicePipeline
  executionMode: PARALLEL
  triggers:
    - provider: CodeConnection
      gitConfiguration:
        sourceActionName: ApplicationSource
        push:
          - filePaths:
              includes:
                - projectA/**
                - common/**/*.js
              excludes:
                - '**/README.md'
                - '**/LICENSE'
                - '**/CONTRIBUTING.md'
            branches:
              includes:
                - feature/**
                - release/**
              excludes:
                - mainline
          - tags:
              includes:
                - release-v0
                - release-v1
              excludes:
                - release-v2
        pullRequest:
          - events:
              - CLOSED
            branches:
              includes:
                - feature/**
                - release/**
              excludes:
                 - mainline
            filePaths:
              includes:
                 - projectA/**
```



Add trigger to turn off change detection

Triggers allow you to configure your pipeline to start on a particular event type, such as a code push or pull request. Triggers are configurable for source actions with connections that use the CodeStarSourceConnection action in CodePipeline, such as GitHub, Bitbucket, and GitLab.

Adding a trigger to turn off change detection (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit. Otherwise, use these steps on the pipeline creation wizard.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose the source action you want to edit. Choose **Edit triggers**. Choose to add a trigger.
- 5. In **Trigger type**, choose **Do not detect changes**.

Start and stop pipelines manually

You can use the Amazon CodePipeline console or the Amazon CLI to manually start and stop pipelines. There are automated methods for starting pipelines with event-based change detection as detailed in, or trigger configuration as detailed in .

Topics

- Start a pipeline in CodePipeline
- Stop a pipeline execution in CodePipeline

Start a pipeline in CodePipeline

Each pipeline execution can be started based on a different trigger. Each pipeline execution can have a different type of trigger, depending on how the pipeline is started. The trigger type for each execution is shown in the execution history for a pipeline. Trigger types can depend on the source action provider as follows:

🚯 Note

You cannot specify more than one trigger per source action.

- **Pipeline creation**: When a pipeline is created, a pipeline execution starts automatically. This is the CreatePipeline trigger type in the **Execution history**.
- **Changes on revised objects**: This category represents the PutActionRevision trigger type in the **Execution history**.
- Change detection on branch and commit for a code push: This category represents the CloudWatchEvent trigger type in the Execution history. When a change is detected to a source commit and branch in the source repository, your pipeline starts. This trigger type uses automated change detection. The source action providers that use this trigger type are S3 and CodeCommit. This type is also used for a schedule that starts your pipeline. See <u>Start a pipeline</u> on a schedule.
- **Polling for source changes**: This category represents the PollForSourceChanges trigger type in the **Execution history**. When a change is detected to a source commit and branch in the source repository through polling, your pipeline starts. This trigger type is not recommended and

should be migrated to use automated change detection. The source action providers that use this trigger type are S3 and CodeCommit.

- Webhook events for third-party sources: This category represents the Webhook trigger type in the Execution history. When a change is detected by a webhook event, your pipeline starts. This trigger type uses automated change detection. The source action providers that use this trigger type are connections configured for code push (Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com, and GitLab self-managed).
- WebhookV2 events for third-party sources: This category represents the WebhookV2 trigger type in the Execution history. This type is for executions that are triggered based on triggers defined in the pipeline definition. When a release with a specified Git tag is detected, your pipeline starts. You can use Git tags to mark a commit with a name or other identifier that helps other repository users understand its importance. You can also use Git tags to identify a particular commit in the history of a repository. This trigger type disables automated change detection. The source action providers that use this trigger type are connections configured for Git tags (Bitbucket Cloud, GitHub, GitHub Enterprise Server, and GitLab.com).
- Manually starting a pipeline: This category represents the StartPipelineExecution trigger type in the Execution history. You can use the console or the Amazon CLI to start a pipeline manually. For information, see <u>Start a pipeline manually</u>.
- RollbackStage: This category represents the RollbackStage trigger type in the Execution history. You can use the console or the Amazon CLI to roll back a stage manually or automatically. For information, see Configuring stage rollback.

When you add a source action to your pipeline that uses automated change detection trigger types, the actions work with additional resources. Creating each source action is detailed in separate sections due to these additional resources for change detection. For details about each source provider and the change detection methods required for automated change detection, see <u>Source</u> actions and change detection methods.

Topics

- Start a pipeline manually
- Start a pipeline on a schedule
- Start a pipeline with a source revision override

Start a pipeline manually

By default, a pipeline starts automatically when it is created and any time a change is made in a source repository. However, you might want to rerun the most recent revision through the pipeline a second time. You can use the CodePipeline console or the Amazon CLI and **start-pipeline-execution** command to manually rerun the most recent revision through your pipeline.

Topics

- Start a pipeline manually (console)
- Start a pipeline manually (CLI)

Start a pipeline manually (console)

To manually start a pipeline and run the most recent revision through a pipeline

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. In **Name**, choose the name of the pipeline you want to start.
- 3. On the pipeline details page, choose **Release change**. If the pipeline is configured to pass parameters (pipeline variables), then choosing **Release change** opens the **Release change** window. In **Pipeline variables**, in the field or fields for the variables at the pipeline level, enter the value or values you want to pass for this pipeline execution. For more information, see Variables reference.

This starts the most recent revision available in each source location specified in a source action through the pipeline.

Start a pipeline manually (CLI)

To manually start a pipeline and run the most recent version of an artifact through a pipeline

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the **start-pipeline-execution** command, specifying the name of the pipeline you want to start. For example, to start running the last change through a pipeline named *MyFirstPipeline*: aws codepipeline start-pipeline-execution --name MyFirstPipeline

To start a pipeline where variables are configured at the pipeline level, use the **start-pipelineexecution** command with the optional **--variables** argument to start the pipeline and add the variables that will be used in the execution. For example, to add a variable var1 with a value of 1, use the following command:

```
aws codepipeline start-pipeline-execution --name MyFirstPipeline --variables
name=var1,value=1
```

2. To verify success, view the returned object. This command returns an execution ID, similar to the following:

```
{
    "pipelineExecutionId": "c53dbd42-This-Is-An-Example"
}
```

Note

After you have started the pipeline, you can monitor its progress in the CodePipeline console or by running the **get-pipeline-state** command. For more information, see View pipelines (console) and View pipeline details and history (CLI).

Start a pipeline on a schedule

You can set up a rule in EventBridge to start a pipeline on a schedule.

Create an EventBridge rule that schedules your pipeline to start (console)

To create an EventBridge rule with a schedule as the event source

- 1. Open the Amazon EventBridge console at <u>https://console.amazonaws.cn/events/</u>.
- 2. In the navigation pane, choose **Rules**.
- 3. Choose **Create rule**, and then under **Rule detail**, choose **Schedule**.
- 4. Set up the schedule using a fixed rate or expression. For information, see <u>Schedule Expression</u> for Rules.

5. In Targets, choose CodePipeline.

6. Enter the pipeline ARN for the pipeline execution for this schedule.

í) Note

You can find the pipeline ARN under **Settings** in the console. See <u>View the pipeline</u> ARN and service role ARN (console).

- 7. Choose one of the following to create or specify an IAM service role that gives EventBridge permissions to invoke the target associated with your EventBridge rule (in this case, the target is CodePipeline).
 - Choose **Create a new role for this specific resource** to create a service role that grants EventBridge permissions to start your pipeline executions.
 - Choose **Use existing role** to enter a service role that grants EventBridge permissions to start your pipeline executions.
- 8. Choose **Configure details**.
- 9. On the **Configure rule details** page, enter a name and description for the rule, and then choose **State** to enable the rule.
- 10. If you're satisfied with the rule, choose **Create rule**.

Create an EventBridge rule that schedules your pipeline to start (CLI)

To use the Amazon CLI to create a rule, call the **put-rule** command, specifying:

- A name that uniquely identifies the rule you are creating. This name must be unique across all of the pipelines you create with CodePipeline associated with your Amazon account.
- The schedule expression for the rule.

To create an EventBridge rule with a schedule as the event source

 Call the **put-rule** command and include the --name and --schedule-expression parameters.

Examples:

The following sample command uses **--schedule-expression** to create a rule called MyRule2 that filters EventBridge on a schedule.

```
aws events put-rule --schedule-expression 'cron(15 10 ? * 6L 2002-2005)' --name
MyRule2
```

- 2. To add CodePipeline as a target, call the **put-targets** command and include the following parameters:
 - The --rule parameter is used with the rule_name you created by using **put-rule**.
 - The --targets parameter is used with the list Id of the target in the list of targets and the ARN of the target pipeline.

The following sample command specifies that for the rule called MyCodeCommitRepoRule, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The sample command also specifies an example ARN for the pipeline. The pipeline starts when something changes in the repository.

```
aws events put-targets --rule MyCodeCommitRepoRule --targets
Id=1,Arn=arn:aws:codepipeline:us-west-2:80398EXAMPLE:TestPipeline
```

- 3. Grant permissions for EventBridge to use CodePipeline to invoke the rule. For more information, see Using resource-based policies for Amazon EventBridge.
 - a. Use the following sample to create the trust policy to allow EventBridge to assume the service role. Name it trustpolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "events.amazonaws.com"
        },
        "Action": "sts:AssumeRole"
        }
   ]
}
```

```
aws iam create-role --role-name Role-for-MyRule --assume-role-policy-document
file://trustpolicyforEB.json
```

c. Create the permissions policy JSON as shown in this sample for the pipeline named MyFirstPipeline. Name the permissions policy permissionspolicyforEB.json.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:StartPipelineExecution"
        ],
        "Resource": [
              "arn:aws:codepipeline:us-west-2:80398EXAMPLE:MyFirstPipeline"
        ]
        }
    }
}
```

d. Use the following command to attach the new CodePipeline-Permissions-Policyfor-EB permissions policy to the Role-for-MyRule role you created.

aws iam put-role-policy --role-name Role-for-MyRule --policy-name CodePipeline-Permissions-Policy-For-EB --policy-document file://permissionspolicyforCWE.json

Start a pipeline with a source revision override

You can use overrides to start a pipeline with a specific source revision ID that you provide for the pipeline execution. For example, if you want to start a pipeline that will process a specific commit ID from your CodeCommit source, you can add the commit ID as an override when you start your pipeline.

(i) Note

You can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and EventBridge resources</u>, <u>Connecting to Amazon</u> <u>S3 source actions with a source enabled for events</u>, or <u>CodeCommit source actions and EventBridge</u>.

There are four types of source revision for revisionType:

- COMMIT_ID
- IMAGE_DIGEST
- S3_OBJECT_VERSION_ID
- S3_OBJECT_KEY

i Note

For the COMMIT_ID and IMAGE_DIGEST types of source revisions, the source revision ID applies to all content in the repository, across all branches.

🚯 Note

For the S3_OBJECT_VERSION_ID and S3_OBJECT_KEY types of source revisions, either of the types can be used independently, or they can be used together to override the source with a specific ObjectKey and VersionID. For S3_OBJECT_KEY, the configuration parameter AllowOverrideForS3ObjectKey needs to be set to true. For more information on S3 source configuration parameters, see <u>Configuration parameters</u>.

Topics

- Start a pipeline with a source revision override (console)
- Start a pipeline with a source revision override (CLI)

Start a pipeline with a source revision override (console)

To manually start a pipeline and run the most recent revision through a pipeline

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. In Name, choose the name of the pipeline you want to start.
- 3. On the pipeline details page, choose Release change. Choosing Release change opens the Release change window. For Source revision override, choose the arrow to expand the field. In Source, enter the source revision ID. For example, if your pipeline has a CodeCommit source, choose the commit ID from the field that you want to use.

Release change	×
 Source revision override A source revision is the version with all the changes to your application code, or for the pipeline execution. Choose the source revision, or version of your source changes that you want to run in the pipeline execution. Source Commit ID 	
Q	
Cancel	Release

Start a pipeline with a source revision override (CLI)

To manually start a pipeline and run the specified source revision ID for an artifact through a pipeline

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the start-pipeline-execution command, specifying the name of the pipeline you want to start. You also use the --source-revisions argument to provide the source revision ID. The source revision is made up of the actionName, revisionType, and revisionValue. Valid revisionType values are COMMIT_ID | IMAGE_DIGEST | S3_OBJECT_VERSION_ID | S3_OBJECT_KEY.

In the following example, to start running the specified change through a pipeline named **codecommit-pipeline**, the following command species a source action name of Source, a revision type of COMMIT_ID, and a commit ID of 78a25c18755ccac3f2a9eec099dEXAMPLE.

```
aws codepipeline start-pipeline-execution --name codecommit-pipeline --source-
revisions
actionName=Source,revisionType=COMMIT_ID,revisionValue=78a25c18755ccac3f2a9eec099dEXAMPLE
--region us-west-1
```

2. To verify success, view the returned object. This command returns an execution ID, similar to the following:

```
{
    "pipelineExecutionId": "c53dbd42-This-Is-An-Example"
}
```

í) Note

After you have started the pipeline, you can monitor its progress in the CodePipeline console or by running the **get-pipeline-state** command. For more information, see View pipelines (console) and View pipeline details and history (CLI).

Stop a pipeline execution in CodePipeline

When a pipeline execution starts to run through a pipeline, it enters one stage at a time and locks the stage while all action executions in the stage are running. These in-progress actions must be handled in a way so that, when the pipeline execution is stopped, the actions are either allowed to complete or abandoned.

There are two ways to stop a pipeline execution:

• **Stop and wait**: Amazon CodePipeline waits to stop the execution until all in-progress actions are completed (that is, the actions have a Succeeded or Failed status). This option preserves in-progress actions. The execution is in a Stopping state until the in-progress actions are

complete. Then the execution is in a Stopped state. The stage unlocks after the actions are complete.

If you choose to stop and wait, and you change your mind while your execution is still in a Stopping state, you can then choose to abandon.

• **Stop and abandon**: Amazon CodePipeline stops the execution without waiting for in-progress actions to complete. The execution is in a Stopping state for a very short time while the in-progress actions are abandoned. After the execution is stopped, the action execution is in an Abandoned state while the pipeline execution is in a Stopped state. The stage unlocks.

For a pipeline execution in a Stopped state, the actions in the stage where the execution stopped can be retried.

🔥 Warning

This option can lead to failed tasks or out of sequence tasks.

Topics

- Stop a pipeline execution (console)
- Stop an Inbound Execution (Console)
- Stop a pipeline execution (CLI)
- Stop an Inbound Execution (CLI)

Stop a pipeline execution (console)

You can use the console to stop a pipeline execution. Choose an execution, and then choose the method for stopping the pipeline execution.

Note

You can also stop a pipeline execution that is an inbound execution. To learn more about stopping an inbound execution, see <u>Stop an Inbound Execution (Console)</u>.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

2. Do one of the following:

🚯 Note

Before you stop an execution, we recommend that you disable the transition in front of the stage. This way, when the stage unlocks due to the stopped execution, the stage does not accept a subsequent pipeline execution.

- In **Name**, choose the name of the pipeline with the execution you want to stop. On the pipeline details page, choose **Stop execution**.
- Choose View history. On the history page, choose Stop execution.
- 3. On the **Stop execution** page, under **Select execution**, choose the execution you want to stop.

🚯 Note

The execution is displayed only if it is still in progress. Executions that are already complete are not displayed.

Stop execution	×
Select execution Choose the pipeline execution you war	nt to stop.
Choose a stop mode for the exect If you choose to stop and wait, and you state, you can choose to abandon. Stop and wait Wait until all in-progress actions are complete.	ution u change your mind while your execution is still in a stopping O Stop and abandon Don't wait until the in- progress actions are complete. Warning: This option can lead to failed actions.
Stop execution comments - optio	nal
Cancel Stop	

- 4. Under **Select an action to apply to execution**, choose one of the following:
 - To make sure the execution does not stop until all in-progress actions are complete, choose **Stop and wait**.



You cannot choose to stop and wait if the execution is already in a **Stopping** state, but you can choose to stop and abandon.

• To stop without waiting for in-progress actions to complete, choose **Stop and abandon**.

🔥 Warning

This option can lead to failed tasks or out of sequence tasks.

- 5. (Optional) Enter comments. These comments, along with the execution status, are displayed on the history page for the execution.
- 6. Choose **Stop**.

🔥 Important

This action cannot be undone.

- 7. View the execution status in the pipeline visualization as follows:
 - If you chose to stop and wait, the selected execution continues until in-progress actions are completed.
 - The success banner message is displayed at the top of the console.
 - In the current stage, in-progress actions continue in an InProgress state. While the actions are in progress, the pipeline execution is in a Stopping state.

After the actions complete (that is, the action fails or succeeds), the pipeline execution changes to a Stopped state and the action changes to a Failed or Succeeded state. You can also view the action state on the execution details page. You can view the execution status on the execution history page or the execution details page.

- The pipeline execution changes to a Stopping state briefly, and then it changes to a Stopped state. You can view the execution status on the execution history page or the execution details page.
- If you chose to stop and abandon, the execution does not wait for in-progress actions to complete.
 - The success banner message is displayed at the top of the console.
 - In the current stage, in-progress actions change to a status of Abandoned. You can also view the action status on the execution details page.
 - The pipeline execution changes to a Stopping state briefly, and then it changes to a Stopped state. You can view the execution status on the execution history page or the execution details page.

You can view the pipeline execution status in the execution history view and the detailed history view.

Stop an Inbound Execution (Console)

You can use the console to stop an inbound execution. An inbound execution is a pipeline execution that is waiting to enter a stage where the transition has been disabled. When the transition is enabled, an inbound execution that is InProgress continues to enter the stage. An inbound execution that is Stopped does not enter the stage.

Note

After an inbound execution has been stopped, it cannot be retried.

If you do not see an inbound execution, then there are no pending executions at a disabled stage transition.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account will be displayed.

- 2. Choose the name of the pipeline for which you want to stop the inbound execution, Do one of the following:
 - In the Pipeline view, choose the inbound execution ID and then choose to stop the execution.
 - Choose the pipeline and choose **View history**. In the execution history, choose the inbound execution ID and then choose to stop the execution.
- 3. In the **Stop execution** modal, follow the steps in the section above to select the execution ID and specify the stop method.

Use the **get-pipeline-state** command to view the status of the inbound execution.

Stop a pipeline execution (CLI)

To use the Amazon CLI to manually stop a pipeline, use the **stop-pipeline-execution** command with the following parameters:

- Execution ID (required)
- Comments (optional)

- Pipeline name (required)
- Abandon flag (optional, the default is false)

Command format:

```
aws codepipeline stop-pipeline-execution --pipeline-name Pipeline_Name --pipeline-
execution-id Execution_ID [--abandon | --no-abandon] [--reason STOP_EXECUTION_REASON]
```

- 1. Open a terminal (Linux, OS X, or Unix) or command prompt (Windows).
- 2. To stop a pipeline execution, choose one of the following:
 - To make sure the execution does not stop until all in-progress actions are complete, choose to stop and wait. You can do this by including the no-abandon parameter. If you do not specify the parameter, the command defaults to stop and wait. Use the Amazon CLI to run the stop-pipeline-execution command, specifying the name of the pipeline and the execution ID. For example, to stop a pipeline named *MyFirstPipeline* with the stop and wait option specified:

```
aws codepipeline stop-pipeline-execution --pipeline-name MyFirstPipeline --
pipeline-execution-id d-EXAMPLE --no-abandon
```

For example, to stop a pipeline named *MyFirstPipeline*, defaulting to the stop and wait option, and choosing to include comments:

```
aws codepipeline stop-pipeline-execution --pipeline-name MyFirstPipeline --
pipeline-execution-id d-EXAMPLE --reason "Stopping execution after the build
action is done"
```

Note

You cannot choose to stop and wait if the execution is already in a **Stopping** state. You can choose to stop and abandon an execution that is already in a **Stopping** state.

To stop without waiting for in-progress actions to complete, choose to stop and abandon.
 Include the **abandon** parameter. Use the Amazon CLI to run the **stop-pipeline-execution** command, specifying the name of the pipeline and the execution ID.

User Guide

For example, to stop a pipeline named *MyFirstPipeline*, specifying the abandon option, and choosing to include comments:

```
aws codepipeline stop-pipeline-execution --pipeline-name MyFirstPipeline --
pipeline-execution-id d-EXAMPLE --abandon --reason "Stopping execution for a bug
fix"
```

Stop an Inbound Execution (CLI)

You can use the CLI to stop an inbound execution. An inbound execution is a pipeline execution that is waiting to enter a stage where the transition has been disabled. When the transition is enabled, an inbound execution that is InProgress continues to enter the stage. An inbound execution that is Stopped does not enter the stage.

Note

After an inbound execution has been stopped, it cannot be retried.

If you do not see an inbound execution, then there are no pending executions at a disabled stage transition.

To use the Amazon CLI to manually stop an inbound execution, use the **stop-pipeline-execution** command with the following parameters:

- Inbound Execution ID (required)
- Comments (optional)
- Pipeline name (required)
- Abandon flag (optional, the default is false)

Command format:

```
aws codepipeline stop-pipeline-execution --pipeline-name Pipeline_Name --
pipeline-execution-id Inbound_Execution_ID [--abandon | --no-abandon] [--
reason STOP_EXECUTION_REASON]
```

Follow the steps in the procedure above to enter the command and specify the stop method.

Use the **get-pipeline-state** command to view the status of the inbound execution.

View history and set the mode for pipeline executions

To analyse pipeline progress, you can view pipeline and action execution history. To configure the release method for processing pipeline executions, set the execution mode.

Topics

- View executions in CodePipeline
- Set or change the pipeline execution mode

View executions in CodePipeline

You can use the Amazon CodePipeline console or the Amazon CLI to view execution status, view execution history, and retry failed stages or actions.

Topics

- View pipeline execution history (console)
- View execution status (console)
- View an inbound execution (Console)
- View pipeline execution source revisions (console)
- View action executions (console)
- View action artifacts and artifact store information (console)
- View pipeline details and history (CLI)

View pipeline execution history (console)

You can use the CodePipeline console to view a list of all of the pipelines in your account. You can also view details for each pipeline, including when actions last ran in the pipeline, whether a transition between stages is enabled or disabled, whether any actions have failed, and other information. You can also view a history page that shows details for all pipeline executions for which history has been recorded.

🚯 Note

When switching between specific execution modes, the pipeline view and history might change. For more information, see Set or change the pipeline execution mode.

Execution history is retained for up to 12 months.

You can use the console to view the history of executions in a pipeline, including status, source revisions, and timing details for each execution.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed, along with their status.

- 2. In **Name**, choose the name of the pipeline.
- 3. Choose View history.

🚺 Note

For a pipeline in PARALLEL execution mode, the main pipeline view does not show the pipeline structure or in-progress executions. For a pipeline in PARALLEL execution mode, you access the pipeline structure by choosing the ID for the execution you want to view from the execution history page. Choose **History** in the left navigation, choose the execution ID for the parallel execution, and then view the pipeline on the **Visualization** tab.

xect	ution history In	ifo		Rerun St	top execution	View details	Release change
Q							< 1 > @
	Execution ID	Status	Source revisions	Trigger	Started	Duration	Completed
)	33bdf70c Rollback	⊘ Succeeded	Source – <u>73ae512c</u> : Added README.txt	-	Apr 16, 2024 2:51 AM (UTC-7:00)	1 second	Apr 16, 2024 2:51 AM (UTC-7:00)
)	3f658bd1 Rollback	⊘ Succeeded	Source – <u>73ae512c</u> : Added README.txt	-	Apr 16, 2024 2:16 AM (UTC-7:00)	1 second	Apr 16, 2024 2:16 AM (UTC-7:00)
)	4f47bed9	⊘ Succeeded	Source – <u>73ae512c</u> : Added README.txt	StartPipelineExec ution	Apr 16, 2024 2:14 AM (UTC-7:00)	5 seconds	Apr 16, 2024 2:14 AM (UTC-7:00)
	eb7ebd36		Source – 73ae512c:		Apr 16, 2024		Apr 16, 2024

- 4. View the status, source revisions, change details, and triggers related to each execution for your pipeline. Pipeline executions that have been rolled back will show the execution type **Rollback** on the details screen in the console. For the failed execution that triggered the automatic rollback, the failed execution ID is shown.
- Choose an execution. The detail view shows execution details, the **Timeline** tab, the Visualization tab, and the Variables tab. Variable values for variables at the pipeline level are resolved at the time of pipeline execution and can be viewed in the execution history for each execution.

1 Note

Output variables from pipeline actions can be viewed on the Output variables tab under the history for each action execution.

View execution status (console)

You can view the pipeline status in **Status** on the execution history page. Choose an execution ID link, and then view the action status.

The following are valid states for pipelines, stages, and actions:

(i) Note

The following pipeline states also apply to a pipeline execution that is an inbound execution. To view an inbound execution and its status, see <u>View an inbound execution</u> (Console).

Pipeline-level states

Pipeline state	Description	
InProgress	The pipeline execution is currently running.	
Stopping	The pipeline execution is stopping due to a request to either stop and wait or stop and abandon the pipeline execution.	
Stopped	The stopping process is complete, and the pipeline execution is stopped.	
Succeeded	The pipeline execution was completed successfully.	
Superseded	While this pipeline execution was waiting for the next stage to be completed, a newer pipeline execution advanced and continued through the pipeline instead.	
Failed	The pipeline execution was not completed successfully.	

Stage-level states

Stage state	Description
InProgress	The stage is currently running.
Stopping	The stage execution is stopping due to a request to either stop and wait or stop and abandon the pipeline execution.
Stopped	The stopping process is complete, and the stage execution is stopped.
Succeeded	The stage was completed successfully.

Stage state	Description
Failed	The stage was not completed successfully.

Action-level states

Action state	Description
InProgress	The action is currently running.
Abandoned	The action is abandoned due to a request to stop and abandon the pipeline execution.
Succeeded	The action was completed successfully.
Failed	For approval actions, the FAILED state means the action was either rejected by the reviewer or failed due to an incorrect action configura tion.

View an inbound execution (Console)

You can use the console to view the status and details for an inbound execution. When the transition is enabled or the stage becomes available, an inbound execution that is InProgress continues and enters the stage. An inbound execution with a Stopped status does not enter the stage. An inbound execution status changes to Failed if the pipeline is edited. When you edit a pipeline, all in-progress executions do not continue, and the execution status changes to Failed.

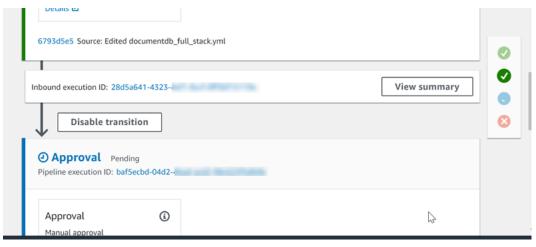
If you do not see an inbound execution, then there are no pending executions at a disabled stage transition.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account will be displayed.

2. Choose the name of the pipeline for which you want to view the inbound execution, Do one of the following:

• Choose View. In the pipeline diagram, in the **Inbound execution ID** field in front of your disabled transition, you can view the inbound execution ID.



Choose **View summary** to see execution details, such as the execution ID, source trigger, and the name of the next stage.

• Choose the pipeline and choose View history.

View pipeline execution source revisions (console)

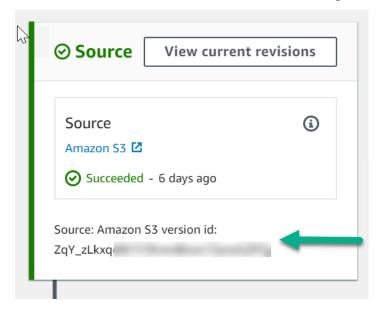
You can view details about source artifacts (output artifact that originated in the first stage of a pipeline) that are used in an execution of a pipeline. The details include identifiers, such as commit IDs, check-in comments, and, when you use the CLI, version numbers of pipeline build actions. For some revision types, you can view and open the URL of the commit. Source revisions are made up of the following:

- **Summary**: Summary information about the most recent revision of the artifact. For GitHub and CodeCommit repositories, the commit message. For Amazon S3 buckets or actions, the user-provided content of a codepipeline-artifact-revision-summary key specified in the object metadata.
- revisionUrl: The revision URL for the artifact revision (for example, the external repository URL).
- revisionId: The revision ID for the artifact revision. For example, for a source change in a CodeCommit or GitHub repository, this is the commit ID. For artifacts stored in GitHub or CodeCommit repositories, the commit ID is linked to a commit details page.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon Web Services accountwill be displayed.

- 2. Choose the name of the pipeline for which you want to view source revision details. Do one of the following:
 - Choose View history. In Source revisions, the source change for each execution is listed.
 - Locate an action for which you want to view source revision details, and then find the revision information at the bottom of its stage:



Choose **View current revisions** to view source information. With the exception of artifacts stored in Amazon S3 buckets, identifiers such as commit IDs in this information detail view are linked to source information pages for the artifacts.

"Source" current revisions These are the source artifact changes that started the current pipeline execution.	×
Source Amazon S3 version id: ZqY_zLkx Execution ID 4e49e3b7-7dcc-4d93-b91a-	
Done	

View action executions (console)

You can view action details for a pipeline, such as action execution ID, input artifacts, output artifacts, and status. You can view action details by choosing a pipeline in the console and then choosing an execution ID.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed.

- Choose the name of the pipeline for which you want to view action details, and then choose View history.
- 3. In **Execution ID**, choose the execution ID for which you want to view action execution details.
- 4. You can view the following information on the **Timeline** tab:
 - a. In **Action name**, choose the link to open a details page for the action where you can view status, stage name, action name, configuration data, and artifact information.
 - b. In **Provider**, choose the link to view the action provider details. For example, in the preceding example pipeline, if you choose CodeDeploy in either the Staging or Production stages, the CodeDeploy console page for the CodeDeploy application configured for that stage is displayed.

View action artifacts and artifact store information (console)

You can view input and output artifact details for an action. You can also choose a link that takes you to the artifact information for that action. Because the artifact store uses versioning, each action execution has a unique input and output artifact location.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed.

- 2. Choose the name of the pipeline for which you want to view action details, and then choose **View history**.
- 3. In **Execution ID**, choose the execution ID for which you want to view action details.
- 4. On the **Timeline** tab, in **Action name**, choose the link to open a details page for the action.

- 5. On the details page, on the **Execution** tab, view the status and timing of the action execution.
- 6. On the **Configuration** tab, view the resource configuration for the action (for example, the CodeBuild build project name).
- 7. On the **Artifacts** tab, view the artifact details in **Artifact type** and **Artifact provider**. Choose the link under **Artifact name** to view the artifacts in the artifact store.
- 8. On the **Output variables** tab, view the resolved variables from actions in the pipeline for the action execution.

View pipeline details and history (CLI)

You can run the following commands to view details about your pipelines and pipeline executions:

- **list-pipelines** command to view a summary of all of the pipelines associated with your Amazon Web Services account.
- get-pipeline command to review details of a single pipeline.
- list-pipeline-executions to view summaries of the most recent executions for a pipeline.
- **get-pipeline-execution** to view information about an execution of a pipeline, including details about artifacts, the pipeline execution ID, and the name, version, and status of the pipeline.
- get-pipeline-state command to view pipeline, stage, and action status.
- list-action-executions to view action execution details for a pipeline.

Topics

- View execution history with list-pipeline-executions (CLI)
- <u>View pipeline state with get-pipeline-state (CLI)</u>
- View inbound execution status with get-pipeline-state (CLI)
- View status and source revisions with get-pipeline-execution (CLI)
- View action executions with list-action-executions (CLI)

View execution history with list-pipeline-executions (CLI)

You can view pipeline execution history.

To view details about past executions of a pipeline, run the <u>list-pipeline-executions</u> command, specifying the unique name of the pipeline. For example, to view details about the current state of a pipeline named *MyFirstPipeline*, enter the following:

```
aws codepipeline list-pipeline-executions --pipeline-name MyFirstPipeline
```

This command returns summary information about all pipeline executions for which history has been recorded. The summary includes start and end times, duration, and status.

Pipeline executions that have been rolled back will show the execution type Rollback. For the failed execution that triggered the automatic rollback, the failed execution ID is shown.

The following example shows the returned data for a pipeline named *MyFirstPipeline* that has had three executions:

```
{
    "pipelineExecutionSummaries": [
        {
            "pipelineExecutionId": "eb7ebd36-353a-4551-90dc-18ca5EXAMPLE",
            "status": "Succeeded",
            "startTime": "2024-04-16T09:00:28.185000+00:00",
            "lastUpdateTime": "2024-04-16T09:00:29.665000+00:00",
            "sourceRevisions": [
                {
                    "actionName": "Source",
                    "revisionId": "revision_ID",
                    "revisionSummary": "Added README.txt",
                    "revisionUrl": "console-URL"
                }
            ],
            "trigger": {
                "triggerType": "StartPipelineExecution",
                "triggerDetail": "trigger_ARN"
            },
            "executionMode": "SUPERSEDED"
        },
        {
            "pipelineExecutionId": "fcd61d8b-4532-4384-9da1-2aca1EXAMPLE",
            "status": "Succeeded",
            "startTime": "2024-04-16T08:58:56.601000+00:00",
            "lastUpdateTime": "2024-04-16T08:59:04.274000+00:00",
            "sourceRevisions": [
```

```
{
    "actionName": "Source",
    "revisionId": "revision_ID",
    "revisionSummary": "Added README.txt",
    "revisionUrl": "console_URL"
    }
],
"trigger": {
    "triggerType": "StartPipelineExecution",
    "triggerDetail": "trigger_ARN"
},
"executionMode": "SUPERSEDED"
}
```

To view more details about a pipeline execution, run the <u>get-pipeline-execution</u>, specifying the unique ID of the pipeline execution. For example, to view more details about the first execution in the previous example, enter the following:

```
aws codepipeline get-pipeline-execution --pipeline-name MyFirstPipeline --pipeline-execution-id 7cf7f7cb-3137-539g-j458-d7eu3EXAMPLE
```

This command returns summary information about an execution of a pipeline, including details about artifacts, the pipeline execution ID, and the name, version, and status of the pipeline.

The following example shows the returned data for a pipeline named *MyFirstPipeline*:

}

}

View pipeline state with get-pipeline-state (CLI)

You can use the CLI to view pipeline, stage, and action status.

 To view details about the current state of a pipeline, run the <u>get-pipeline-state</u> command, specifying the unique name of the pipeline. For example, to view details about the current state of a pipeline named <u>MyFirstPipeline</u>, enter the following:

```
aws codepipeline get-pipeline-state --name MyFirstPipeline
```

This command returns the current status of all stages of the pipeline and the status of the actions in those stages.

The following example shows the returned data for a three-stage pipeline named *MyFirstPipeline*, where the first two stages and actions show success, the third shows failure, and the transition between the second and third stages is disabled:

```
{
    "updated": 1427245911.525,
    "created": 1427245911.525,
    "pipelineVersion": 1,
    "pipelineName": "MyFirstPipeline",
    "stageStates": [
        {
            "actionStates": [
                {
                     "actionName": "Source",
                     "entityUrl": "https://console.aws.amazon.com/s3/home?#",
                     "latestExecution": {
                         "status": "Succeeded",
                         "lastStatusChange": 1427298837.768
                    }
                }
            ],
            "stageName": "Source"
        },
        {
```

User Guide

```
"actionStates": [
                {
                    "actionName": "Deploy-CodeDeploy-Application",
                    "entityUrl": "https://console.aws.amazon.com/codedeploy/home?
#",
                    "latestExecution": {
                        "status": "Succeeded",
                        "lastStatusChange": 1427298939.456,
                         "externalExecutionUrl": "https://console.aws.amazon.com/?
#",
                         "externalExecutionId": ""c53dbd42-This-Is-An-Example"",
                        "summary": "Deployment Succeeded"
                    }
                }
            ],
            "inboundTransitionState": {
                "enabled": true
            },
            "stageName": "Staging"
        },
        {
            "actionStates": [
                {
                    "actionName": "Deploy-Second-Deployment",
                    "entityUrl": "https://console.aws.amazon.com/codedeploy/home?
#",
                    "latestExecution": {
                         "status": "Failed",
                        "errorDetails": {
                             "message": "Deployment Group is already deploying
 deployment ....",
                            "code": "JobFailed"
                        },
                        "lastStatusChange": 1427246155.648
                    }
                }
            ],
            "inboundTransitionState": {
                "disabledReason": "Disabled while I investigate the failure",
                "enabled": false,
                "lastChangedAt": 1427246517.847,
                "lastChangedBy": "arn:aws:iam::80398EXAMPLE:user/CodePipelineUser"
            },
            "stageName": "Production"
```

}] }

View inbound execution status with get-pipeline-state (CLI)

You can use the CLI to view inbound execution status. When the transition is enabled or the stage becomes available, an inbound execution that is InProgress continues and enters the stage. An inbound execution with a Stopped status does not enter the stage. An inbound execution status changes to Failed if the pipeline is edited. When you edit a pipeline, all in-progress executions do not continue, and the execution status changes to Failed.

To view details about the current state of a pipeline, run the <u>get-pipeline-state</u> command, specifying the unique name of the pipeline. For example, to view details about the current state of a pipeline named *MyFirstPipeline*, enter the following:

```
aws codepipeline get-pipeline-state --name MyFirstPipeline
```

This command returns the current status of all stages of the pipeline and the status of the actions in those stages. The output also shows pipeline execution ID in each stage, and whether there is an inbound execution ID for a stage with a disabled transition.

The following example shows the returned data for a two-stage pipeline named *MyFirstPipeline*, where the first stage shows an enabled transition and a successful pipeline execution, and the second stage, named Beta, shows a disabled transition and an inbound execution ID. The inbound execution can have an InProgress, Stopped, or FAILED state.

```
"actionName": "SourceAction",
                    "currentRevision": {
                         "revisionId": "PARcnxX u0SMRBnKh83pHL09.zPRLLMu"
                    },
                    "latestExecution": {
                         "actionExecutionId": "14c8b311-0e34-4bda-EXAMPLE",
                        "status": "Succeeded",
                        "summary": "Amazon S3 version id: PARcnxX_u0EXAMPLE",
                        "lastStatusChange": 1586273484.137,
                        "externalExecutionId": "PARcnxX_u0EXAMPLE"
                    },
                    "entityUrl": "https://console.aws.amazon.com/s3/home?#"
                }
            ],
            "latestExecution": {
                "pipelineExecutionId": "27a47e06-6644-42aa-EXAMPLE",
                "status": "Succeeded"
            }
        },
        {
            "stageName": "Beta",
            "inboundExecution": {
                "pipelineExecutionId": "27a47e06-6644-42aa-958a-EXAMPLE",
                "status": "InProgress"
            },
            "inboundTransitionState": {
                "enabled": false,
                "lastChangedBy": "USER_ARN",
                "lastChangedAt": 1586273583.949,
                "disabledReason": "disabled"
            },
                    "currentRevision": {
            "actionStates": [
                {
                    "actionName": "BetaAction",
                    "latestExecution": {
                         "actionExecutionId": "a748f4bf-0b52-4024-98cf-EXAMPLE",
                        "status": "Succeeded",
                        "summary": "Deployment Succeeded",
                         "lastStatusChange": 1586272707.343,
                        "externalExecutionId": "d-KFGF3EXAMPLE",
                        "externalExecutionUrl": "https://us-
west-2.console.aws.amazon.com/codedeploy/home?#/deployments/d-KFGF3WTS2"
                    },
```

View status and source revisions with get-pipeline-execution (CLI)

You can view details about source artifacts (output artifacts that originated in the first stage of a pipeline) that are used in an execution of a pipeline. The details include identifiers, such as commit IDs, check-in comments, time since the artifact was created or updated and, when you use the CLI, version numbers of build actions. For some revision types, you can view and open the URL of the commit for the artifact version. Source revisions are made up of the following:

- **Summary**: Summary information about the most recent revision of the artifact. For GitHub and Amazon CodeCommit repositories, the commit message. For Amazon S3 buckets or actions, the user-provided content of a codepipeline-artifact-revision-summary key specified in the object metadata.
- **revisionUrl**: The commit ID for the artifact revision. For artifacts stored in GitHub or Amazon CodeCommit repositories, the commit ID is linked to a commit details page.

You can run the **get-pipeline-execution** command to view information about the most recent source revisions that were included in a pipeline execution. After you first run the **get-pipelinestate** command to get details about all stages in a pipeline, you identify the execution ID that applies to a stage for which you want source revision details. Then you use the execution ID in the **get-pipeline-execution** command. (Because stages in a pipeline might have been last successfully completed during different pipeline runs, they can have different execution IDs.) In other words, if you want to view details about artifacts currently in the Staging stage, run the **get-pipeline-state** command, identify the current execution ID of the Staging stage, and then run the **get-pipeline-execution** command using that execution ID.

To view status and source revisions in a pipeline

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the <u>get-pipeline-state</u> command. For a pipeline named *MyFirstPipeline*, you would enter:

```
aws codepipeline get-pipeline-state --name MyFirstPipeline
```

This command returns the most recent state of a pipeline, including the latest pipeline execution ID for each stage.

2. To view details about a pipeline execution, run the get-pipeline-execution command, specifying the unique name of the pipeline and the pipeline execution ID of the execution for which you want to view artifact details. For example, to view details about the execution of a pipeline named *MyFirstPipeline*, with the execution ID 3137f7cb-7cf7-039j-s83l-d7eu3EXAMPLE, you would enter the following:

```
aws codepipeline get-pipeline-execution --pipeline-name MyFirstPipeline --pipeline-
execution-id 3137f7cb-7cf7-039j-s83l-d7eu3EXAMPLE
```

This command returns information about each source revision that is part of the pipeline execution and identifying information about the pipeline. Only information about pipeline stages that were included in that execution are included. There might be other stages in the pipeline that were not part of that pipeline execution.

The following example shows the returned data for a portion of pipeline named *MyFirstPipeline*, where an artifact named "MyApp" is stored in a GitHub repository:

```
3.
```

```
"revisionSummary": "Updating the application for feature 12-4820",
                "revisionUrl": "https://api.github.com/repos/anycompany/MyApp/git/
commits/7636d59f3c461cEXAMPLE8417dbc6371"
            }
        ],
        "pipelineExecutionId": "3137f7cb-7cf7-039j-s83l-d7eu3EXAMPLE",
        "pipelineName": "MyFirstPipeline",
        "pipelineVersion": 2,
        "status": "Succeeded",
        "executionMode": "SUPERSEDED",
        "executionType": "ROLLBACK",
        "rollbackMetadata": {
            "rollbackTargetPipelineExecutionId": "4f47bed9-6998-476c-a49d-
e60beEXAMPLE"
         }
    }
}
```

View action executions with list-action-executions (CLI)

You can view action execution details for a pipeline, such as action execution ID, input artifacts, output artifacts, execution result, and status. You provide the Execution ID filter to return a listing of actions in a pipeline execution:

🚯 Note

Detailed execution history is available for executions run on or after February 21, 2019.

- To view action executions for a pipeline, do one of the following:
 - To view details for all action executions in a pipeline, run the **list-action-executions** command, specifying the unique name of the pipeline. For example, to view action executions in a pipeline named *MyFirstPipeline*, enter the following:

aws codepipeline list-action-executions --pipeline-name MyFirstPipeline

The following shows a portion of sample output for this command:

{

```
"actionExecutionDetails": [
       {
           "actionExecutionId": "ID",
           "lastUpdateTime": 1552958312.034,
           "startTime": 1552958246.542,
           "pipelineExecutionId": "Execution_ID",
           "actionName": "Build",
           "status": "Failed",
           "output": {
               "executionResult": {
                   "externalExecutionUrl": "Project_ID",
                   "externalExecutionSummary": "Build terminated with state:
FAILED",
                   "externalExecutionId": "ID"
               },
               "outputArtifacts": []
           },
           "stageName": "Beta",
           "pipelineVersion": 8,
           "input": {
               "configuration": {
                   "ProjectName": "java-project"
               },
               "region": "us-east-1",
               "inputArtifacts": [
                   {
                        "s3location": {
                            "bucket": "codepipeline-us-east-1-ID",
                            "key": "MyFirstPipeline/MyApp/Object.zip"
                       },
                       "name": "MyApp"
                   }
               ],
               "actionTypeId": {
                   "version": "1",
                   "category": "Build",
                   "owner": "AWS",
                   "provider": "CodeBuild"
               }
           }
       },
```

 To view all action executions in a pipeline execution, run the list-action-executions command, specifying the unique name of the pipeline and the execution ID. For example, to view action executions for an *Execution_ID*, enter the following:

```
aws codepipeline list-action-executions --pipeline-name MyFirstPipeline --filter
pipelineExecutionId=Execution_ID
```

• The following shows a portion of sample output for this command:

```
{
    "actionExecutionDetails": [
        {
            "stageName": "Beta",
            "pipelineVersion": 8,
            "actionName": "Build",
            "status": "Failed",
            "lastUpdateTime": 1552958312.034,
            "input": {
                "configuration": {
                     "ProjectName": "java-project"
                },
                "region": "us-east-1",
                "actionTypeId": {
                     "owner": "AWS",
                     "category": "Build",
                     "provider": "CodeBuild",
                     "version": "1"
                },
                "inputArtifacts": [
                    {
                         "s3location": {
                             "bucket": "codepipeline-us-east-1-ID",
                             "key": "MyFirstPipeline/MyApp/Object.zip"
                         },
                         "name": "MyApp"
                    }
                ]
            },
 . .
```

Set or change the pipeline execution mode

You can set the execution mode for your pipeline to specify how multiple executions are handled.

For more information about pipeline execution modes, see How pipeline executions work.

<u> Important</u>

For pipelines in PARALLEL mode, when editing the pipeline execution mode to QUEUED or SUPERSEDED, the pipeline state will not display the updated state as PARALLEL. For more information, see <u>Pipelines changed from PARALLEL mode will display a previous execution</u> mode.

🔥 Important

For pipelines in PARALLEL mode, when editing the pipeline execution mode to QUEUED or SUPERSEDED, the pipeline definition for the pipeline in each mode will not be updated. For more information, see <u>Pipelines in PARALLEL mode have an outdated pipeline definition if</u> edited when changing to QUEUED or SUPERSEDED mode.

A Important

For pipelines in PARALLEL mode, stage rollback is not available. Similarly, failure conditions with a rollback result type cannot be added to a PARALLEL mode pipeline.

Considerations for viewing execution modes

There are considerations for viewing pipelines in specific execution modes.

For SUPERSEDED and QUEUED modes, use the pipeline view to see in-progress executions, and click the execution ID to view details and history. For PARALLEL mode, click the execution ID to view the in-progress execution on the Visualization tab.

The following shows the view for SUPERSEDED mode in CodePipeline.

MyPipeline	♦ Notify ▼ Edit	Stop execution	Clone pipeline	Release change	
Pipeline type: V2 Execution mode: SUPERSEDED					
Source Succeeded Pipeline execution ID: <u>3ff0e57c-e595-407c-8668-</u>					
Source GitHub (Version 2)					
Succeeded - <u>1 minute ago</u> 77cc2e44					Ø
View details					
77cc2e44 🖸 Source: Merge pull request #5 from /feature-b	ranch (•••				
Disable transition					
Build In progress Pipeline execution ID: <u>3ff0e57c-e595-407c-866</u> 2					
Build					

The following shows the view for QUEUED mode in CodePipeline.

Source Succeeded			
peline execution ID: <u>100f7c0e-4545-4</u>	185a-88ea-(
Source			
GitHub (Version 2)			
77cc2e44			
view details			
cc2e44 🗹 Source: Merge pull request	#5 from /feature-branch (***]	
Disable transition			
Disable transition			
Disable transition			

The following shows the view for PARALLEL mode in CodePipeline.



Visualization Timeline	Variables Revisions	
Source Succeeded		
Source <u>GitHub (Version 2)</u> Succeeded - <u>Just now</u> View details		2
• Build In progress		
Build <u>AWS CodeBuild</u> <u> on progress - Just now</u> <u> View details</u>		

Considerations for switching between execution modes

The following are considerations for pipelines when changing the mode for the pipeline. When switching from one execution mode to another in **Edit** mode and then saving the change, certain views or states might adjust.

For example, when switching from PARALLEL mode to a QUEUED or SUPERSEDED mode, the execution started in PARALLEL mode will continue to run. These can be viewed on the execution history page. The pipeline view will show the execution that ran on QUEUED or SUPERSEDED mode earlier or an empty state otherwise.

As another example, when switching from QUEUED or SUPERSEDED to PARALLEL mode, you will no longer see the pipeline view/state page. To view an execution in PARALLEL mode, use the visualization tab on the execution details page. Executions started in SUPERSEDED or QUEUED mode will be cancelled.

The following table provides more detail.

Mode change	Pending and active execution details	Pipeline state details
SUPERSEDED to SUPERSEDE D / SUPERSEDED to QUEUED	 Active executions are cancelled after in-progress actions complete. Pending executions are cancelled. 	The pipeline state, such as cancelled , is preserved between the version of the first mode and the second mode.
QUEUED to QUEUED / QUEUED to SUPERSEDED	 Active executions are cancelled after in-progress actions complete. Pending executions are cancelled. 	The pipeline state, such as cancelled, is preserved between the version of the first mode and the second mode.
PARALLEL to PARALLEL	All executions are allowed to run independently of pipeline definition updates.	Empty. Parallel mode does not have a pipeline state.
SUPERSEDED to PARALLEL / QUEUED to PARALLEL	 Active executions are cancelled after in-progress actions complete. Pending executions are cancelled. 	Empty. Parallel mode does not have a pipeline state.

Set or change the pipeline execution mode (console)

You can use the console to set the pipeline execution mode.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to edit.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, choose **Edit: Pipeline properties**.

- Superseded
- Queued (Pipeline type V2 required)
- Parallel (Pipeline type V2 required)
- 6. On the **Edit** page, choose **Done**.

Set the pipeline execution mode (CLI)

To use the Amazon CLI to set the pipeline execution mode, use the create-pipeline or update-pipeline command.

 Open a terminal session (Linux, OS X, or Unix) or command prompt (Windows) and run the get-pipeline command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, enter the following command:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Open the JSON file in any plain-text editor and modify the structure of the file to reflect the pipeline execution mode you want to set, such as QUEUED.

"executionMode": "QUEUED"

The following example shows how you would set the execution mode to QUEUED in an example pipeline with two stages.

```
{
    "pipeline": {
        "name": "MyPipeline",
        "roleArn": "arn:aws:iam::111122223333:role/service-role/
AWSCodePipelineServiceRole-us-east-1-dkpippe",
        "artifactStore": {
            "type": "S3",
            "location": "bucket"
        },
        "stages": [
```

```
{
    "name": "Source",
    "actions": [
        {
            "name": "Source",
            "actionTypeId": {
                "category": "Source",
                "owner": "AWS",
                "provider": "CodeCommit",
                "version": "1"
            },
            "runOrder": 1,
            "configuration": {
                "BranchName": "main",
                "OutputArtifactFormat": "CODE_ZIP",
                "PollForSourceChanges": "true",
                "RepositoryName": "MyDemoRepo"
            },
            "outputArtifacts": [
                {
                    "name": "SourceArtifact"
                }
            ],
            "inputArtifacts": [],
            "region": "us-east-1",
            "namespace": "SourceVariables"
        }
    ]
},
{
    "name": "Build",
    "actions": [
        {
            "name": "Build",
            "actionTypeId": {
                "category": "Build",
                "owner": "AWS",
                "provider": "CodeBuild",
                "version": "1"
            },
            "runOrder": 1,
            "configuration": {
                "ProjectName": "MyBuildProject"
            },
```

```
"outputArtifacts": [
                              {
                                  "name": "BuildArtifact"
                              }
                          ],
                          "inputArtifacts": [
                              {
                                  "name": "SourceArtifact"
                              }
                          ],
                          "region": "us-east-1",
                          "namespace": "BuildVariables"
                     }
                 ]
            }
        ],
        "version": 1,
        "executionMode": "QUEUED"
    }
}
```

3. If you are working with the pipeline structure retrieved using the get-pipeline command, you must modify the structure in the JSON file. You must remove the metadata lines from the file so the update-pipeline command can use it. Remove the section from the pipeline structure in the JSON file (the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields).

For example, remove the following lines from the structure:

```
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
    "created": "date",
    "updated": "date"
}
```

Save the file.

4. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

A Important

Be sure to include file:// before the file name. It is required in this command.

```
aws codepipeline update-pipeline --cli-input-json file://pipeline.json
```

This command returns the entire structure of the edited pipeline.

Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must start the pipeline manually to run that revision through the updated pipeline.

Roll back or retry stages

You can use the Amazon CodePipeline console or the Amazon CLI to manually roll back or retry a stage or actions in a stage. To configure conditions for stages where you want to use Rollback or Retry as the configured result, see Configure conditions for a stage.

Topics

- Configuring stage retry for a failed stage or failed actions
- Configuring stage rollback

Configuring stage retry for a failed stage or failed actions

You can retry a stage that has failed without having to run a pipeline again from the beginning. You do this by either retrying the failed actions in a stage or by retrying all actions in the stage starting from the first action in the stage. When you retry the failed actions in a stage, all actions that are still in progress continue working, and failed actions are triggered again. When you retry a failed stage from the first action in the stage, the stage cannot have any actions in progress. Before a stage can be retried, it must either have all actions failed or some actions failed and some succeeded.

🔥 Important

Retrying a failed stage retries all actions in the stage from the first action in the stage, and retrying failed actions retries all failed actions in the stage. This overrides output artifacts of previously successful actions in the same execution.

Although artifacts may be overriden, the execution history of previously successful actions is still retained.

If you are using the console to view a pipeline, either a **Retry stage** button or a **Retry failed actions** button appears on the stage that can be retried.

If you are using the Amazon CLI, you can use the **get-pipeline-state** command to determine whether any actions have failed.

🚯 Note

In the following cases, you might not be able to retry a stage:

- All actions in the stage succeeded, and so the stage is not in a failed status.
- The overall pipeline structure changed after the stage failed.
- Another retry attempt in the stage is already in progress.

Topics

- <u>Considerations for stage retry</u>
- Retry a failed stage manually
- Configure a stage for automatic retry on failure

Considerations for stage retry

Considerations for stage retry are as follows:

- You can only configure automatic retry on stage failure for one retry attempt.
- You can configure automatic retry on stage failure for all actions, including Source actions.

Retry a failed stage manually

You can manually retry a failed stage using the console or CLI.

You can also configure a stage for retry automatically on failure as detailed in <u>Configure a stage for</u> automatic retry on failure.

Retry a failed stage manually (console)

To retry a failed stage or failed actions in a stage - console

 Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names of all pipelines associated with your Amazon account are displayed.

2. In **Name**, choose the name of the pipeline.

- 3. Locate the stage with the failed action, and then choose one of the following:
 - To retry all actions in the stage, choose **Retry stage**.
 - To retry only failed actions in the stage, choose **Retry failed actions**.

Retry stage Retry failed actions	
build	(i)
AWS CodeBuild	0
Succeeded - 12 minutes ago	
Details	
View in AWS CodeBuild	
\checkmark	
Deploy	١
AWS CodeDeploy	
🛞 Failed - Just now	
Details	
View in AWS CodeDeploy	

If all retried actions in the stage are completed successfully, the pipeline continues to run.

Retry a failed stage manually (CLI)

To retry a failed stage or failed actions in a stage - CLI

To use the Amazon CLI to retry all actions or all failed actions, you run the **retry-stage-execution** command with the following parameters:

```
--pipeline-name <value>
--stage-name <value>
--pipeline-execution-id <value>
--retry-mode ALL_ACTIONS/FAILED_ACTIONS
```

🚯 Note

The values you can use for retry-mode are FAILED_ACTIONS and ALL_ACTIONS.

1. At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the <u>retry-stage-</u> execution command, as shown in the following example for a pipeline named MyPipeline.

```
aws codepipeline retry-stage-execution --pipeline-name MyPipeline --stage-name
Deploy --pipeline-execution-id b59babff-5f34-EXAMPLE --retry-mode FAILED_ACTIONS
```

The output returns the execution ID:

```
{
    "pipelineExecutionId": "b59babff-5f34-EXAMPLE"
}
```

- 2. You can also run the command with a JSON input file. You first create a JSON file that identifies the pipeline, the stage that contains the failed actions, and the latest pipeline execution in that stage. You then run the retry-stage-execution command with the --cli-input-json parameter. To retrieve the details you need for the JSON file, it's easiest to use the get-pipeline-state command.
 - At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the <u>get-pipeline-</u> <u>state</u> command on a pipeline. For example, for a pipeline named MyFirstPipeline, you would type something similar to the following:

aws codepipeline get-pipeline-state --name MyFirstPipeline

The response to the command includes pipeline state information for each stage. In the following example, the response indicates that one or more actions failed in the Staging stage:

```
{
    "updated": 1427245911.525,
    "created": 1427245911.525,
    "pipelineVersion": 1,
    "pipelineName": "MyFirstPipeline",
    "stageStates": [
        {
            "actionStates": [...],
            "stageName": "Source",
            "latestExecution": {
                "pipelineExecutionId": "9811f7cb-7cf7-SUCCESS",
                "status": "Succeeded"
            }
        },
        {
            "actionStates": [...],
            "stageName": "Staging",
            "latestExecution": {
                "pipelineExecutionId": "3137f7cb-7cf7-EXAMPLE",
                "status": "Failed"
            }
        }
    ]
}
```

- b. In a plain-text editor, create a file where you will record the following, in JSON format:
 - The name of the pipeline that contains the failed actions
 - The name of the stage that contains the failed actions
 - The ID of the latest pipeline execution in the stage
 - The retry mode.

For the preceding MyFirstPipeline example, your file would look something like this:

```
{
    "pipelineName": "MyFirstPipeline",
    "stageName": "Staging",
    "pipelineExecutionId": "3137f7cb-7cf7-EXAMPLE",
    "retryMode": "FAILED_ACTIONS"
}
```

- c. Save the file with a name like **retry-failed-actions.json**.
- d. Call the file you created when you run the **retry-stage-execution** command. For example:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

```
aws codepipeline retry-stage-execution --cli-input-json file://retry-failed-actions.json
```

e. To view the results of the retry attempt, either open the CodePipeline console and choose the pipeline that contains the actions that failed, or use the **get-pipeline-state** command again. For more information, see View pipelines and details in CodePipeline.

Configure a stage for automatic retry on failure

You can configure a stage for automatic retry on failure. The stage will make one retry attempt and display a retry status on the failed stage on the **View** pipeline page.

You can configure the retry mode by specifying that the stage should automatically retry either all actions in the failed stage or only failed actions in the stage.

Configure a stage for automatic retry on failure (console)

You can use the console to configure a stage for automatic retry.

Configure a stage for automatic retry (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In Name, choose the name of the pipeline you want to edit.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- 5. Choose **Automated stage configuration:**, and then choose **Enable automatic retry on stage failure**. Save the changes to your pipeline.
- 6. In **Automated stage configuration:**, choose one of the following retry modes:
 - To specify that the mode will retry all actions in the stage, choose **Retry failed stage**.
 - To specify that the mode will only retry failed actions in the stage, choose **Retry failed actions**.

Save the changes to your pipeline.

Add entry condition 🔻	Add success condition 🔻	Add failure condi	tion	
+ Add action group				
Build	0			
AWS CodeBuild	+	- Add action		
	Enable automatic roll	oack on stage failure		
	Enable automatic retr	y on stage failure 🗸		
+ Add action group	None			
Automated stage configuration	n: Enable automatic retr	v on stage failure 🔺	Retry mode:	Retry failed stage

 After your pipeline runs, if the stage failure occurs, the automatic retry attempt will be made. The following examples show a build stage that has been retried automatically.

Source <u>GitHub (Version 2)</u>			
Succeeded - <u>1 minu</u>	ite ago		
<u>d4002ba3</u>			
View details			
d4002ba3 🗹 Source: Maki	ing an update to Update	README.md	
Disable trans	ition		
····· • • ···· · · · · · · · · · · · ·			
⊗ Build Failed	Auto retry attempt Vie	w retry metadata	
🙁 Build Failed 🛃	Retry stage	w retry metadata Retry failed action:	5
	Retry stage	-	5
Start rollback	Retry stage	-	s
Start rollback	Retry stage	-	s
Start rollback Pipeline execution ID:	Retry stage	-	s
Start rollback Pipeline execution ID: Build	Retry stage	-	5
Start rollback Pipeline execution ID: Build <u>AWS CodeBuild</u>	Retry stage	-	s

8. To view details about the retry attempt, choose . The window displays.

Retry stage metada	ita	×
Pipeline Execution Id	ee4b9da8-62b4-	
Latest Retry Trigger	AutomatedStageRetry	
Auto Retry Attempt	1	
		Done

Configure a stage for automatic retry (CLI)

To use the Amazon CLI to configure a stage to automatically retry on failure, use the commands to create or update a pipeline as detailed in <u>Create a pipeline</u>, stages, and actions and <u>Edit a pipeline</u> in <u>CodePipeline</u>.

Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the update-pipeline command, specifying the failure condition in the pipeline structure. The following example configures automatic retry for a staged named S3Deploy:

```
{
                "name": "S3Deploy",
                "actions": [
                    {
                         "name": "s3deployaction",
                         "actionTypeId": {
                             "category": "Deploy",
                             "owner": "AWS",
                             "provider": "S3",
                             "version": "1"
                         },
                         "runOrder": 1,
                         "configuration": {
                             "BucketName": "static-website-bucket",
                             "Extract": "false",
                             "ObjectKey": "SampleApp.zip"
                         },
                         "outputArtifacts": [],
                         "inputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
                         ],
                         "region": "us-east-1"
                    }
                ],
                 "onFailure": {
                     "result": "RETRY",
                     "retryConfiguration": {
                         "retryMode": "ALL_ACTIONS",
                    },
            }
```

Configure a stage for automatic retry (Amazon CloudFormation)

To use Amazon CloudFormation to configure a stage for automatic retry on failure, use the OnFailure stage lifecycle parameter. Use the RetryConfiguration parameter to configure the retry mode.

```
OnFailure:
Result: RETRY
RetryConfiguration:
RetryMode: ALL_ACTIONS
```

 Update the template as shown in the following snippet. The following example configures automatic retry for a stage named Release:

```
AppPipeline:
 Type: AWS::CodePipeline::Pipeline
  Properties:
    RoleArn:
      Ref: CodePipelineServiceRole
    Stages:
        Name: Source
        Actions:
            Name: SourceAction
            ActionTypeId:
              Category: Source
              Owner: AWS
              Version: 1
              Provider: S3
            OutputArtifacts:
                Name: SourceOutput
            Configuration:
              S3Bucket:
                Ref: SourceS3Bucket
              S3ObjectKey:
                Ref: SourceS30bjectKey
            RunOrder: 1
        Name: Release
        Actions:
```

```
Name: ReleaseAction
        InputArtifacts:
            Name: SourceOutput
        ActionTypeId:
          Category: Deploy
          Owner: AWS
          Version: 1
          Provider: CodeDeploy
        Configuration:
          ApplicationName:
            Ref: ApplicationName
          DeploymentGroupName:
            Ref: DeploymentGroupName
        RunOrder: 1
   OnFailure:
       Result: RETRY
       RetryConfiguration:
          RetryMode: ALL_ACTIONS
ArtifactStore:
  Type: S3
  Location:
    Ref: ArtifactStoreS3Location
  EncryptionKey:
    Id: arn:aws:kms:useast-1:ACCOUNT-ID:key/KEY-ID
    Type: KMS
DisableInboundStageTransitions:
    StageName: Release
    Reason: "Disabling the transition until integration tests are completed"
Tags:
  - Key: Project
    Value: ProjectA
  - Key: IsContainerBased
    Value: 'true'
```

For more information about configuring stage retry on failure, see <u>OnFailure</u> under StageDeclaration in the *Amazon CloudFormation User Guide*.

Configuring stage rollback

You can roll back a stage to an execution that was successful in that stage. You can preconfigure a stage for rollback on failure, or you can manually roll back a stage. The rolled back operation will result in a new execution. The target pipeline execution chosen for rollback is used to retrieve source revisions and variables.

The type of execution, either standard or rollback, displays in the pipeline history, pipeline state, and pipeline execution details.

Topics

- <u>Considerations for rollbacks</u>
- Roll back a stage manually
- Configure a stage for automatic rollback
- View rollback status in execution listing
- <u>View rollback status details</u>

Considerations for rollbacks

Considerations for stage rollback are as follows:

- You cannot roll back a source stage.
- The pipeline can only roll back to a previous execution if the previous execution was started in the current pipeline structure version.
- You cannot roll back to a target execution ID that is a rollback execution type.
- CodePipeline will use the variables and artifacts from the execution to which it is rolling back.

Roll back a stage manually

You can manually roll back a stage using the console or CLI. The pipeline can only roll back to a previous execution if the previous execution was started in the current pipeline structure version.

You can also configure a stage to roll back automatically on failure as detailed in <u>Configure a stage</u> for automatic rollback.

Roll back a stage manually (console)

You can use the console to manually roll back a stage to a target pipeline execution. When a stage is rolled back, a **Rollback** label displays on the pipeline visualization in the console.

Roll back a stage manually (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon account are displayed.

2. In Name, choose the name of the pipeline with the stage to roll back.

Source		
AWS CodeCommit		
Succeeded - Just now		
<u>10cb9a83</u>		
View details		
Ocb9a83 Source: update		
Disable transition		
/		
deploys3 Succeeded	Start rollback	<u>د</u>
ipeline execution ID: <u>d1b8bf31-1d2f-4133-98f8-6a104fee1b4f</u>		
s3deploy		
Amazon S3		
Succeeded - Just now		

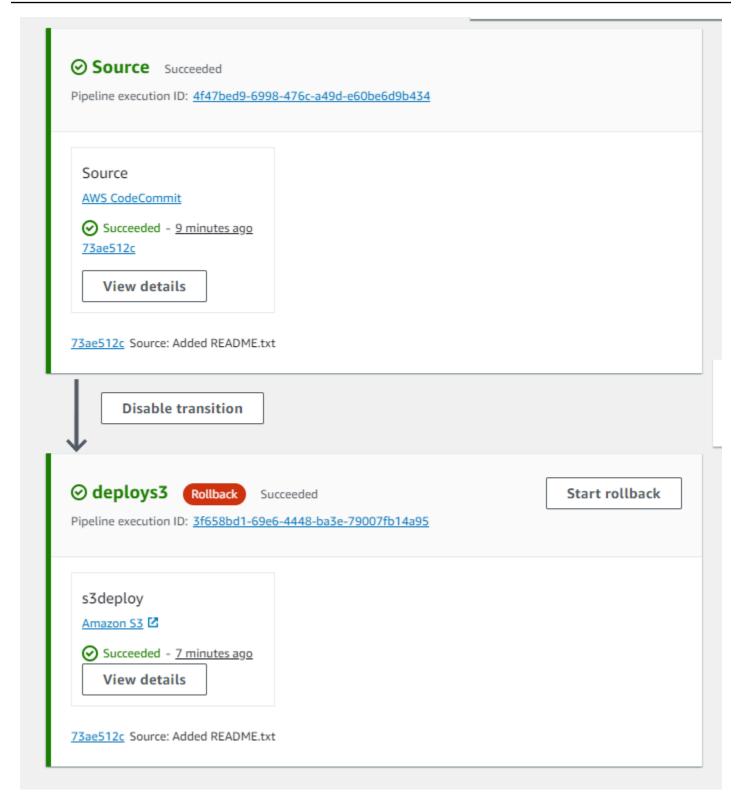
- 3. On the stage, choose **Start rollback**. The **Roll back to** page displays.
- 4. Choose the target execution to which you want to roll back the stage.

(i) Note

The list of target pipeline executions available will be all executions in the current pipeline version beginning on February 1, 2024.

	back to				Start rollback
Q	Execution ID	Source revisions	Started	Duration	< 1 > @
0	07c0ff1d	Source – <u>04b7e235</u> : Edited README.txt	4 days ago	5 seconds	4 days ago
Э	f15b38f7	Source – <u>f823f4a3</u> : Edited README.txt	5 days ago	5 seconds	5 days ago
0	4f47bed9	Source – <u>73ae512c</u> : Added README.txt	8 days ago	5 seconds	8 days ago
0	fcd61d8b	Source – <u>73ae512c</u> : Added README.txt	8 days ago	7 seconds	8 days ago

The following diagram shows an example of the rolled back stage with the new execution ID.



Roll back a stage manually (CLI)

To use the Amazon CLI to manually roll back a stage, use the rollback-stage command.

You can also roll back a stage manually as detailed in Roll back a stage manually.

🚯 Note

The list of target pipeline executions available will be all executions in the current pipeline version beginning on February 1, 2024.

To roll back a stage manually (CLI)

1. The CLI command for manual rollback will require the execution ID of a previously successful pipeline execution in the stage. To get the target pipeline execution ID that you will specify, use the list-pipeline-executions command with a filter that will return successful executions in the stage. Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the list-pipeline-executions command, specifying the name of the pipeline and the filter for successful executions in the stage. In this example, the output will list pipeline executions for the pipeline named MyFirstPipeline and for successful executions in the stage named deploys3.

aws codepipeline list-pipeline-executions --pipeline-name MyFirstPipeline --filter succeededInStage={stageName=deploys3}

In the output, copy the execution ID of the previously successful execution that you want to specify for rollback. You will use this in the next step as the target execution ID.

2. Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the rollback-stage command, specifying the name of the pipeline, the name of the stage, and the target execution that you want to roll back to. For example, to roll back a stage named Deploy for a pipeline named *MyFirstPipeline*:

aws codepipeline rollback-stage --pipeline-name MyFirstPipeline --stage-name Deploy
 --target-pipeline-execution-id bc022580-4193-491b-8923-9728dEXAMPLE

The output returns the execution ID for the new rolled-back execution. This is a separate ID that uses the source revisions and parameters of the specified target execution.

Configure a stage for automatic rollback

You can configure stages in a pipeline to roll back automatically on failure. When the stage fails, the stage is rolled back to the most recent successful execution. The pipeline can only roll back to a previous execution if the previous execution was started in the current pipeline structure version. Since, automatic rollback configuration is part of the pipeline definition, your pipeline stage will auto-rollback only after there is a successful pipeline execution in the pipeline stage.

Configure a stage for automatic rollback (console)

You can roll back a stage to a specified previous successful execution. For more information, see RollbackStage in the CodePipeline API Guide.

Configure a stage for automatic rollback (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names and status of all pipelines associated with your Amazon account are displayed.

- 2. In Name, choose the name of the pipeline you want to edit.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- 5. Choose **Automated stage configuration:**, and then choose **Configure automatic rollback on stage failure**. Save the changes to your pipeline.

١	+ Add action		
∠ ×			
		+ Add action	+ Add action

•

Configure a stage for automatic rollback (CLI)

To use the Amazon CLI to configure a failed stage to automatically roll back to the most recent successful execution, use the commands to create or update a pipeline as detailed in <u>Create a</u> pipeline, stages, and actions and Edit a pipeline in CodePipeline.

Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the update-pipeline command, specifying the failure condition in the pipeline structure. The following example configures automatic rollback for a staged named S3Deploy:

```
{
                "name": "S3Deploy",
                "actions": [
                     {
                         "name": "s3deployaction",
                         "actionTypeId": {
                             "category": "Deploy",
                             "owner": "AWS",
                             "provider": "S3",
                             "version": "1"
                         },
                         "runOrder": 1,
                         "configuration": {
                             "BucketName": "static-website-bucket",
                             "Extract": "false",
                             "ObjectKey": "SampleApp.zip"
                         },
                         "outputArtifacts": [],
                         "inputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
                         ],
                         "region": "us-east-1"
                     }
                ],
                "onFailure": {
                     "result": "ROLLBACK"
                }
            }
```

For more information about configuring failure conditions for stage rollback, see FailureConditions in the *CodePipeline API Reference*.

Configure a stage for automatic rollback (Amazon CloudFormation)

To use Amazon CloudFormation to configure a stage to roll back automatically on failure, use the OnFailure parameter. On failure, the stage will automatically roll back to the most recent successful execution.

```
OnFailure:
Result: ROLLBACK
```

• Update the template as shown in the following snippet. The following example configures automatic rollback for a staged named Release:

```
AppPipeline:
 Type: AWS::CodePipeline::Pipeline
  Properties:
    RoleArn:
      Ref: CodePipelineServiceRole
    Stages:
        Name: Source
        Actions:
            Name: SourceAction
            ActionTypeId:
              Category: Source
              Owner: AWS
              Version: 1
              Provider: S3
            OutputArtifacts:
                Name: SourceOutput
            Configuration:
              S3Bucket:
                Ref: SourceS3Bucket
              S3ObjectKey:
                Ref: SourceS30bjectKey
            RunOrder: 1
```

```
Name: Release
    Actions:
        Name: ReleaseAction
        InputArtifacts:
            Name: SourceOutput
        ActionTypeId:
          Category: Deploy
          Owner: AWS
          Version: 1
          Provider: CodeDeploy
        Configuration:
          ApplicationName:
            Ref: ApplicationName
          DeploymentGroupName:
            Ref: DeploymentGroupName
        RunOrder: 1
   OnFailure:
        Result: ROLLBACK
ArtifactStore:
  Type: S3
  Location:
    Ref: ArtifactStoreS3Location
  EncryptionKey:
    Id: arn:aws:kms:useast-1:ACCOUNT-ID:key/KEY-ID
    Type: KMS
DisableInboundStageTransitions:
    StageName: Release
    Reason: "Disabling the transition until integration tests are completed"
Tags:
  - Key: Project
    Value: ProjectA
  - Key: IsContainerBased
    Value: 'true'
```

For more information about configuring failure conditions for stage rollback, see <u>OnFailure</u> under StageDeclaration in the *Amazon CloudFormation User Guide*.

View rollback status in execution listing

You can view the status and target execution ID for a rollback execution.

View rollback status in list of executions (console)

You can use the console to view the status and target execution ID for a rollback execution in the execution listing.

View rollback execution status in list of executions (console)

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 2. In **Name**, choose the name of the pipeline you want to view.
- 3. Choose **History**. The list of executions shows the label **Rollback**.

aws codepipeline list-pipeline-executions --pipeline-name MyFirstPipeline

This command returns a list of all of the completed executions associated with the pipeline.

Exec	ution history	Info		Rerun Sto	p execution	View details	Release change
Q	Ī						< 1 > ©
	Execution ID	Status	Source revisions	Trigger	Started	Duration	Completed
)	5cd064ca Rollback	🛞 Failed	Source – 04b7e235: Edited README.txt	Automated Rollback FailedPipeli neExecution Id - b2e77fa5	Apr 24, 2024 12:19 PM (UTC-7:00)	1 second	Apr 24, 2024 12:19 PM (UTC-7:00)
)	b2e77fa5	🙁 Failed	Source – <u>10cb9a83</u> : update	StartPipelin eExecution	Apr 24, 2024 12:19 PM (UTC-7:00)	5 seconds	Apr 24, 2024 12:19 PM (UTC-7:00)
)	5efcfa68 Rollback	⊘ Succeeded	Source – 04b7e235: Edited README.txt	ManualRoll back -	Apr 24, 2024 12:16 PM (UTC-7:00)	2 seconds	Apr 24, 2024 12:16 PM (UTC-7:00)
)	d1b8bf31	⊘ Succeeded	Source – 10cb9a83: update	StartPipelin eExecution	Apr 24, 2024 12:14 PM (UTC-7:00)	6 seconds	Apr 24, 2024 12:14 PM (UTC-7:00)

Choose the execution ID for which you want to view details.

View rollback status with list-pipeline-executions (CLI)

You can use the CLI to view the status and target execution ID for a rollback execution.

• Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the **list-pipeline-executions** command:

API Version 2015-07-09 712

The following example shows the returned data for a pipeline named *MyFirstPipeline* where a rollback execution started the pipeline.

```
{
    "pipelineExecutionSummaries": [
        {
            "pipelineExecutionId": "eb7ebd36-353a-4551-90dc-18ca5EXAMPLE",
            "status": "Succeeded",
            "startTime": "2024-04-16T09:00:28.185000+00:00",
            "lastUpdateTime": "2024-04-16T09:00:29.665000+00:00",
            "sourceRevisions": [
                {
                    "actionName": "Source",
                    "revisionId": "revision_ID",
                    "revisionSummary": "Added README.txt",
                    "revisionUrl": "console-URL"
                }
            ],
            "trigger": {
                "triggerType": "ManualRollback",
                "triggerDetail": "{arn:aws:sts::<account_ID>:assumed-role/<role>"}"
            },
            "executionMode": "SUPERSEDED",
            "executionType": "ROLLBACK",
            "rollbackMetadata": {
                "rollbackTargetPipelineExecutionId":
 "f15b38f7-20bf-4c9e-94ed-2535eEXAMPLE"
            }
        },
        {
            "pipelineExecutionId": "fcd61d8b-4532-4384-9da1-2aca1EXAMPLE",
            "status": "Succeeded",
            "startTime": "2024-04-16T08:58:56.601000+00:00",
            "lastUpdateTime": "2024-04-16T08:59:04.274000+00:00",
            "sourceRevisions": [
                {
                    "actionName": "Source",
                    "revisionId": "revision_ID",
                    "revisionSummary": "Added README.txt",
                    "revisionUrl": "console_URL"
                }
            ],
```

```
"trigger": {
                "triggerType": "StartPipelineExecution",
                "triggerDetail": "arn:aws:sts::<account_ID>:assumed-role/<role>"
            },
            "executionMode": "SUPERSEDED"
       },
        {
            "pipelineExecutionId": "5cd064ca-bff7-425f-8653-f41d9EXAMPLE",
            "status": "Failed",
            "startTime": "2024-04-24T19:19:50.781000+00:00",
            "lastUpdateTime": "2024-04-24T19:19:52.119000+00:00",
            "sourceRevisions": [
                {
                    "actionName": "Source",
                    "revisionId": "<revision_ID>",
                    "revisionSummary": "Edited README.txt",
                    "revisionUrl": "<revision_URL>"
                }
            ],
            "trigger": {
                "triggerType": "AutomatedRollback",
                "triggerDetail": "{\"FailedPipelineExecutionId\":
\"b2e77fa5-9285-4dea-ae66-4389EXAMPLE\"}"
            },
            "executionMode": "SUPERSEDED",
            "executionType": "ROLLBACK",
            "rollbackMetadata": {
                "rollbackTargetPipelineExecutionId": "5efcfa68-d838-4ca7-
a63b-4a743EXAMPLE"
            }
         },
```

View rollback status details

You can view the status and target execution ID for a rollback execution.

View rollback status on detail page (console)

You can use the console to view the status and target pipeline execution ID for a rollback execution.

Developer Tools > CodePipelin	e > Pipelines > rbtest > Exe	cution history > 01ccf		
Pipeline executio	on: 01cc	Rerun Stop execution	Previous execution	Next execution >
Execution summary				
Status Succeeded 	Started 1 hour ago	Completed 1 hour ago	Duration 1 second	
Trigger ManualRollback -	C			
Latest action execution messa Deployment Succeeded	ge			
Pipeline execution ID D 01ccf652-ab11-4d4b-898	c-9473ef8521ba			
Execution type ROLLBACK				
Target pipeline execution ID	I-2535ee02			C
Visualization Timeline	Variables Revisions			
Source Didn't Run				
Source 3 AWS CodeCommit)			
O Didn't Run				
No executions yet				
⊘ deploys3 Succeeded				Start rollback

View rollback details with get-pipeline-execution (CLI)

Pipeline executions that have been rolled back will show in the output for getting the pipeline execution.

To view details about a pipeline, run the **<u>get-pipeline-execution</u>** command, specifying the unique name of the pipeline. For example, to view details about a pipeline named *MyFirstPipeline*, enter the following:

```
aws codepipeline get-pipeline-execution --pipeline-name MyFirstPipeline --pipeline-
execution-id 3f658bd1-69e6-4448-ba3e-79007EXAMPLE
```

This command returns the structure of the pipeline.

The following example shows the returned data for a portion of a pipeline named *MyFirstPipeline*, where the rollback execution ID and metadata are shown.

```
{
    "pipelineExecution": {
        "pipelineName": "MyFirstPipeline",
        "pipelineVersion": 6,
        "pipelineExecutionId": "2004a94e-8b46-4c34-a695-c8d20EXAMPLE",
        "status": "Succeeded",
        "artifactRevisions": [
            {
                "name": "SourceArtifact",
                "revisionId": "<ID>",
                "revisionSummary": "Added README.txt",
                "revisionUrl": "<console_URL>"
            }
        ],
        "trigger": {
            "triggerType": "ManualRollback",
            "triggerDetail": "arn:aws:sts::<account_ID>:assumed-role/<role>"
        },
        "executionMode": "SUPERSEDED",
        "executionType": "ROLLBACK",
        "rollbackMetadata": {
            "rollbackTargetPipelineExecutionId": "4f47bed9-6998-476c-a49d-
e60beEXAMPLE"
        }
    }
}
```

View rollback state with get-pipeline-state (CLI)

Pipeline executions that have been rolled back will show in the output for getting the pipeline state.

To view details about a pipeline, run the **get-pipeline-state** command, specifying the unique name of the pipeline. For example, to view state details about a pipeline named *MyFirstPipeline*, enter the following:

aws codepipeline get-pipeline-state --name MyFirstPipeline

The following example shows the returned data with the rollback execution type.

```
{
    "pipelineName": "MyFirstPipeline",
    "pipelineVersion": 7,
    "stageStates": [
        {
            "stageName": "Source",
            "inboundExecutions": [],
            "inboundTransitionState": {
                "enabled": true
            },
            "actionStates": [
                {
                    "actionName": "Source",
                    "currentRevision": {
                         "revisionId": "<Revision_ID>"
                    },
                    "latestExecution": {
                         "actionExecutionId": "13bbd05d-
b439-4e35-9c7e-887cb789b126",
                         "status": "Succeeded",
                         "summary": "update",
                         "lastStatusChange": "2024-04-24T20:13:45.799000+00:00",
                         "externalExecutionId": "10cbEXAMPLEID"
                    },
                    "entityUrl": "console-url",
                    "revisionUrl": "console-url"
                }
            ],
            "latestExecution": {
```

User Guide

```
"pipelineExecutionId": "cf95a8ca-0819-4279-ae31-03978EXAMPLE",
                "status": "Succeeded"
            }
        },
        {
            "stageName": "deploys3",
            "inboundExecutions": [],
            "inboundTransitionState": {
                "enabled": true
            },
            "actionStates": [
                {
                    "actionName": "s3deploy",
                    "latestExecution": {
                        "actionExecutionId":
 "3bc4e3eb-75eb-45b9-8574-8599aEXAMPLE",
                        "status": "Succeeded",
                        "summary": "Deployment Succeeded",
                        "lastStatusChange": "2024-04-24T20:14:07.577000+00:00",
                        "externalExecutionId": "mybucket/SampleApp.zip"
                    },
                    "entityUrl": "console-URL"
                }
            ],
            "latestExecution": {
                "pipelineExecutionId": "fdf6b2ae-1472-4b00-9a83-1624eEXAMPLE",
                "status": "Succeeded",
                "type": "ROLLBACK"
            }
        }
    ],
    "created": "2024-04-15T21:29:01.635000+00:00",
    "updated": "2024-04-24T20:12:24.480000+00:00"
}
```

Configure conditions for a stage

You can specify a condition for a stage, such as checking for a specific variable in the pipeline run, and then engage a result for the condition, such as skipping the stage or failing the stage. A pipeline can be set up to check for stage conditions during the run, where you specify checks for a stage and then specify how the stage should continue when certain conditions are met. Conditions contain one or more rules that are available in a list of rules in CodePipeline. If all rules in a condition succeed, then the condition is met. You can configure conditions so that when the criteria are not met, the specified result engages.

Each condition has a rule set which is an ordered set of rules that are evaluated together. Therefore, if one rule fails in the condition, then the condition fails. You can override rule conditions at pipeline runtime.

Conditions are used for specific types of expressions and each has specific options for results available as follows:

- Entry The conditions for making checks that, if met, allow entry to a stage. Rules are engaged with the following result options: Fail or Skip
- **On Failure** The conditions for making checks for the stage when it fails. Rules are engaged with the following result option: **Rollback**
- **On Success** The conditions for making checks for the stage when it succeeds. Rules are engaged with the following result options: **Rollback** or **Fail**

Conditions are supported by a set of *rules* for each type of condition.

For each type of condition, there are specific actions that are set up by the condition. The action is the result of the succeeded or failed condition check. For example, the condition for entry (entry condition) encounters an alarm (rule), then the check is successful and the result (action) is that the stage entry is blocked.

You can also use the Amazon CodePipeline console or the Amazon CLI to manually roll back or retry a stage or actions in a stage. See <u>Configure conditions for a stage</u>.

Topics

- Use cases for stage conditions
- Considerations for results configured for stage conditions

- Considerations for rules configured for stage conditions
- Creating Entry conditions
- Creating On Failure conditions
- Creating On Success conditions
- Deleting stage conditions
- Overriding stage conditions

Use cases for stage conditions

Stage conditions have multiple use cases for setting up release and change safety in pipelines. The following are sample use cases for stage conditions.

- Use an Entry condition to define a condition that will check the CloudWatch alarm state, which will then block a change if the production environment is not in a healthy state.
- Use an Entry condition with a wait time of 60 to define a condition to be evaluated when all the actions in a stage have successfully completed, and then roll back the changes if a CloudWatch alarm goes into ALARM state within 60 minutes.
- Use an On Success condition to define a condition so that when the stage completes successfully, the rule will check whether the current time is in the deployment window and then deploy if the rule succeeds.

Considerations for results configured for stage conditions

Considerations for stage conditions are as follows:

- You cannot use automatic stage retry with onFailure conditions.
- When configuring a condition with a **Rollback** result, the stage can only roll back to a previous execution if available in the current pipeline structure version.
- When configuring a condition with a **Rollback** result, you cannot roll back to a target execution ID that is a rollback execution type.
- For Entry conditions that use the **Skip** result to skip the stage if the condition fails, only the LambdaInvoke and VariableCheck rules are supported.
- You cannot perform a manual stage retry on a stage in **Skipped** status.
- You cannot perform a manual rollback to a stage in **Skipped** status.

- You cannot override a condition if the condition is configured with a **Skip** result.
- With the exception of **Skip** results, you can override a stage condition when starting a pipeline execution. For a stage condition where an override is engaged, the execution will perform as detailed in the following table.

Туре	Configured result on condition failure	Stage status	Override behavior
Entry	Fail	In-progress	The stage proceeds.
Entry	Skip	Skipped	Not applicable.
OnFailure	Rollback	Failed	The stage is failed.
OnSuccess	Rollback	Succeeded	The stage proceeds.
OnSuccess	Fail	Failed	The stage proceeds.

Considerations for rules configured for stage conditions

Considerations for the available rules for stage conditions are as follows:

- For the LambdaInvoke rule, you must first configure the Lambda function to be used in the rule. Have the Lambda function ARN ready to provide when you configure the rule.
- For the CloudWatchAlarm rule, you must first configure the CloudWatch Events event to be used in the rule. Have the event ARN ready to provide when you configure the rule.

Creating Entry conditions

You can configure Entry conditions for a stage using the console or CLI. You will configure the corresponding rules and results for each condition. For a rollback result, the pipeline can only roll back to a previous execution if the previous execution was started in the current pipeline structure version.

The steps provide an example Entry condition that uses a monitor rule.

For more information, see <u>Condition</u>, <u>RuleTypeId</u>, and <u>RuleExecution</u> in the *CodePipeline API Guide*.

Creating Entry conditions - CloudWatchAlarm rule example (Console)

You can configure Entry conditions for a stage, along with the rules and results you want the stage to perform when the conditions are met.

Configure an Entry condition (console)

- 1. Complete any prerequisites, such as creating the resource and ARN for a rule where a resource is provided, such as the **Amazon CloudWatchAlarm**.
- Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 3. In Name, choose the name of the pipeline you want to edit.
- 4. On the pipeline details page, choose **Edit**.
- 5. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- 6. Choose **Add entry condition**. The **Before stage entry condition** card displays with the **Fail** option available for this condition.
- 7. Choose **Add rule**, and then complete the following.
 - a. In **Rule name**, enter a name for your rule. For this example, enter MyAlarmRule.
 - b. In **Rule provider**, choose the preconfigured rule provider to add to your condition. For this example, choose **Amazon CloudWatchAlarm**, and then complete the following steps.
 - c. In **Region**, choose the Region for your condition or leave the default.
 - d. In **Alarm name**, choose the CloudWatch resource to use for the rule. You must have already created the resource in your account.
 - e. (Optional) In **Wait time**, enter the amount of time CodePipeline will wait if the alarm is in ALARM state when it is first evaluated. If the alarm is OK state when the rule is first checked, the rule will immediately succeed.
 - f. (Optional) Enter any specific alarm states to monitor, and enter the role ARN if appropriate.
 - g. When you are done editing the stage, choose **Done**. On the pipeline edit page, choose **Save**.
- 8. After the run, view the result.

Creating Entry conditions with Skip result and VariableCheck rule (console)

You can configure Entry conditions for a stage so that if the entry condition is not met, the stage is skipped If the condition fails, then the result engages and the stage is skipped. When a stage is skipped, the stage status is **Skipped**, and the action status is **Didn't Run**. For considerations for stage conditions with Skip results, see Considerations for results configured for stage conditions.

In the following example, the variable check rule finds that the value is not a match, and the build stage is skipped.

Configure an Entry condition with a Skip result (console)

- 1. Complete any prerequisites, such as creating the resource and ARN for a rule where a resource is provided, such as the **Amazon CloudWatchAlarm**.
- 2. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 3. In **Name**, choose the name of the pipeline you want to edit.
- 4. On the pipeline details page, choose **Edit**.
- 5. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- 6. Choose **Add entry condition**, and then choose **Skip** as the result.
- 7. Choose **Add rule**, and then complete the following.
 - a. In **Rule name**, enter a name for your rule. For this example, enter MyAlarmRule.
 - b. In **Rule provider**, choose the preconfigured rule provider to add to your condition. For this example, choose **VariableCheck**, and then complete the following steps.

Add entry condition 🔻	Add	success condition v	Add failure conditio
Before stage entry	conditi	on	Delete conditio
Result: Skip MyEntrySkipRule AWS VariableCheck	(j)	+ Add rule	
Ø	×	+ Add rule	

- c. In **Region**, choose the Region for your condition or leave the default.
- In Variable, choose the variable to compare with, such as #{SourceVariables.FullRepositoryName} for a pipeline that has a GitHub (via GitHub App) source action. Enter the repository name and choose the operator, such as Equals.
- e. When you are done editing the stage, choose **Done**. On the pipeline edit page, choose **Save**.
- 8. After the run, view the result.

N//

Entry condition:						
Deploy Skipped Pipeline execution ID: 1.	a4b8096-35a1					
Deploy Amazon S3 2 Didn't Run No executions yet	Ū					

To review details, choose **Review**. The detail in the following example shows that the configured result for the condition is **Skip**, which cannot be overridden. The rule status is **Failed** due to the condition not being met.

Condition execution details	×
Execution ID: 08275562-de97-456e-	
Condition type: BeforeEntry Result: SKIP Status: (8) Failed	

Name	Rule Execution ID	Status	Reason	
myruleforskip	2d28d804-20d3-4357-8ebe-	Failed	Job failed. Job ID d51899c9-44f4-499c-	
	۷	Falleu	a12 .	

Creating Entry conditions (CLI)

To use the Amazon CLI to configure an Entry condition, use the commands to create or update a pipeline as detailed in Create a pipeline, stages, and actions and Edit a pipeline in CodePipeline.

Configure the condition and rule or rules (CLI)

Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the update-pipeline command, specifying the failure condition in the pipeline structure. The following example configures an Entry condition for a staged named Deploy:

```
{
    "name": "Deploy",
    "actions": [
        {
            "name": "Deploy",
            "actionTypeId": {
                "category": "Deploy",
                "owner": "AWS",
                "provider": "S3",
                "version": "1"
            },
            "runOrder": 1,
            "configuration": {
                "BucketName": "MyBucket",
                "Extract": "false",
                "ObjectKey": "object.xml"
            },
```

```
"outputArtifacts": [],
            "inputArtifacts": [
                {
                     "name": "SourceArtifact"
                }
            ],
            "region": "us-east-1",
            "namespace": "DeployVariables"
        }
    ],
    "beforeEntry": {
        "conditions": [
            {
                "result": "FAIL",
                "rules": [
                    {
                         "name": "MyAlarmRule",
                         "ruleTypeId": {
                             "category": "Rule",
                             "owner": "AWS",
                             "provider": "CloudWatchAlarm",
                             "version": "1"
                         },
                         "configuration": {
                             "AlarmName": "CWAlarm",
                             "WaitTime": "1"
                         },
                         "inputArtifacts": [],
                         "region": "us-east-1"
                    }
                ]
           }
        ]
   }
}
```

For more information about configuring success conditions for stage rollback, see SuccessConditions in the *CodePipeline API Reference*.

Creating Entry conditions (CFN)

To use Amazon CloudFormation to configure an Entry condition, use the beforeEntry parameter. On entry, the stage will run the rule and perform the result.

beforeEntry:
 Result: FAIL

• Update the template as shown in the following snippet. The following example configures an Entry condition with a rule named MyMonitorRule:

```
Name: Deploy
Actions:
- Name: Deploy
 ActionTypeId:
    Category: Deploy
    Owner: AWS
    Provider: S3
    Version: '1'
  RunOrder: 1
  Configuration:
    BucketName: MyBucket
    Extract: 'false'
    ObjectKey: object.xml
  OutputArtifacts: []
  InputArtifacts:
  - Name: SourceArtifact
  Region: us-east-1
  Namespace: DeployVariables
BeforeEntry:
  Conditions:
  - Result: FAIL
    Rules:
    - Name: MyMonitorRule
      RuleTypeId:
        Category: Rule
        Owner: AWS
        Provider: CloudWatchAlarm
        Version: '1'
      Configuration:
        AlarmName: CWAlarm
        WaitTime: '1'
```

InputArtifacts: []
Region: us-east-1

For more information about configuring beforeEntry conditions, see <u>AWS::CodePipeline::Pipeline BeforeEntryConditions</u> under StageDeclaration in the Amazon CloudFormation User Guide.

Creating On Failure conditions

You can configure On Failure conditions for a stage using the console or CLI. You will configure the corresponding rules and results for each condition. For a rollback result, the pipeline can only roll back to a previous execution if the previous execution was started in the current pipeline structure version.

Creating On Failure conditions (Console)

You can configure On Failure conditions for a stage, along with the rules and results you want the stage to perform when the conditions are met.

Configure an On Failure condition (console)

- 1. Complete any prerequisites, such as creating the resource and ARN for a rule where a resource is provided, such as the **LambdaInvoke** rule.
- 2. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 3. In Name, choose the name of the pipeline you want to edit.
- 4. On the pipeline details page, choose **Edit**.
- 5. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- 6. Choose **Add failure condition**. The **Failure condition** card displays with the **Rollback** option available for this condition.
- 7. Choose **Add rule**, and then complete the following.
 - a. In **Rule name**, enter a name for your rule. For this example, enter MyLambdaRule.

- b. In **Rule provider**, choose the preconfigured rule provider to add to your condition. For this example, choose **Amazon LambdaInvoke**, and then complete the following steps.
- c. In **Region**, choose the Region for your condition or leave the default.
- d. In **Input artifacts**, choose the source artifact.
- e. In **Function name**, choose the Lambda resource to use for the rule. You must have already created the resource in your account.
- f. (Optional) In **User parameters**, enter any pairs that represent parameters for additional configuration.
- g. (Optional) In **Role Arn**, enter the role ARN if configured.
- h. (Optional) In **Timeout in Minutes**, enter the time in minutes that the rule should wait before timeout.
- i. When you are done editing the stage, choose **Done**. On the pipeline edit page, choose **Save**.

Creating onFailure conditions with a Retry result example (Console)

You can configure onFailure conditions for a stage so that if the entry condition is not met, the stage is retried. As part of this result, you configure the retry mode, specifying whether to retry the failed actions or to retry the failed stage.

Configure an onFailure condition with a Retry result (console)

- 1. Complete any prerequisites, such as creating the resource and ARN for a rule where a resource is provided, such as the **Amazon CloudWatchAlarm**.
- 2. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 3. In **Name**, choose the name of the pipeline you want to edit.
- 4. On the pipeline details page, choose **Edit**.
- 5. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- At the bottom of the stage, under Automated stage configuration:, choose Enable automatic retry on stage failure. In Retry mode, choose either Retry failed stage or Retry failed actions.

s3deploy	0		
Amazon 53 🖸		+ Add action	
Ø	×	Enable automatic rollbac	k on stage failure
		Enable automatic retry on stage failure	
+ Add action grou	up	None	1
utomated stage configuration:		None 🔺	

- 7. Choose to add an onFailure condition and then choose **Add rule** and enter a rule for the condition.
 - a. In **Rule name**, enter a name for your rule. For this example, enter MyAlarmRule.
 - b. In **Rule provider**, choose the preconfigured rule provider to add to your condition. For this example, choose **CloudWatchAlarm**, and then complete the following steps.
 - c. In **Region**, choose the Region for your condition or leave the default.
 - d. In Alarm Name, choose the configured resource for the alert.
 - e. When you are done editing the stage, choose **Done**. On the pipeline edit page, choose **Save**.
- 8. After the run, view the result.

Creating On Failure conditions (CLI)

To use the Amazon CLI to configure an On Failure condition, use the commands to create or update a pipeline as detailed in Create a pipeline, stages, and actions and Edit a pipeline in CodePipeline.

Configure the condition and rule or rules (CLI)

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the update-pipeline command, specifying the failure condition in the pipeline structure. The following example configures an On Failure condition for a staged named Deploy:

```
{
    "name": "Deploy",
    "actions": [
        {
            "name": "Deploy",
            "name": "Deploy",
```

Amazon CodePipeline

```
"actionTypeId": {
            "category": "Deploy",
            "owner": "AWS",
            "provider": "S3",
            "version": "1"
        },
        "runOrder": 1,
        "configuration": {
            "BucketName": "MyBucket",
            "Extract": "false",
            "ObjectKey": "object.xml"
        },
        "outputArtifacts": [],
        "inputArtifacts": [
            {
                "name": "SourceArtifact"
            }
        ],
        "region": "us-east-1",
        "namespace": "DeployVariables"
   }
],
"onFailure": {
    "conditions": [
        ſ
            "result": "ROLLBACK",
            "rules": [
                {
                     "name": "MyLambdaRule",
                    "ruleTypeId": {
                         "category": "Rule",
                         "owner": "AWS",
                         "provider": "LambdaInvoke",
                        "version": "1"
                    },
                    "configuration": {
                         "FunctionName": "my-function"
                    },
                    "inputArtifacts": [
                        {
                             "name": "SourceArtifact"
                        }
                    ],
                     "region": "us-east-1"
```

```
}
]
]
}
```

For more information about configuring failure conditions, see <u>FailureConditions</u> in the *CodePipeline API Reference*.

Creating On Failure conditions (CFN)

To use Amazon CloudFormation to configure an On Failure condition, use the OnFailure parameter. On success, the stage will run the rule and perform the result.

```
OnFailure:
Result: ROLLBACK
```

 Update the template as shown in the following snippet. The following example configures an OnFailure condition with a rule named MyMonitorRule:

```
name: Deploy
actions:
- name: Deploy
 actionTypeId:
    category: Deploy
   owner: AWS
    provider: S3
   version: '1'
 runOrder: 1
 configuration:
    BucketName: MyBucket
    Extract: 'false'
    ObjectKey: object.xml
 outputArtifacts: []
 inputArtifacts:
  - name: SourceArtifact
 region: us-east-1
 namespace: DeployVariables
OnFailure:
  conditions:
```

```
- result: ROLLBACK
rules:
    name: MyMonitorRule
    ruleTypeId:
        category: Rule
        owner: AWS
        provider: CloudWatchAlarm
        version: '1'
        configuration:
        AlarmName: AlarmOnHelloWorldInvocation
        AlarmStates: ALARM
        WaitTime: '1'
        inputArtifacts: []
        region: us-east-1
```

For more information about configuring failure conditions, see <u>OnFailure</u> under StageDeclaration in the *Amazon CloudFormation User Guide*.

Creating On Success conditions

You can configure On Success conditions for a stage using the console or CLI. You will configure the corresponding rules and results for each condition. For a rollback result, the pipeline can only roll back to a previous execution if the previous execution was started in the current pipeline structure version.

The steps provide an example On Success condition that uses a deployment window rule.

For more information, see Condition, RuleTypeId, and RuleExecution in the CodePipeline API Guide.

Creating On Success conditions (Console)

You can configure On Success conditions for a stage, along with the rules and results you want the stage to perform when the conditions are met.

Configure an On Success condition (console)

- 1. Complete any prerequisites, such as creating the resource and ARN for a rule where a resource is provided, such as the Amazon LambdaRule.
- 2. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 3. In Name, choose the name of the pipeline you want to edit.
- 4. On the pipeline details page, choose **Edit**.
- 5. On the **Edit** page, for the action you want to edit, choose **Edit stage**.
- 6. Choose Add success condition. The On stage success condition card displays. Choose the Rollback or Fail option shown as the available results for this condition type.
- 7. Choose **Add rule**, and then complete the following.
 - a. In **Rule name**, enter a name for your condition. For this example, enter MyDeploymentRule.
 - b. In **Rule provider**, choose the preconfigured rule to add to your condition. For this example, choose **Amazon DeploymentWindow**, and then complete the following steps.
 - c. In **Region**, choose the Region for your condition or leave the default.
 - d. In Cron, enter the cron expression for the deployment window. The cron expression defines the days and times when the deployment should be allowed. For reference information about cron expressions, see <u>Using cron and rate expressions to schedule rules</u>.
 - e. (Optional) In **TimeZone**, enter the time zone for the deployment window.
- 8. After the run, view the result.

View details	
d34def6d Source: Added simpleCov-report.json	
Disable transition	
Opploy Succeeded Pipeline execution ID: <u>8a6fe20b-9670-4a41-a5a8-be04d6750d1</u>	Start rollback
Deploy Amazon S3 🖾	
Succeeded - Just now View details	
d34def6d Source: Added simpleCov-report.json	
OnSuccess condition: 💮 In progress Execution ID: 8ae Reason: Waiting for the time window to open. This is estima	

Creating On Success conditions (CLI)

To use the Amazon CLI to configure an On Success condition, use the commands to create or update a pipeline as detailed in <u>Create a pipeline, stages, and actions</u> and <u>Edit a pipeline in</u> <u>CodePipeline</u>.

Configure the condition and rule or rules (CLI)

• Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the update-pipeline command, specifying the failure condition in the pipeline

structure. The following example configures an On Success condition for a staged named Deploy, where the rule is named MyDeploymentRule:

```
{
    "name": "Deploy",
    "actions": [
        {
            "name": "Deploy",
            "actionTypeId": {
                "category": "Deploy",
                "owner": "AWS",
                "provider": "S3",
                "version": "1"
            },
            "runOrder": 1,
            "configuration": {
                "BucketName": "MyBucket",
                "Extract": "false",
                "ObjectKey": "object.xml"
            },
            "outputArtifacts": [],
            "inputArtifacts": [
                {
                    "name": "SourceArtifact"
                }
            ],
            "region": "us-east-1",
            "namespace": "DeployVariables"
        }
    ],
    "onSuccess": {
       "conditions": [
            {
                "result": "FAIL",
                "rules": [
                    {
                         "name": "MyAlarmRule",
                         "ruleTypeId": {
                             "category": "Rule",
                             "owner": "AWS",
                             "provider": "CloudWatchAlarm",
                             "version": "1"
                         },
```

```
"configuration": {
        "AlarmName": "CWAlarm",
        "WaitTime": "1"
      },
      "inputArtifacts": [],
      "region": "us-east-1"
      }
      ]
      ]
      }
}
```

For more information about configuring success conditions, see <u>SuccessConditions</u> in the *CodePipeline API Reference*.

Create an On Success condition (CFN)

To use Amazon CloudFormation to configure an On Success condition, use the OnSuccess parameter. On success, the stage will run the rule and perform the result.

OnSuccess: Result: ROLLBACK

• Update the template as shown in the following snippet. The following example configures an OnSuccess condition with a rule named MyDeploymentWindowRule:

```
name: Deploy
actions:
- name: Deploy
actionTypeId:
   category: Deploy
   owner: AWS
   provider: S3
   version: '1'
runOrder: 1
   configuration:
    BucketName: MyBucket
    Extract: 'false'
    ObjectKey: object.xml
   outputArtifacts: []
```

```
inputArtifacts:
  - name: SourceArtifact
  region: us-east-1
  namespace: DeployVariables
onSuccess:
  conditions:
  - result: FAIL
   rules:
    - name: MyMonitorRule
     ruleTypeId:
        category: Rule
        owner: AWS
        provider: CloudWatchAlarm
        version: '1'
      configuration:
        AlarmName: CWAlarm
        WaitTime: '1'
      inputArtifacts: []
      region: us-east-1
```

For more information about configuring failure conditions for stage rollback, see <u>OnFailure</u> under StageDeclaration in the *Amazon CloudFormation User Guide*.

Deleting stage conditions

You can delete stage conditions that have been configured for your pipeline.

To delete a stage condition

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names and status of all pipelines associated with your Amazon Web Services account are displayed.

- 2. In Name, choose the name of the pipeline you want to edit.
- 3. On the pipeline details page, choose **Edit**.
- 4. On the **Edit** page, for the condition you want to edit, choose **Edit stage**.
- 5. Next to the condition that you want to delete, choose **Delete condition**.

Overriding stage conditions

You can override stage conditions that have been configured for your pipeline. In the console, when the stage and rule are running, you can choose to override the stage condition. This results in the stage running

To override a stage condition

1. In this example, the pipeline stage is running with a condition. The **Override** button is enabled.

Disable transition	
Deploy In progress	Ø
Pipeline execution ID: 8a6fe20b-9670-4a41-a5a8-be04d6750d1c	٢
Deploy	
Amazon S3 🖸	
Succeeded - <u>3 minutes ago</u>	
View details	
d34def6d Source: Added simpleCov-report.json	
OnSuccess condition: 💬 In progress Execution ID: 8ac Override condition Review	
Reason: Waiting for the time window to open. This is estimated to happen in >1 week.	

2. Next to the condition that you want to override, choose **Override**.

Start rollback

Review

3. To review details, choose **Review**. The detail in the following example shows that the configured result for the condition is Fail, which has been overridden. The rule status is Abandoned due to the override.

Condition execution details Execution ID: 8a6fe20b-9670-4a41-a5a8-be04d6750d1c				
Condition type: OnSuccess Rule states:	Result: FAIL Status: V Overridden			
Name	Rule Execution ID	Status	Reason	
MyDeploymentRule	2e5989ea-b59d-4ae8-93fb-5a47538956bb	Abandoned	-	

Amazon CodePipe	line
	Disable transition

Deploy Amazon S3

⊘ Deploy ③ Succeeded

Succeeded ~ 5 minutes ago

d34def6d Source: Added simpleCov-report.json

View details

Pipeline execution ID: 8a6fe20b-9670-4a41-a5a8-be04d6750d1c

OnSuccess condition: V Overridden Execution ID: 8a6fe20b

Done

Use action types, custom actions, and approval actions

In Amazon CodePipeline, an action is part of the sequence in a stage of a pipeline. It is a task performed on the artifact in that stage. Pipeline actions occur in a specified order, in sequence or in parallel, as determined in the configuration of the stage.

CodePipeline provides support for six types of actions:

- Source
- Build
- Test
- Deploy
- Approval
- Invoke

For information about the Amazon Web Services service and partner products and services you can integrate into your pipeline based on action type, see Integrations with CodePipeline action types.

Topics

- Working with action types
- Create and add a custom action in CodePipeline
- Tag a custom action in CodePipeline
- Invoke an Amazon Lambda function in a pipeline in CodePipeline
- Add a manual approval action to a stage
- Add a cross-Region action in CodePipeline
- Working with variables

Working with action types

Action types are preconfigured actions that you as a provider create for customers by using one of the supported integration models in Amazon CodePipeline.

You can request, view, and update action types. If the action type is created for your account as the owner, you can use the Amazon CLI to view or update your action type properties and structure. If

you are the provider or owner of the action type, your customers can choose the action and add it to their pipelines after it is available in CodePipeline.

🚯 Note

You create actions with custom in the owner field to run with a job worker. You do not create them with an integration model. For information about custom actions, see <u>Create</u> and add a custom action in CodePipeline.

Action type components

The following components make up an action type.

Action type ID – The *ID* consists of the category, owner, provider, and version. The following
example shows an action type ID with an owner of ThirdParty, a category of Test, a provider
named TestProvider, and a version of 1.

```
{
    "Category": "Test",
    "Owner": "ThirdParty",
    "Provider": "TestProvider",
    "Version": "1"
},
```

- **Executor configuration** The integration model, or action engine, specified when the action is created. When you specify the executor for an action type, you choose one of two types:
 - *Lambda:* The action type owner writes the integration as a Lambda function, which is invoked by CodePipeline whenever there is a job available for the action.
 - *JobWorker:* The action type owner writes the integration as a job worker that polls for available jobs on customer pipelines. The job worker then runs the job and submits the job result back to CodePipeline by using CodePipeline APIs.

1 Note

The job worker integration model is not the preferred integration model.

User Guide

- Input and output artifacts: Limits for the artifacts that the action type owner designates for customers of the action.
- **Permissions:** The permissions strategy that designates customers who can access the third-party action type. The permissions strategies available depend on the chosen integration model for the action type.
- URLs: Deep links to resources that the customer can interact with, such as the action type owner's configuration page.

Topics

- <u>Request an action type</u>
- Add an available action type to a pipeline (console)
- View an action type
- Update an action type

Request an action type

When a new CodePipeline action type is requested by a third-party provider, the action type is created for the action type owner in CodePipeline, and the owner can manage and view the action type.

An action type can be either a private or public action. When your action type is created, it is private. To request an action type be changed to a public action, contact the CodePipeline service team.

Before you create your action definition file, executor resources, and action type request for the CodePipeline team, you must choose an integration model.

Step 1: Choose your integration model

Choose your integration model and then create the configuration for that model. After you choose the integration model, you must configure your integration resources.

• For the Lambda integration model, you create a Lambda function and add permissions. Add permissions to your integrator Lambda function to provide the CodePipeline service with permissions to invoke it using the CodePipeline service principal: codepipeline.amazonaws.com. The permissions can be added using Amazon CloudFormation or the command line.

• Example for adding permissions using Amazon CloudFormation:

```
CodePipelineLambdaBasedActionPermission:
   Type: 'AWS::Lambda::Permission'
   Properties:
    Action: 'lambda:invokeFunction'
    FunctionName: {"Fn::Sub": "arn:${AWS::Partition}:lambda:${AWS::Region}:
   ${AWS::AccountId}:function:function-name"}
    Principal: codepipeline.amazonaws.com
```

- Documentation for command line
- For the job worker integration model, you create an integration with a list of allowed accounts where the job worker polls for jobs with the CodePipeline APIs.

Step 2: Create an action type definition file

You define an action type in an action type definition file using JSON. In the file, you include the action category, the integration model used to manage the action type, and configuration properties.

🚯 Note

After you create a public action, you can't change the action type property under properties from optional to required. You also can't change the owner.

For more information about the action type definition file parameters, see <u>ActionTypeDeclaration</u> and <u>UpdateActionType</u> in the <u>CodePipeline API Reference</u>.

There are eight sections in the action type definition file:

- description: The description for the action type to be updated.
- executor: Information about the executor for an action type that was created with a supported integration model, either Lambda or job worker. You can only provide either jobWorkerExecutorConfiguration or lambdaExecutorConfiguration, based on your executor type.

- configuration: Resources for the configuration of the action type, based on the chosen integration model. For the Lambda integration model, use the Lambda function ARN. For the job worker integration model, use the account or list of accounts from where the job worker runs.
- jobTimeout: The timeout in seconds for the job. An action execution can consist of multiple jobs. This is the timeout for a single job, and not for the entire action execution.

🚯 Note

For the Lambda integration model, the maximum timeout is 15 minutes.

- policyStatementsTemplate: The policy statement that specifies the permissions in the CodePipeline customer's account that are needed to successfully run an action execution.
- type: The integration model used to create and update the action type, either Lambda or JobWorker.
- id: The category, owner, provider, and version ID for the action type:
 - category: The kind of action can be taken in the stage: Source, Build, Deploy, Test, Invoke, or Approval.
 - provider: The provider of the action type being called, such as the provider company or product name. The provider name is supplied when the action type is created.
 - owner: The creator of the action type being called: AWS or ThirdParty.
 - version: A string used to version the action type. For the first version, set the version number to 1.
- inputArtifactDetails: The number of artifacts to expect from the previous stage in the pipeline.
- outputArtifactDetails: The number of artifacts to expect from the result from the action type stage.
- permissions: Details identifying the accounts with permissions to use the action type.
- properties: The parameters required for your project tasks to complete.
 - description: The description of the property that is displayed to users.
 - optional: Whether the configuration property is optional.
 - noEcho: Whether the field value entered by the customer is omitted from the log. If true, then the value is redacted when returned with a GetPipeline API request.
 - key: Whether the configuration property is a key.

- queryable: Whether the property is used with polling. An action type can have up to one queryable property. If it has one, that property must be both required and not secret.
- name: The property name that is displayed to users.
- urls: A list of the URLs CodePipeline displays to your users.
 - entityUrlTemplate: URL to the external resources for the action type, such as a configuration page.
 - executionUrlTemplate: URL to the details for the latest run of the action.
 - revisionUrlTemplate: URL displayed in the CodePipeline console to the page where customers can update or change the configuration of the external action.
 - thirdPartyConfigurationUrl: URL of a page where users can sign up for an external service and perform initial configuration of the action provided by that service.

The following code shows an example action type definition file.

```
{
   "actionType": {
      "description": "string",
      "executor": {
         "configuration": {
            "jobWorkerExecutorConfiguration": {
               "pollingAccounts": [ "string" ],
               "pollingServicePrincipals": [ "string" ]
            },
            "lambdaExecutorConfiguration": {
               "lambdaFunctionArn": "string"
            }
         },
         "jobTimeout": number,
         "policyStatementsTemplate": "string",
         "type": "string"
      },
      "id": {
         "category": "string",
         "owner": "string",
         "provider": "string",
         "version": "string"
      },
      "inputArtifactDetails": {
         "maximumCount": number,
```

```
"minimumCount": number
      },
      "outputArtifactDetails": {
         "maximumCount": number,
         "minimumCount": number
      },
      "permissions": {
         "allowedAccounts": [ "string" ]
      },
      "properties": [
         {
            "description": "string",
            "key": boolean,
            "name": "string",
            "noEcho": boolean,
            "optional": boolean,
            "queryable": boolean
         }
      ],
      "urls": {
         "configurationUrl": "string",
         "entityUrlTemplate": "string",
         "executionUrlTemplate": "string",
         "revisionUrlTemplate": "string"
      }
   }
}
```

Step 3: Register Your Integration with CodePipeline

To register your action type with CodePipeline, you contact the CodePipeline service team with your request.

The CodePipeline service team registers the new action type integration by making changes in the service codebase. CodePipeline registers two new actions: a *public action* and a *private action*. You use the private action for testing, and then when ready, you activate the public action to serve customer traffic.

To register a request for a Lambda integration

• Send a request to the CodePipeline service team using the following form.

```
This issue will track the onboarding of [Name] in CodePipeline.
[Contact engineer] will be the primary point of contact for this integration.
Name of the action type as you want it to appear to customers: Example.com Testing
Initial onboard checklist:
1. Attach an action type definition file in JSON format. This includes the schema
for the action type
2. A list of test accounts for the allowlist which can access the new action type
[{account, account_name}]
3. The Lambda function ARN
4. List of Amazon Web Services Regions where your action will be available
5. Will this be available as a public action?
```

To register a request for a job worker integration

• Send a request to the CodePipeline service team using the following form.

This issue will track the onboarding of [Name] in CodePipeline.
[Contact engineer] will be the primary point of contact for this integration.
Name of the action type as you want it to appear to customers: Example.com Testing
Initial onboard checklist:
1. Attach an action type definition file in JSON format. This includes the schema
for the action type.
2. A list of test accounts for the allowlist which can access the new action type
[{account, account_name}]
3. URL information:

Website URL: https://www.example.com/%TestThirdPartyName%/%TestVersionNumber%
Example URL pattern where customers will be able to review their configuration
information for the action: https://www.example.com/%TestThirdPartyName%/
%customer-ID%/%CustomerActionConfiguration%
Example runtime URL pattern: https://www.example.com/%TestThirdPartyName%/
%customer-ID%/%TestRunId%
4. List of Amazon Web Services Regions where your action will be available
5. Will this be available as a public action?

Step 4: Activate Your New Integration

Contact the CodePipeline service team when you are ready to use the new integration publicly.

Add an available action type to a pipeline (console)

You add your action type to a pipeline so that you can test it. You can do this by creating a new pipeline or editing an existing one.

Note

If your action type is a source, build, or deploy category action, you can add it by creating a pipeline. If your action type is in the test category, you must add it by editing an existing pipeline.

To add your action type to an existing pipeline from the CodePipeline console

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. In the list of pipelines, choose the pipeline where you want to add the action type.
- 3. On the summary view page of the pipeline, choose **Edit**.
- 4. Choose to edit the stage. In the stage where you want to add your action type, choose **Add action group**. The **Edit action** page displays.
- 5. On the **Edit action** page, in **Action name**, enter a name for the action. This is the name that displays for the stage in your pipeline.

6. In Action provider, choose your action type from the list.

Note that the value in the list is based on the provider specified in the action type definition file.

7. In **Input artifacts**, enter the artifact name in this format:

Artifactname::FileName

Note that the minimum and maximum quantities allowed are defined based on the inputArtifactDetails specified in the action type definition file.

8. Choose **Connect to <Action_Name>**.

A browser window opens and connects to the website you have created for your action type.

- 9. Log in to your website as a customer and complete the steps a customer takes to use your action type. Your steps will vary depending on your action category, website, and configuration, but usually includes a completion action that returns the customer to the **Edit action** page.
- 10. In the CodePipeline **Edit action** page, the additional configuration fields for the action display. The fields that display are the configuration properties that you specified in the action definition file. Enter theinformation in the fields that are customized for your action type.

For example, if the action definition file specified a property named Host, then a field with the label **Host** is shown on the **Edit action** page for your action.

11. In **Output artifacts**, enter the artifact name in this format:

Artifactname::FileName

Note that the minimum and maximum quantities allowed are defined based on the outputArtifactDetails specified in the action type definition file.

12. Choose **Done** to return to the pipeline details page.

🚺 Note

Your customers can optionally use the CLI to add the action type to their pipeline.

13. To test your action, commit a change to the source specified in the source stage of the pipeline or follow the steps in Manually Start a Pipeline.

To create a pipeline with your action type, follow the steps in <u>Create a pipeline, stages, and actions</u> and choose your action type from as many stages as you will test.

View an action type

You can use the CLI to view your action type. Use the **get-action-type** command to view action types that have been created using an integration model.

To view an action type

1. Create an input JSON file and name the file file.json. Add your action type ID in JSON format as shown in the following example.

```
{
    "category": "Test",
    "owner": "ThirdParty",
    "provider": "TestProvider",
    "version": "1"
}
```

2. In a terminal window or at the command line, run the **get-action-type** command.

```
aws codepipeline get-action-type --cli-input-json file://file.json
```

This command returns the action definition output for an action type. This example shows an action type that was created with the Lambda integration model.

```
"version": "1"
        },
        "inputArtifactDetails": {
             "minimumCount": 0,
            "maximumCount": 1
        },
        "outputArtifactDetails": {
             "minimumCount": 0,
             "maximumCount": 1
        },
        "permissions": {
            "allowedAccounts": [
                 "<account-id>"
            ]
        },
        "properties": []
    }
}
```

Update an action type

You can use the CLI to edit action types that are created with an integration model.

For a public action type, you can't update the owner, you can't change optional properties to required, and you can only add new optional properties.

- 1. Use the get-action-type command to get the structure for your action type. Copy the structure.
- 2. Create an input JSON file and name it action.json. Paste the action type structure you copied in the previous step into it. Update any parameters you want to change. You can also add optional parameters.

For more information about the parameters for the input file, see the action definition file description in Step 2: Create an action type definition file.

The following example shows how to update an example action type created with the Lambda integration model. This example makes the following changes:

- Changes the provider name to TestProvider1.
- Add a job timeout limit of 900 seconds.

 Adds an action configuration property named Host that is displayed to the customer using the action.

```
{
    "actionType": {
        "executor": {
            "configuration": {
                "lambdaExecutorConfiguration": {
                     "lambdaFunctionArn": "arn:aws:lambda:us-west-2:<account-
id>:function:my-function"
                }
            },
            "type": "Lambda",
            "jobTimeout": 900
        },
        "id": {
            "category": "Test",
            "owner": "ThirdParty",
            "provider": "TestProvider1",
            "version": "1"
        },
        "inputArtifactDetails": {
            "minimumCount": 0,
            "maximumCount": 1
        },
        "outputArtifactDetails": {
            "minimumCount": 0,
            "maximumCount": 1
        },
        "permissions": {
            "allowedAccounts": [
                "account-id"
            ]
        },
        "properties": {
         "description": "Owned build action parameter description",
         "optional": true,
         "noEcho": false,
         "key": true,
         "queryable": false,
         "name": "Host"
         }
```

}

3. At the terminal or command line, run the **update-action-type** command

```
aws codepipeline update-action-type --cli-input-json file://action.json
```

This command returns the action type output to match your updated parameters.

Create and add a custom action in CodePipeline

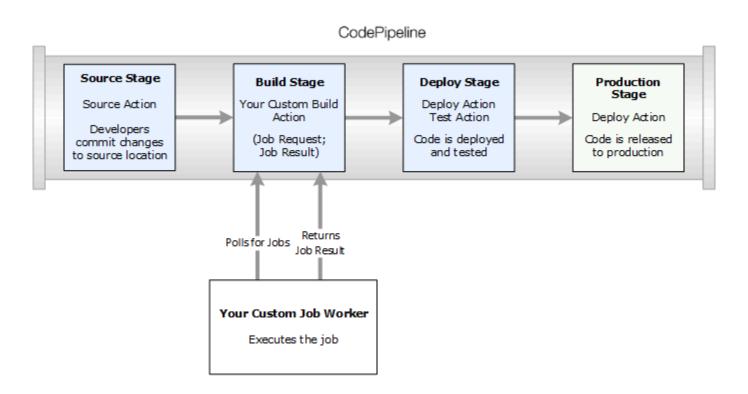
Amazon CodePipeline includes a number of actions that help you configure build, test, and deploy resources for your automated release process. If your release process includes activities that are not included in the default actions, such as an internally developed build process or a test suite, you can create a custom action for that purpose and include it in your pipeline. You can use the Amazon CLI to create custom actions in pipelines associated with your Amazon account.

You can create custom actions for the following Amazon CodePipeline action categories:

- A custom build action that builds or transforms the items
- A custom deploy action that deploys items to one or more servers, websites, or repositories
- A custom test action that configures and runs automated tests
- A custom invoke action that runs functions

When you create a custom action, you must also create a job worker that will poll CodePipeline for job requests for this custom action, execute the job, and return the status result to CodePipeline. This job worker can be located on any computer or resource as long as it has access to the public endpoint for CodePipeline. To easily manage access and security, consider hosting your job worker on an Amazon EC2 instance.

The following diagram shows a high-level view of a pipeline that includes a custom build action:



When a pipeline includes a custom action as part of a stage, the pipeline will create a job request. A custom job worker detects that request and performs that job (in this example, a custom process using third-party build software). When the action is complete, the job worker returns either a success result or a failure result. If a success result is received, the pipeline will provide the revision and its artifacts to the next action. If a failure is returned, the pipeline will not provide the revision to the next action in the pipeline.

🚯 Note

These instructions assume that you have already completed the steps in <u>Getting started</u> <u>with CodePipeline</u>.

Topics

- <u>Create a custom action</u>
- <u>Create a job worker for your custom action</u>
- Add a custom action to a pipeline

Create a custom action

To create a custom action with the Amazon CLI

 Open a text editor and create a JSON file for your custom action that includes the action category, the action provider, and any settings required by your custom action. For example, to create a custom build action that requires only one property, your JSON file might look like this:

```
{
    "category": "Build",
    "provider": "My-Build-Provider-Name",
    "version": "1",
    "settings": {
        "entityUrlTemplate": "https://my-build-instance/job/{Config:ProjectName}/",
        "executionUrlTemplate": "https://my-build-instance/job/
{Config:ProjectName}/lastSuccessfulBuild/{ExternalExecutionId}/"
    },
    "configurationProperties": [{
        "name": "ProjectName",
        "required": true,
        "key": true,
        "secret": false,
        "queryable": false,
        "description": "The name of the build project must be provided when this
 action is added to the pipeline.",
        "type": "String"
    }],
    "inputArtifactDetails": {
        "maximumCount": integer,
        "minimumCount": integer
    },
    "outputArtifactDetails": {
        "maximumCount": integer,
        "minimumCount": integer
    },
    "tags": [{
      "key": "Project",
      "value": "ProjectA"
    }]
}
```

This example adds tagging to the custom action by including the Project tag key and ProjectA value on the custom action. For more information about tagging resources in CodePipeline, see Tagging resources.

There are two properties included in the JSON file, entityUrlTemplate and executionUrlTemplate. You can refer to a name in the configuration properties of the custom action within the URL templates by following the format of {Config:name}, as long as the configuration property is both required and not secret. For example, in the sample above, the entityUrlTemplate value refers to the configuration property *ProjectName*.

- entityUrlTemplate: the static link that provides information about the service provider for the action. In the example, the build system includes a static link to each build project. The link format will vary, depending on your build provider (or, if you are creating a different action type, such as test, other service provider). You must provide this link format so that when the custom action is added, the user can choose this link to open a browser to a page on your website that provides the specifics for the build project (or test environment).
- executionUrlTemplate: the dynamic link that will be updated with information about the current or most recent run of the action. When your custom job worker updates the status of a job (for example, success, failure, or in progress), it will also provide an externalExecutionId that will be used to complete the link. This link can be used to provide details about the run of an action.

For example, when you view the action in the pipeline, you see the following two links:



1

2

This static link appears after you add your custom action and points to the address in entityUrlTemplate, which you specify when you create your custom action.

This dynamic link is updated after every run of the action and points to the address in executionUrlTemplate, which you specify when you create your custom action.

For more information about these link types, as well as RevisionURLTemplate and ThirdPartyURL, see <u>ActionTypeSettings</u> and <u>CreateCustomActionType</u> in the <u>CodePipeline</u> <u>API Reference</u>. For more information about action structure requirements and how to create an action, see <u>CodePipeline pipeline structure reference</u>.

- Save the JSON file and give it a name you can easily remember (for example, MyCustomAction.json).
- 3. Open a terminal session (Linux, OS X, Unix) or command prompt (Windows) on a computer where you have installed the Amazon CLI.
- 4. Use the Amazon CLI to run the **aws codepipeline create-custom-action-type** command, specifying the name of the JSON file you just created.

For example, to create a build custom action:

🔥 Important

Be sure to include file:// before the file name. It is required in this command.

```
aws codepipeline create-custom-action-type --cli-input-json
file://MyCustomAction.json
```

5. This command returns the entire structure of the custom action you created, as well as the JobList action configuration property, which is added for you. When you add the custom action to a pipeline, you can use JobList to specify which projects from the provider you can poll for jobs. If you do not configure this, all available jobs will be returned when your custom job worker polls for jobs.

For example, the preceding command might return a structure similar to the following:

```
{
    "actionType": {
        "inputArtifactDetails": {
            "maximumCount": 1,
            "minimumCount": 1
       },
       "actionConfigurationProperties": [
            {
                "secret": false,
                "required": true,
                "name": "ProjectName",
                "key": true,
                "description": "The name of the build project must be provided when
 this action is added to the pipeline."
            }
        ],
        "outputArtifactDetails": {
            "maximumCount": 0,
            "minimumCount": 0
        },
        "id": {
            "category": "Build",
            "owner": "Custom",
            "version": "1",
            "provider": "My-Build-Provider-Name"
        },
        "settings": {
            "entityUrlTemplate": "https://my-build-instance/job/
{Config:ProjectName}/",
            "executionUrlTemplate": "https://my-build-instance/job/mybuildjob/
lastSuccessfulBuild/{ExternalExecutionId}/"
        }
    }
}
```

🚯 Note

As part of the output of the **create-custom-action-type** command, the id section includes "owner": "Custom". CodePipeline automatically assigns Custom as the

owner of custom action types. This value can't be assigned or changed when you use the **create-custom-action-type** command or the **update-pipeline** command.

Create a job worker for your custom action

Custom actions require a job worker that will poll CodePipeline for job requests for the custom action, execute the job, and return the status result to CodePipeline. The job worker can be located on any computer or resource as long as it has access to the public endpoint for CodePipeline.

There are many ways to design your job worker. The following sections provide some practical guidance for developing your custom job worker for CodePipeline.

Topics

- Choose and configure a permissions management strategy for your job worker
- Develop a job worker for your custom action
- Custom job worker architecture and examples

Choose and configure a permissions management strategy for your job worker

To develop a custom job worker for your custom action in CodePipeline, you will need a strategy for the integration of user and permission management.

The simplest strategy is to add the infrastructure you need for your custom job worker by creating Amazon EC2 instances with an IAM instance role, which allow you to easily scale up the resources you need for your integration. You can use the built-in integration with Amazon to simplify the interaction between your custom job worker and CodePipeline.

To set up Amazon EC2 instances

- 1. Learn more about Amazon EC2 and determine whether it is the right choice for your integration. For information, see Amazon EC2 Virtual Server Hosting.
- 2. Get started creating your Amazon EC2 instances. For information, see <u>Getting Started with</u> <u>Amazon EC2 Linux Instances</u>.

Another strategy to consider is using identity federation with IAM to integrate your existing identity provider system and resources. This strategy is particularly useful if you already have a

corporate identity provider or are already configured to support users using web identity providers. Identity federation allows you to grant secure access to Amazon resources, including CodePipeline, without having to create or manage IAM users. You can use features and policies for password security requirements and credential rotation. You can use sample applications as templates for your own design.

To set up identity federation

- 1. Learn more about IAM identity federation. For information, see Manage Federation.
- 2. Review the examples in <u>Scenarios for Granting Temporary Access</u> to identify the scenario for temporary access that best fits the needs of your custom action.
- 3. Review code examples of identity federation relevant to your infrastructure, such as:
 - Identity Federation Sample Application for an Active Directory Use Case
- 4. Get started configuring identity federation. For information, see <u>Identity Providers and</u> <u>Federation</u> in *IAM User Guide*.

Ceate one of the following to use under your Amazon Web Services account when running your custom action and job worker.

Users need programmatic access if they want to interact with Amazon outside of the Amazon Web Services Management Console. The Amazon APIs and the Amazon Command Line Interface require access keys. Whenever possible, create temporary credentials that consist of an access key ID, a secret access key, and a security token that indicates when the credentials expire.

To grant users programmatic access, choose one of the following options.

Which user needs programmatic access?	То	Ву
ΙΑΜ	Use short-term credentials to sign programmatic requests to the Amazon CLI or Amazon APIs (directly or by using the Amazon SDKs).	Following the instructions in Using temporary credentials with Amazon resources in the IAM User Guide.

Which user needs programmatic access?	То	Ву
IAM	(Not recommended) Use long-term credentials to sign programmatic requests to the Amazon CLI or Amazon APIs (directly or by using the Amazon SDKs).	Following the instructions in Managing access keys for IAM users in the IAM User Guide.

The following is an example policy you might create for use with your custom job worker. This policy is meant as an example only and is provided as-is.

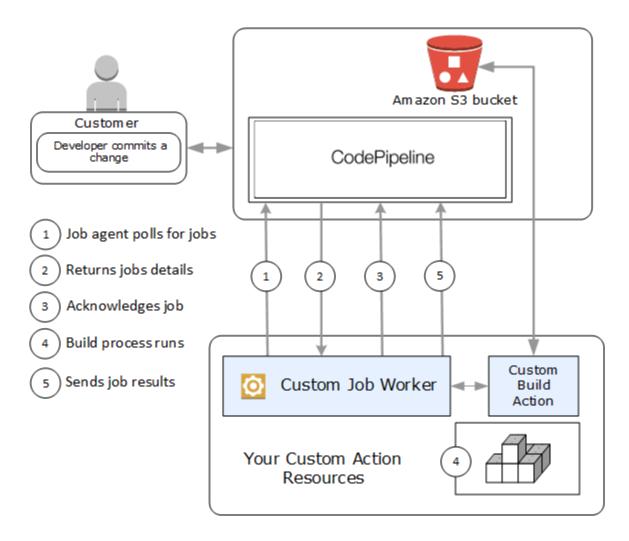


(i) Note

Consider using the AWSCodePipelineCustomActionAccess managed policy.

Develop a job worker for your custom action

After you've chosen your permissions management strategy, you should consider how your job worker will interact with CodePipeline. The following high-level diagram shows the workflow of a custom action and job worker for a build process.



- 1. Your job worker polls CodePipeline for jobs using PollForJobs.
- 2. When a pipeline is triggered by a change in its source stage (for example, when a developer commits a change), the automated release process begins. The process continues until the stage at which your custom action has been configured. When it reaches your action in this stage, CodePipeline queues a job. This job will appear if your job worker calls PollForJobs again to get status. Take the job detail from PollForJobs and pass it back to your job worker.

- 3. The job worker calls AcknowledgeJob to send CodePipeline a job acknowledgment. CodePipeline returns an acknowledgment that indicates the job worker should continue the job (InProgress), or, if you have more than one job worker polling for jobs and another job worker has already claimed the job, an InvalidNonceException error response will be returned. After the InProgress acknowledgment, CodePipeline waits for results to be returned.
- 4. The job worker initiates your custom action on the revision, and then your action runs. Along with any other actions, your custom action returns a result to the job worker. In the example of a build custom action, the action pulls artifacts from the Amazon S3 bucket, builds them, and pushes successfully built artifacts back to the Amazon S3 bucket.
- 5. While the action is running, the job worker can call PutJobSuccessResult with a continuation token (the serialization of the state of the job generated by the job worker, for example a build identifier in JSON format, or an Amazon S3 object key), as well as the ExternalExecutionId information that will be used to populate the link in executionUrlTemplate. This will update the console view of the pipeline with a working link to specific action details while it is in progress. Although not required, it is a best practice because it enables users to view the status of your custom action while it runs.

Once PutJobSuccessResult is called, the job is considered complete. A new job is created in CodePipeline that includes the continuation token. This job will appear if your job worker calls PollForJobs again. This new job can be used to check on the state of the action, and either returns with a continuation token, or returns without a continuation token once the action is complete.

i Note

If your job worker performs all the work for a custom action, you should consider breaking your job worker processing into at least two steps. The first step establishes the details page for your action. Once you have created the details page, you can serialize the state of the job worker and return it as a continuation token, subject to size limits (see <u>Quotas in Amazon CodePipeline</u>). For example, you could write the state of the action into the string you use as the continuation token. The second step (and subsequent steps) of your job worker processing perform the actual work of the action. The final step returns success or failure to CodePipeline, with no continuation token on the final step. For more information about using the continuation token, see the specifications for PutJobSuccessResult in the CodePipeline API Reference.

- 6. Once the custom action completes, the job worker returns the result of the custom action to CodePipeline by calling one of two APIs:
 - PutJobSuccessResult without a continuation token, which indicates the custom action ran successfully
 - PutJobFailureResult, which indicates the custom action did not run successfully

Depending on the result, the pipeline will either continue on to the next action (success) or stop (failure).

Custom job worker architecture and examples

After you have mapped out your high-level workflow, you can create your job worker. Although the specifics of your custom action will ultimately determine what is needed for your job worker, most job workers for custom actions include the following functionality:

- Polling for jobs from CodePipeline using PollForJobs.
- Acknowledging jobs and returning results to CodePipeline using AcknowledgeJob, PutJobSuccessResult, and PutJobFailureResult.
- Retrieving artifacts from and/or putting artifacts into the Amazon S3 bucket for the pipeline. To download artifacts from the Amazon S3 bucket, you must create an Amazon S3 client that uses Signature Version 4 signing (Sig V4). Sig V4 is required for Amazon KMS.

To upload artifacts to the Amazon S3 bucket, you must additionally configure the Amazon S3 <u>PutObject</u> request to use encryption. Currently only Amazon Key Management Service (Amazon KMS) is supported for encryption. Amazon KMS uses Amazon KMS keys. In order to know whether to use an Amazon managed key or a customer managed key to upload artifacts, your custom job worker must look at the job data and check the <u>encryption key</u> property. If the property is set, you should use that customer managed key ID when configuring Amazon KMS. If the key property is null, you use the Amazon managed key. CodePipeline uses the Amazon managed key unless otherwise configured.

For an example that shows how to create the Amazon KMS parameters in Java or .NET, see <u>Specifying the Amazon Key Management Service in Amazon S3 Using the Amazon SDKs</u>. For more information about the Amazon S3 bucket for CodePipeline, see CodePipeline concepts.

A more complex example of a custom job worker is available on GitHub. This sample is open source and provided as-is.

• Sample Job Worker for CodePipeline: Download the sample from the GitHub repository.

Add a custom action to a pipeline

After you have a job worker, you can add your custom action to a pipeline by creating a new one and choosing it when you use the Create Pipeline wizard, by editing an existing pipeline and adding the custom action, or by using the Amazon CLI, the SDKs, or the APIs.

Note

You can create a pipeline in the Create Pipeline wizard that includes a custom action if it is a build or deploy action. If your custom action is in the test category, you must add it by editing an existing pipeline.

Topics

• Add a custom action to an existing pipeline (CLI)

Add a custom action to an existing pipeline (CLI)

You can use the Amazon CLI to add a custom action to an existing pipeline.

 Open a terminal session (Linux, OS X, or Unix) or command prompt (Windows) and run the get-pipeline command to copy the pipeline structure you want to edit into a JSON file. For example, for a pipeline named MyFirstPipeline, you would type the following command:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Open the JSON file in any text editor and modify the structure of the file to add your custom action to an existing stage.

🚯 Note

If you want your action to run in parallel with another action in that stage, make sure you assign it the same runOrder value as that action.

For example, to modify the structure of a pipeline to add a stage named Build and to add a build custom action to that stage, you might modify the JSON to add the Build stage before a deployment stage as follows:

```
{
  "name": "MyBuildStage",
  "actions": [
          {
            "inputArtifacts": [
            {
               "name": "MyApp"
             }
               ],
                "name": "MyBuildCustomAction",
                "actionTypeId": {
                    "category": "Build",
                    "owner": "Custom",
                    "version": "1",
                     "provider": "My-Build-Provider-Name"
                },
                "outputArtifacts": [
                    ſ
                       "name": "MyBuiltApp"
                    }
                ],
                "configuration": {
                     "ProjectName": "MyBuildProject"
                },
```

```
"runOrder": 1
                }
            ]
        },
        {
            "name": "Staging",
            "actions": [
                     {
                         "inputArtifacts": [
                             {
                                 "name": "MyBuiltApp"
                             }
                         ],
                         "name": "Deploy-CodeDeploy-Application",
                         "actionTypeId": {
                             "category": "Deploy",
                             "owner": "AWS",
                             "version": "1",
                             "provider": "CodeDeploy"
                         },
                         "outputArtifacts": [],
                         "configuration": {
                             "ApplicationName": "CodePipelineDemoApplication",
                             "DeploymentGroupName": "CodePipelineDemoFleet"
                         },
                         "runOrder": 1
                     }
                ]
             }
    ]
}
```

3. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file, similar to the following:

🛕 Important

Be sure to include file:// before the file name. It is required in this command.

aws codepipeline update-pipeline --cli-input-json file://pipeline.json

This command returns the entire structure of the edited pipeline.

4. Open the CodePipeline console and choose the name of the pipeline you just edited.

The pipeline shows your changes. The next time you make a change to the source location, the pipeline will run that revision through the revised structure of the pipeline.

Tag a custom action in CodePipeline

Tags are key-value pairs associated with Amazon resources. You can use the console or the CLI to apply tags to your custom actions in CodePipeline. For information about CodePipeline resource tagging, use cases, tag key and value constraints, and supported resource types, see <u>Tagging</u> resources.

You can add, remove, and update the values of tags in a custom action. You can add up to 50 tags to each custom action.

Topics

- Add tags to a custom action
- View tags for a custom action
- Edit tags for a custom action
- <u>Remove tags from a custom action</u>

Add tags to a custom action

Follow these steps to use the Amazon CLI to add a tag to a custom action. To add a tag to a custom action when you create it, see Create and add a custom action in CodePipeline.

In these steps, we assume that you have already installed a recent version of the Amazon CLI or updated to the current version. For more information, see <u>Installing the Amazon Command Line</u> <u>Interface</u>.

At the terminal or command line, run the **tag-resource** command, specifying the Amazon Resource Name (ARN) of the custom action where you want to add tags and the key and value of the tag you want to add. You can add more than one tag to a custom action. For example, to tag a custom action with two tags, a tag key named *TestActionType* with the tag value of *UnitTest*, and a tag key named *ApplicationName* with the tag value of *MyApplication*:

```
aws codepipeline tag-resource --resource-arn arn:aws:codepipeline:us-west-2:account-
id:actiontype:Owner/Category/Provider/Version --tags key=TestActionType,value=UnitTest
key=ApplicationName,value=MyApplication
```

If successful, this command returns nothing.

View tags for a custom action

Follow these steps to use the Amazon CLI to view the Amazon tags for a custom action. If no tags have been added, the returned list is empty.

At the terminal or command line, run the **list-tags-for-resource** command. For example, to view a list of tag keys and tag values for a custom action with the ARN arn:aws:codepipeline:*us-west-2*:account-id:actiontype:*Owner/Category/Provider/Version*:

```
aws codepipeline list-tags-for-resource --resource-arn arn:aws:codepipeline:us-
west-2:account-id:actiontype:Owner/Category/Provider/Version
```

If successful, this command returns information similar to the following:

```
{
    "tags": {
        "TestActionType": "UnitTest",
        "ApplicationName": "MyApplication"
    }
}
```

Edit tags for a custom action

Follow these steps to use the Amazon CLI to edit a tag for a custom action. You can change the value for an existing key or add another key. You can also remove tags from a custom action, as shown in the next section.

At the terminal or command line, run the **tag-resource** command, specifying the Amazon Resource Name (ARN) of the custom action where you want to update a tag and specify the tag key and tag value:

```
aws codepipeline tag-resource --resource-arn arn:aws:codepipeline:us-
west-2:account-id:actiontype:Owner/Category/Provider/Version --tags
key=TestActionType,value=IntegrationTest
```

Remove tags from a custom action

Follow these steps to use the Amazon CLI to remove a tag from a custom action. When you remove tags from the associated resource, the tags are deleted.

Note

If you delete a custom action, all tag associations are removed from the deleted custom action. You do not have to remove tags before deleting a custom action.

At the terminal or command line, run the **untag-resource** command, specifying the ARN of the custom action where you want to remove tags and the tag key of the tag you want to remove. For example, to remove a tag on a custom action with the tag key *TestActionType*:

```
aws codepipeline untag-resource --resource-arn arn:aws:codepipeline:us-west-2:account-
id:actiontype:Owner/Category/Provider/Version --tag-keys TestActionType
```

If successful, this command returns nothing. To verify the tags associated with the custom action, run the **list-tags-for-resource** command.

Invoke an Amazon Lambda function in a pipeline in CodePipeline

<u>Amazon Lambda</u> is a compute service that lets you run code without provisioning or managing servers. You can create Lambda functions and add them as actions in your pipelines. Because Lambda allows you to write functions to perform almost any task, you can customize the way your pipeline works.

<u> Important</u>

Do not log the JSON event that CodePipeline sends to Lambda because this can result in user credentials being logged in CloudWatch Logs. The CodePipeline role uses a JSON event to pass temporary credentials to Lambda in the artifactCredentials field. For an example event, see Example JSON event.

Here are some ways Lambda functions can be used in pipelines:

- To create resources on demand in one stage of a pipeline using Amazon CloudFormation and delete them in another stage.
- To deploy application versions with zero downtime in Amazon Elastic Beanstalk with a Lambda function that swaps CNAME values.
- To deploy to Amazon ECS Docker instances.
- To back up resources before building or deploying by creating an AMI snapshot.
- To add integration with third-party products to your pipeline, such as posting messages to an IRC client.

i Note

Creating and running Lambda functions might result in charges to your Amazon account. For more information, see <u>Pricing</u>.

This topic assumes you are familiar with Amazon CodePipeline and Amazon Lambda and know how to create pipelines, functions, and the IAM policies and roles on which they depend. This topic shows you how to:

- Create a Lambda function that tests whether a webpage was deployed successfully.
- Configure the CodePipeline and Lambda execution roles and the permissions required to run the function as part of the pipeline.
- Edit a pipeline to add the Lambda function as an action.
- Test the action by manually releasing a change.

🚺 Note

When using cross-Region Lambda invoke action in CodePipeline, the status of the lambda execution using the <u>PutJobSuccessResult</u> and <u>PutJobFailureResult</u> should be sent to the Amazon Region where the Lambda function is present and not to the Region where CodePipeline exists.

This topic includes sample functions to demonstrate the flexibility of working with Lambda functions in CodePipeline:

- Basic Lambda function
 - Creating a basic Lambda function to use with CodePipeline.
 - Returning success or failure results to CodePipeline in the **Details** link for the action.
- Sample Python function that uses an Amazon CloudFormation template
 - Using JSON-encoded user parameters to pass multiple configuration values to the function (get_user_params).
 - Interacting with .zip artifacts in an artifact bucket (get_template).
 - Using a continuation token to monitor a long-running asynchronous process
 (continue_job_later). This allows the action to continue and the function to succeed even
 if it exceeds a fifteen-minute runtime (a limit in Lambda).

Each sample function includes information about the permissions you must add to the role. For information about limits in Amazon Lambda, see Limits in the Amazon Lambda Developer Guide.

<u> Important</u>

The sample code, roles, and policies included in this topic are examples only, and are provided as-is.

Topics

- Step 1: Create a pipeline
- Step 2: Create the Lambda function
- Step 3: Add the Lambda function to a pipeline in the CodePipeline console
- Step 4: Test the pipeline with the Lambda function
- Step 5: Next steps
- Example JSON event
- Additional sample functions

Step 1: Create a pipeline

In this step, you create a pipeline to which you later add the Lambda function. This is the same pipeline you created in <u>CodePipeline tutorials</u>. If that pipeline is still configured for your account and is in the same Region where you plan to create the Lambda function, you can skip this step.

To create the pipeline

- Follow the first three steps in <u>Tutorial: Create a simple pipeline (S3 bucket</u>) to create an Amazon S3 bucket, CodeDeploy resources, and a two-stage pipeline. Choose the Amazon Linux option for your instance types. You can use any name you want for the pipeline, but the steps in this topic use MyLambdaTestPipeline.
- 2. On the status page for your pipeline, in the CodeDeploy action, choose **Details**. On the deployment details page for the deployment group, choose an instance ID from the list.
- In the Amazon EC2 console, on the Details tab for the instance, copy the IP address in Public IPv4 address (for example, 192.0.2.4). You use this address as the target of the function in Amazon Lambda.

Note

The default service role policy for CodePipeline includes the Lambda permissions required to invoke the function. However, if you have modified the default service role or selected a different one, make sure the policy for the role allows the lambda:InvokeFunction and lambda:ListFunctions permissions. Otherwise, pipelines that include Lambda actions fail.

Step 2: Create the Lambda function

In this step, you create a Lambda function that makes an HTTP request and checks for a line of text on a webpage. As part of this step, you must also create an IAM policy and Lambda execution role. For more information, see Permissions Model in the *Amazon Lambda Developer Guide*.

To create the execution role

- 1. Sign in to the Amazon Web Services Management Console and open the IAM console at https://console.amazonaws.cn/iam/.
- 2. Choose **Policies**, and then choose **Create Policy**. Choose the **JSON** tab, and then paste the following policy into the field.

```
{
    "Version": "2012-10-17",
    "Statement": [
```

```
{
      "Action": [
        "logs:*"
      ],
      "Effect": "Allow",
      "Resource": "arn:aws:logs:*:*:*"
    },
    {
      "Action": [
        "codepipeline:PutJobSuccessResult",
        "codepipeline:PutJobFailureResult"
        ],
        "Effect": "Allow",
        "Resource": "*"
     }
  ]
}
```

- 3. Choose **Review policy**.
- On the Review policy page, in Name, type a name for the policy (for example, CodePipelineLambdaExecPolicy). In Description, enter Enables Lambda to execute code.

Choose Create Policy.

i Note

These are the minimum permissions required for a Lambda function to interoperate with CodePipeline and Amazon CloudWatch. If you want to expand this policy to allow functions that interact with other Amazon resources, you should modify this policy to allow the actions required by those Lambda functions.

- 5. On the policy dashboard page, choose **Roles**, and then choose **Create role**.
- 6. On the **Create role** page, choose **Amazon Web Services service**. Choose **Lambda**, and then choose **Next: Permissions**.
- On the Attach permissions policies page, select the check box next to CodePipelineLambdaExecPolicy, and then choose Next: Tags. Choose Next: Review.
- 8. On the **Review** page, in **Role name**, enter the name, and then choose **Create role**.

To create the sample Lambda function to use with CodePipeline

- 1. Sign in to the Amazon Web Services Management Console and open the Amazon Lambda console at https://console.amazonaws.cn/lambda/.
- 2. On the **Functions** page, choose **Create function**.

Note

If you see a **Welcome** page instead of the **Lambda** page, choose **Get Started Now**.

- On the Create function page, choose Author from scratch. In Function name, enter a name for your Lambda function (for example, MyLambdaFunctionForAWSCodePipeline). In Runtime, choose Node.js 20.x.
- 4. Under **Role**, select **Choose an existing role**. In **Existing role**, choose your role, and then choose **Create function**.

The detail page for your created function opens.

5. Copy the following code into the **Function code** box:

🚯 Note

The event object, under the CodePipeline.job key, contains the job details. For a full example of the JSON event CodePipeline returns to Lambda, see Example JSON event.

```
import { CodePipelineClient, PutJobSuccessResultCommand,
  PutJobFailureResultCommand } from "@aws-sdk/client-codepipeline";
import http from 'http';
import assert from 'assert';
export const handler = (event, context) => {
  const codepipeline = new CodePipelineClient();
  // Retrieve the Job ID from the Lambda action
  const jobId = event["CodePipeline.job"].id;
```

// Retrieve the value of UserParameters from the Lambda action configuration in CodePipeline, in this case a URL which will be

```
// health checked by this function.
   const url =
event["CodePipeline.job"].data.actionConfiguration.configuration.UserParameters;
  // Notify CodePipeline of a successful job
   const putJobSuccess = async function(message) {
       const command = new PutJobSuccessResultCommand({
           jobId: jobId
      });
        try {
            await codepipeline.send(command);
            context.succeed(message);
        } catch (err) {
            context.fail(err);
       }
  };
  // Notify CodePipeline of a failed job
   const putJobFailure = async function(message) {
       const command = new PutJobFailureResultCommand({
           jobId: jobId,
           failureDetails: {
               message: JSON.stringify(message),
               type: 'JobFailed',
               externalExecutionId: context.awsRequestId
           }
       });
       await codepipeline.send(command);
       context.fail(message);
  };
  // Validate the URL passed in UserParameters
  if(!url || url.indexOf('http://') === -1) {
       putJobFailure('The UserParameters field must contain a valid URL address to
test, including http:// or https://');
      return;
   }
  // Helper function to make a HTTP GET request to the page.
  // The helper will test the response and succeed or fail the job accordingly
   const getPage = function(url, callback) {
       var pageObject = {
           body: '',
           statusCode: 0,
```

```
contains: function(search) {
                return this.body.indexOf(search) > -1;
            }
        };
        http.get(url, function(response) {
            pageObject.body = '';
            pageObject.statusCode = response.statusCode;
            response.on('data', function (chunk) {
                pageObject.body += chunk;
            });
            response.on('end', function () {
                callback(pageObject);
            });
            response.resume();
        }).on('error', function(error) {
            // Fail the job if our request failed
            putJobFailure(error);
        });
    };
    getPage(url, function(returnedPage) {
        trv {
            // Check if the HTTP response has a 200 status
            assert(returnedPage.statusCode === 200);
            // Check if the page contains the text "Congratulations"
            // You can change this to check for different text, or add other tests
 as required
            assert(returnedPage.contains('Congratulations'));
            // Succeed the job
            putJobSuccess("Tests passed.");
        } catch (ex) {
            // If any of the assertions failed then fail the job
            putJobFailure(ex);
        }
    });
};
```

 Leave Handler at the default value, and leave Role at the default, CodePipelineLambdaExecRole.

- 7. In **Basic settings**, for **Timeout**, enter **20** seconds.
- 8. Choose **Save**.

Step 3: Add the Lambda function to a pipeline in the CodePipeline console

In this step, you add a new stage to your pipeline, and then add a Lambda action that calls your function to that stage.

To add a stage

- Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. On the **Welcome** page, choose the pipeline you created.
- 3. On the pipeline view page, choose Edit.
- On the Edit page, choose + Add stage to add a stage after the deployment stage with the CodeDeploy action. Enter a name for the stage (for example, LambdaStage), and choose Add stage.

Note

You can also choose to add your Lambda action to an existing stage. For demonstration purposes, we are adding the Lambda function as the only action in a stage to allow you to easily view its progress as artifacts progress through a pipeline.

5. Choose + Add action group. In Edit action, in Action name, enter a name for your Lambda action (for example, MyLambdaAction). In Provider, choose Amazon Lambda. In Function name, choose or enter the name of your Lambda function (for example, MyLambdaFunctionForAWSCodePipeline). In User parameters, specify the IP address for the Amazon EC2 instance you copied earlier (for example, http://192.0.2.4), and then choose Done.

🚯 Note

This topic uses an IP address, but in a real-world scenario, you could provide your registered website name instead (for example, **http://www.example.com**). For more

information about event data and handlers in Amazon Lambda, see <u>Programming</u> Model in the Amazon Lambda Developer Guide.

6. On the **Edit action** page, choose **Save**.

Step 4: Test the pipeline with the Lambda function

To test the function, release the most recent change through the pipeline.

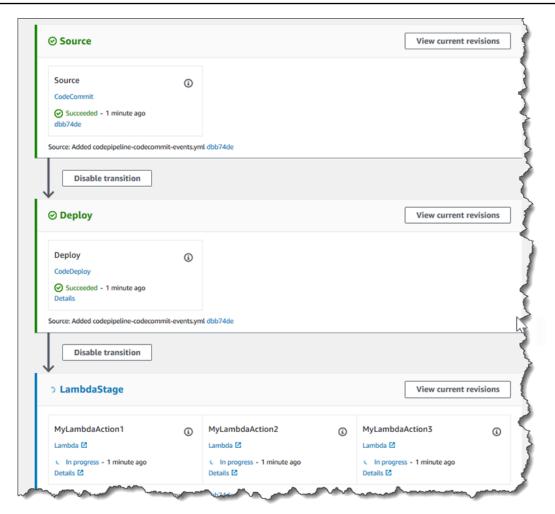
To use the console to run the most recent version of an artifact through a pipeline

- 1. On the pipeline details page, choose **Release change**. This runs the most recent revision available in each source location specified in a source action through the pipeline.
- 2. When the Lambda action is complete, choose the **Details** link to view the log stream for the function in Amazon CloudWatch, including the billed duration of the event. If the function failed, the CloudWatch log provides information about the cause.

Step 5: Next steps

Now that you've successfully created a Lambda function and added it as an action in a pipeline, you can try the following:

- Add more Lambda actions to your stage to check other webpages.
- Modify the Lambda function to check for a different text string.
- Explore Lambda functions and create and add your own Lambda functions to pipelines.



After you have finished experimenting with the Lambda function, consider removing it from your pipeline, deleting it from Amazon Lambda, and deleting the role from IAM to avoid possible charges. For more information, see <u>Edit a pipeline in CodePipeline</u>, <u>Delete a pipeline in</u> CodePipeline, and Deleting Roles or Instance Profiles.

Example JSON event

The following example shows a sample JSON event sent to Lambda by CodePipeline. The structure of this event is similar to the response to the <u>GetJobDetails API</u>, but without the actionTypeId and pipelineContext data types. Two action configuration details, FunctionName and UserParameters, are included in both the JSON event and the response to the GetJobDetails API. The values in *red italic text* are examples or explanations, not real values.

```
"CodePipeline.job": {
```

{

User Guide

```
"id": "11111111-abcd-1111-abcd-111111abcdef",
       "accountId": "111111111111",
       "data": {
           "actionConfiguration": {
               "configuration": {
                   "FunctionName": "MyLambdaFunctionForAWSCodePipeline",
                   "UserParameters": "some-input-such-as-a-URL"
               }
           },
           "inputArtifacts": [
               {
                   "location": {
                       "s3Location": {
                           "bucketName": "the name of the bucket configured as the
pipeline artifact store in Amazon S3, for example codepipeline-us-east-2-1234567890",
                           "objectKey": "the name of the application, for example
CodePipelineDemoApplication.zip"
                       },
                       "type": "S3"
                   },
                   "revision": null,
                   "name": "ArtifactName"
               }
           ],
           "outputArtifacts": [],
           "artifactCredentials": {
               "secretAccessKey": "wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY",
               "sessionToken": "MIICiTCCAfICCQD6m7oRw0uX0jANBqkqhkiG9w
ØBAQUFADCBiDELMAkGA1UEBhMCVVMxCzAJBgNVBAgTA1dBMRAwDgYDVQQHEwdTZ
WF0dGx1MQ8wDQYDVQQKEwZBbWF6b24xFDASBqNVBAsTC01BTSBDb25zb2x1MRIw
EAYDVQQDEwlUZXN0Q2lsYWMxHzAdBgkqhkiG9w0BCQEWEG5vb25lQGFtYXpvbi5
jb20wHhcNMTEwNDI1MjA0NTIxWhcNMTIwNDI0MjA0NTIxWjCBiDELMAkGA1UEBh
MCVVMxCzAJBqNVBAqTA1dBMRAwDqYDVQQHEwdTZWF0dGx1MQ8wDQYDVQQKEwZBb
WF6b24xFDASBgNVBAsTC01BTSBDb25zb2x1MRIwEAYDVQQDEw1UZXN0Q21sYWMx
HzAdBqkqhkiG9w0BCQEWEG5vb25lQGFtYXpvbi5jb20wqZ8wDQYJKoZIhvcNAQE
BBQADgY0AMIGJAoGBAMaK0dn+a4GmWIWJ21uUSfwfEvySWtC2XADZ4nB+BLYgVI
k60CpiwsZ3G93vUEI03IyNoH/f0wYK8m9TrDHudUZq3qX4waLG5M43q7Wqc/MbQ
ITx0USQv7c7ugFFDzQGBzZswY6786m86gpEIbb30hjZnzcvQAaRHhdlQWIMm2nr
AqMBAAEwDQYJKoZIhvcNAQEFBQADqYEAtCu4nUhVVxYUntneD9+h8Mq9q6q+auN
KyExzyLwaxlAoo7TJHidbtS4J5iNmZqXL0FkbFFBjvSfpJIlJ00zbhNYS5f6Guo
EDmFJl0ZxBHjJnyp3780D8uTs7fLvjx79LjSTbNYiytVbZPQUQ5Yaxu2jXnimvw
3rrszlaEXAMPLE=",
               "accessKeyId": "AKIAIOSFODNN7EXAMPLE"
           },
```

```
"continuationToken": "A continuation token if continuing job",
    "encryptionKey": {
        "id": "arn:aws:kms:us-
west-2:111122223333:key/1234abcd-12ab-34cd-56ef-1234567890ab",
        "type": "KMS"
        }
     }
}
```

Additional sample functions

The following sample Lambda functions demonstrate additional functionality you can use for your pipelines in CodePipeline. To use these functions, you might have to modify the policy for the Lambda execution role, as noted in the introduction for each sample.

Topics

• Sample Python function that uses an Amazon CloudFormation template

Sample Python function that uses an Amazon CloudFormation template

The following sample shows a function that creates or updates a stack based on a supplied Amazon CloudFormation template. The template creates an Amazon S3 bucket. It is for demonstration purposes only, to minimize costs. Ideally, you should delete the stack before you upload anything to the bucket. If you upload files to the bucket, you cannot delete the bucket when you delete the stack. You must manually delete everything in the bucket before you can delete the bucket itself.

This Python sample assumes you have a pipeline that uses an Amazon S3 bucket as a source action, or that you have access to a versioned Amazon S3 bucket you can use with the pipeline. You create the Amazon CloudFormation template, compress it, and upload it to that bucket as a .zip file. You must then add a source action to your pipeline that retrieves this .zip file from the bucket.

🚯 Note

When Amazon S3 is the source provider for your pipeline, you may zip your source file or files into a single .zip and upload the .zip to your source bucket. You may also upload a single unzipped file; however, downstream actions that expect a .zip file will fail.

This sample demonstrates:

- The use of JSON-encoded user parameters to pass multiple configuration values to the function (get_user_params).
- The interaction with .zip artifacts in an artifact bucket (get_template).
- The use of a continuation token to monitor a long-running asynchronous process (continue_job_later). This allows the action to continue and the function to succeed even if it exceeds a fifteen-minute runtime (a limit in Lambda).

To use this sample Lambda function, the policy for the Lambda execution role must have Allow permissions in Amazon CloudFormation, Amazon S3, and CodePipeline, as shown in this sample policy:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                 "logs:*"
            ],
            "Effect": "Allow",
            "Resource": "arn:aws:logs:*:*:*"
        },
        {
            "Action": [
                 "codepipeline:PutJobSuccessResult",
                 "codepipeline:PutJobFailureResult"
            ],
            "Effect": "Allow",
            "Resource": "*"
        },
        {
            "Action": [
                 "cloudformation:DescribeStacks",
                 "cloudformation:CreateStack",
                 "cloudformation:UpdateStack"
            ],
            "Effect": "Allow",
            "Resource": "*"
        },
        {
```

```
"Action": [
"s3:*"
],
"Effect": "Allow",
"Resource": "*"
}
]
}
```

To create the Amazon CloudFormation template, open any plain-text editor and copy and paste the following code:

```
{
  "AWSTemplateFormatVersion" : "2010-09-09",
  "Description" : "CloudFormation template which creates an S3 bucket",
  "Resources" : {
    "MySampleBucket" : {
      "Type" : "AWS::S3::Bucket",
      "Properties" : {
      }
    }
 },
  "Outputs" : {
    "BucketName" : {
      "Value" : { "Ref" : "MySampleBucket" },
      "Description" : "The name of the S3 bucket"
    }
  }
}
```

Save this as a JSON file with the name template.json in a directory named templatepackage. Create a compressed (.zip) file of this directory and file named templatepackage.zip, and upload the compressed file to a versioned Amazon S3 bucket. If you already have a bucket configured for your pipeline, you can use it. Next, edit your pipeline to add a source action that retrieves the .zip file. Name the output for this action *MyTemplate*. For more information, see Edit a pipeline in CodePipeline.

🚯 Note

The sample Lambda function expects these file names and compressed structure. However, you can substitute your own Amazon CloudFormation template for this sample. If you use

your own template, make sure you modify the policy for the Lambda execution role to allow any additional functionality required by your Amazon CloudFormation template.

To add the following code as a function in Lambda

- 1. Open the Lambda console and choose **Create function**.
- 2. On the **Create function** page, choose **Author from scratch**. In **Function name**, enter a name for your Lambda function.
- 3. In **Runtime**, choose **Python 2.7**.
- 4. Under **Choose or create an execution role**, select **Use an existing role**. In **Existing role**, choose your role, and then choose **Create function**.

The detail page for your created function opens.

5. Copy the following code into the **Function code** box:

```
from __future__ import print_function
from boto3.session import Session
import json
import urllib
import boto3
import zipfile
import tempfile
import botocore
import traceback
print('Loading function')
cf = boto3.client('cloudformation')
code_pipeline = boto3.client('codepipeline')
def find_artifact(artifacts, name):
    """Finds the artifact 'name' among the 'artifacts'
   Args:
        artifacts: The list of artifacts available to the function
        name: The artifact we wish to use
    Returns:
        The artifact dictionary found
    Raises:
```

```
Exception: If no matching artifact is found
    .....
   for artifact in artifacts:
        if artifact['name'] == name:
            return artifact
   raise Exception('Input artifact named "{0}" not found in event'.format(name))
def get_template(s3, artifact, file_in_zip):
    """Gets the template artifact
    Downloads the artifact from the S3 artifact store to a temporary file
   then extracts the zip and returns the file containing the CloudFormation
    template.
   Args:
        artifact: The artifact to download
        file_in_zip: The path to the file within the zip containing the template
    Returns:
        The CloudFormation template as a string
    Raises:
        Exception: Any exception thrown while downloading the artifact or unzipping
it
    .....
   tmp_file = tempfile.NamedTemporaryFile()
    bucket = artifact['location']['s3Location']['bucketName']
    key = artifact['location']['s3Location']['objectKey']
   with tempfile.NamedTemporaryFile() as tmp_file:
        s3.download_file(bucket, key, tmp_file.name)
       with zipfile.ZipFile(tmp_file.name, 'r') as zip:
            return zip.read(file_in_zip)
def update_stack(stack, template):
    """Start a CloudFormation stack update
   Args:
        stack: The stack to update
        template: The template to apply
```

```
Returns:
        True if an update was started, false if there were no changes
        to the template since the last update.
    Raises:
        Exception: Any exception besides "No updates are to be performed."
    .....
   try:
        cf.update_stack(StackName=stack, TemplateBody=template)
        return True
    except botocore.exceptions.ClientError as e:
        if e.response['Error']['Message'] == 'No updates are to be performed.':
            return False
        else:
            raise Exception('Error updating CloudFormation stack
 "{0}"'.format(stack), e)
def stack_exists(stack):
    """Check if a stack exists or not
   Args:
        stack: The stack to check
    Returns:
        True or False depending on whether the stack exists
    Raises:
        Any exceptions raised .describe_stacks() besides that
        the stack doesn't exist.
    .....
    try:
       cf.describe_stacks(StackName=stack)
       return True
    except botocore.exceptions.ClientError as e:
        if "does not exist" in e.response['Error']['Message']:
            return False
        else:
            raise e
def create_stack(stack, template):
    """Starts a new CloudFormation stack creation
```

Args: stack: The stack to be created template: The template for the stack to be created with Throws: Exception: Any exception thrown by .create_stack() cf.create_stack(StackName=stack, TemplateBody=template) def get_stack_status(stack): """Get the status of an existing CloudFormation stack Args: stack: The name of the stack to check Returns: The CloudFormation status string of the stack such as CREATE_COMPLETE Raises: Exception: Any exception thrown by .describe_stacks() stack_description = cf.describe_stacks(StackName=stack) return stack_description['Stacks'][0]['StackStatus'] def put_job_success(job, message): """Notify CodePipeline of a successful job Args: job: The CodePipeline job ID message: A message to be logged relating to the job status Raises: Exception: Any exception thrown by .put_job_success_result() print('Putting job success') print(message) code_pipeline.put_job_success_result(jobId=job) def put_job_failure(job, message): """Notify CodePipeline of a failed job

```
Args:
        job: The CodePipeline job ID
        message: A message to be logged relating to the job status
    Raises:
        Exception: Any exception thrown by .put_job_failure_result()
    .....
    print('Putting job failure')
    print(message)
    code_pipeline.put_job_failure_result(jobId=job, failureDetails={'message':
message, 'type': 'JobFailed'})
def continue_job_later(job, message):
    """Notify CodePipeline of a continuing job
   This will cause CodePipeline to invoke the function again with the
    supplied continuation token.
   Args:
        job: The JobID
        message: A message to be logged relating to the job status
        continuation_token: The continuation token
    Raises:
        Exception: Any exception thrown by .put_job_success_result()
    .....
   # Use the continuation token to keep track of any job execution state
    # This data will be available when a new job is scheduled to continue the
 current execution
   continuation_token = json.dumps({'previous_job_id': job})
    print('Putting job continuation')
    print(message)
    code_pipeline.put_job_success_result(jobId=job,
continuationToken=continuation_token)
def start_update_or_create(job_id, stack, template):
    """Starts the stack update or create process
   If the stack exists then update, otherwise create.
```

```
Args:
        job_id: The ID of the CodePipeline job
        stack: The stack to create or update
        template: The template to create/update the stack with
    .....
   if stack_exists(stack):
        status = get_stack_status(stack)
        if status not in ['CREATE_COMPLETE', 'ROLLBACK_COMPLETE',
 'UPDATE_COMPLETE']:
            # If the CloudFormation stack is not in a state where
            # it can be updated again then fail the job right away.
            put_job_failure(job_id, 'Stack cannot be updated when status is: ' +
 status)
            return
       were_updates = update_stack(stack, template)
       if were_updates:
            # If there were updates then continue the job so it can monitor
            # the progress of the update.
            continue_job_later(job_id, 'Stack update started')
        else:
            # If there were no updates then succeed the job immediately
            put_job_success(job_id, 'There were no stack updates')
    else:
        # If the stack doesn't already exist then create it instead
        # of updating it.
        create_stack(stack, template)
        # Continue the job so the pipeline will wait for the CloudFormation
        # stack to be created.
        continue_job_later(job_id, 'Stack create started')
def check_stack_update_status(job_id, stack):
    """Monitor an already-running CloudFormation update/create
    Succeeds, fails or continues the job depending on the stack status.
   Args:
        job_id: The CodePipeline job ID
        stack: The stack to monitor
    .....
```

```
status = get_stack_status(stack)
    if status in ['UPDATE_COMPLETE', 'CREATE_COMPLETE']:
        # If the update/create finished successfully then
        # succeed the job and don't continue.
        put_job_success(job_id, 'Stack update complete')
    elif status in ['UPDATE_IN_PROGRESS', 'UPDATE_ROLLBACK_IN_PROGRESS',
    'UPDATE_ROLLBACK_COMPLETE_CLEANUP_IN_PROGRESS', 'CREATE_IN_PROGRESS',
    'ROLLBACK_IN_PROGRESS', 'UPDATE_COMPLETE_CLEANUP_IN_PROGRESS']:
        # If the job isn't finished yet then continue it
        continue_job_later(job_id, 'Stack update still in progress')
    else:
        # If the Stack is a state which isn't "in progress" or "complete"
        # then the stack update/create has failed so end the job with
        # a failed result.
        put_job_failure(job_id, 'Update failed: ' + status)
def get_user_params(job_data):
    """Decodes the JSON user parameters and validates the required properties.
   Args:
        job_data: The job data structure containing the UserParameters string which
 should be a valid JSON structure
    Returns:
        The JSON parameters decoded as a dictionary.
    Raises:
        Exception: The JSON can't be decoded or a property is missing.
    .....
   try:
        # Get the user parameters which contain the stack, artifact and file
 settings
        user_parameters = job_data['actionConfiguration']['configuration']
['UserParameters']
        decoded_parameters = json.loads(user_parameters)
    except Exception as e:
        # We're expecting the user parameters to be encoded as JSON
        # so we can pass multiple values. If the JSON can't be decoded
        # then fail the job with a helpful message.
        raise Exception('UserParameters could not be decoded as JSON')
```

if 'stack' not in decoded_parameters: # Validate that the stack is provided, otherwise fail the job # with a helpful message. raise Exception('Your UserParameters JSON must include the stack name') if 'artifact' not in decoded_parameters: # Validate that the artifact name is provided, otherwise fail the job # with a helpful message. raise Exception('Your UserParameters JSON must include the artifact name') if 'file' not in decoded_parameters: # Validate that the template file is provided, otherwise fail the job # with a helpful message. raise Exception('Your UserParameters JSON must include the template file name') return decoded_parameters def setup_s3_client(job_data): """Creates an S3 client Uses the credentials passed in the event by CodePipeline. These credentials can be used to access the artifact bucket. Args: job_data: The job data structure Returns: An S3 client with the appropriate credentials key_id = job_data['artifactCredentials']['accessKeyId'] key_secret = job_data['artifactCredentials']['secretAccessKey'] session_token = job_data['artifactCredentials']['sessionToken'] session = Session(aws_access_key_id=key_id, aws_secret_access_key=key_secret, aws_session_token=session_token) return session.client('s3', config=botocore.client.Config(signature_version='s3v4')) def lambda_handler(event, context): """The Lambda function handler

```
If a continuing job then checks the CloudFormation stack status
and updates the job accordingly.
If a new job then kick of an update or creation of the target
CloudFormation stack.
Args:
    event: The event passed by Lambda
    context: The context passed by Lambda
.....
try:
    # Extract the Job ID
    job_id = event['CodePipeline.job']['id']
    # Extract the Job Data
    job_data = event['CodePipeline.job']['data']
    # Extract the params
    params = get_user_params(job_data)
    # Get the list of artifacts passed to the function
    artifacts = job_data['inputArtifacts']
    stack = params['stack']
    artifact = params['artifact']
    template_file = params['file']
    if 'continuationToken' in job_data:
        # If we're continuing then the create/update has already been triggered
        # we just need to check if it has finished.
        check_stack_update_status(job_id, stack)
    else:
        # Get the artifact details
        artifact_data = find_artifact(artifacts, artifact)
        # Get S3 client to access artifact with
        s3 = setup_s3_client(job_data)
        # Get the JSON template file out of the artifact
        template = get_template(s3, artifact_data, template_file)
        # Kick off a stack update or create
        start_update_or_create(job_id, stack, template)
except Exception as e:
```

```
# If any other exceptions which we didn't expect are raised
# then fail the job and log the exception message.
print('Function failed due to exception.')
print(e)
traceback.print_exc()
put_job_failure(job_id, 'Function exception: ' + str(e))
print('Function complete.')
return "Complete."
```

- Leave Handler at the default value, and leave Role at the name you selected or created earlier, CodePipelineLambdaExecRole.
- 7. In **Basic settings**, for **Timeout**, replace the default of 3 seconds with **20**.
- 8. Choose **Save**.
- 9. From the CodePipeline console, edit the pipeline to add the function as an action in a stage in your pipeline. Choose **Edit** for the pipeline stage you want to change, and choose **Add action group**. On the **Edit action** page, in **Action name**, enter a name for your action. In **Action provider**, choose **Lambda**.

Under Input artifacts, choose MyTemplate. In UserParameters, you must provide a JSON string with three parameters:

- Stack name
- Amazon CloudFormation template name and path to the file
- Input artifact

Use curly brackets ({ }) and separate the parameters with commas. For example, to create a stack named *MyTestStack*, for a pipeline with the input artifact *MyTemplate*, in **UserParameters**, enter: {"stack":"*MyTestStack*","file":"template-package/ template.json","artifact":"*MyTemplate*"}.

i Note

Even though you have specified the input artifact in **UserParameters**, you must also specify this input artifact for the action in **Input artifacts**.

10. Save your changes to the pipeline, and then manually release a change to test the action and Lambda function.

User Guide

Add a manual approval action to a stage

In Amazon CodePipeline, you can add an approval action to a stage in a pipeline at the point where you want the pipeline execution to stop so that someone with the required Amazon Identity and Access Management permissions can approve or reject the action.

If the action is approved, the pipeline execution resumes. If the action is rejected—or if no one approves or rejects the action within seven days of the pipeline reaching the action and stopping—the result is the same as an action failing, and the pipeline execution does not continue.

You might use manual approvals for these reasons:

- You want someone to perform a code review or change management review before a revision is allowed into the next stage of a pipeline.
- You want someone to perform manual quality assurance testing on the latest version of an application, or to confirm the integrity of a build artifact, before it is released.
- You want someone to review new or updated text before it is published to a company website.

Configuration options for manual approval actions in CodePipeline

CodePipeline provides three configuration options you can use to tell approvers about the approval action.

Publish Approval Notifications You can configure an approval action to publish a message to an Amazon Simple Notification Service topic when the pipeline stops at the action. Amazon SNS delivers the message to every endpoint subscribed to the topic. You must use a topic created in the same Amazon Region as the pipeline that will include the approval action. When you create a topic, we recommend you give it a name that will identify its purpose, in formats such as MyFirstPipeline-us-east-2-approval.

When you publish approval notifications to Amazon SNS topics, you can choose from formats such as email or SMS recipients, SQS queues, HTTP/HTTPS endpoints, or Amazon Lambda functions you invoke using Amazon SNS. For information about Amazon SNS topic notifications, see the following topics:

- What Is Amazon Simple Notification Service?
- <u>Create a Topic in Amazon SNS</u>
- Sending Amazon SNS Messages to Amazon SQS Queues

- Subscribing a Queue to an Amazon SNS Topic
- Sending Amazon SNS Messages to HTTP/HTTPS Endpoints
- Invoking Lambda Functions Using Amazon SNS Notifications

For the structure of the JSON data generated for an approval action notification, see <u>JSON data</u> format for manual approval notifications in CodePipeline.

Specify a URL for Review As part of the configuration of the approval action, you can specify a URL to be reviewed. The URL might be a link to a web application you want approvers to test or a page with more information about your approval request. The URL is included in the notification that is published to the Amazon SNS topic. Approvers can use the console or CLI to view it.

Enter Comments for Approvers When you create an approval action, you can also add comments that are displayed to those who receive the notifications or those who view the action in the console or CLI response.

No Configuration Options You can also choose not to configure any of these three options. You might not need them if, for example, you can notify someone directly that the action is ready for their review, or you simply want the pipeline to stop until you decide to approve the action yourself.

Setup and workflow overview for approval actions in CodePipeline

The following is an overview for setting up and using manual approvals.

- 1. You grant the IAM permissions required for approving or rejecting approval actions to one or more IAM roles in your organization.
- 2. (Optional) If you are using Amazon SNS notifications, you ensure that the service role you use in your CodePipeline operations has permission to access Amazon SNS resources.
- 3. (Optional) If you are using Amazon SNS notifications, you create an Amazon SNS topic and add one or more subscribers or endpoints to it.
- 4. When you use the Amazon CLI to create the pipeline or after you have used the CLI or console to create the pipeline, you add an approval action to a stage in the pipeline.

If you are using notifications, you include the Amazon Resource Name (ARN) of the Amazon SNS topic in the configuration of the action. (An ARN is a unique identifier for an Amazon resource. ARNs for Amazon SNS topics are structured like *arn:aws:sns:us-*

east-2:80398EXAMPLE:MyApprovalTopic. For more information, see <u>Amazon Resource</u> <u>Names (ARNs) and Amazon Web Services service namespaces</u> in the Amazon Web Services *General Reference*.)

- 5. The pipeline stops when it reaches the approval action. If an Amazon SNS topic ARN was included in the configuration of the action, a notification is published to the Amazon SNS topic, and a message is delivered to any subscribers to the topic or subscribed endpoints, with a link to review the approval action in the console.
- 6. An approver examines the target URL and reviews comments, if any.
- 7. Using the console, CLI, or SDK, the approver provides a summary comment and submits a response:
 - Approved: The pipeline execution resumes.
 - Rejected: The stage status is changed to "Failed" and the pipeline execution does not resume.

If no response is submitted within seven days, the action is marked as "Failed."

Grant approval permissions to an IAM user in CodePipeline

Before IAM users in your organization can approve or reject approval actions, they must be granted permissions to access pipelines and to update the status of approval actions. You can grant permission to access all pipelines and approval actions in your account by attaching the AWSCodePipelineApproverAccess managed policy to an IAM user, role, or group; or you can to grant limited permissions by specifying the individual resources that can be accessed by an IAM user, role, or group.

🚯 Note

The permissions described in this topic grant very limited access. To enable a user, role, or group to do more than approve or reject approval actions, you can attach other managed policies. For information about the managed policies available for CodePipeline, see <u>Amazon managed policies for Amazon CodePipeline</u>.

Grant approval permission to all pipelines and approval actions

For users who need to perform approval actions in CodePipeline, use the AWSCodePipelineApproverAccess managed policy.

To provide access, add permissions to your users, groups, or roles:

• Users managed in IAM through an identity provider:

Create a role for identity federation. Follow the instructions in <u>Create a role for a third-party</u> identity provider (federation) in the *IAM User Guide*.

- IAM users:
 - Create a role that your user can assume. Follow the instructions in <u>Create a role for an IAM user</u> in the *IAM User Guide*.
 - (Not recommended) Attach a policy directly to a user or add a user to a user group. Follow the instructions in Adding permissions to a user (console) in the *IAM User Guide*.

Specify approval permission for specific pipelines and approval actions

For users who need to perform approval actions in CodePipeline, use the following custom policy. In the policy below, specify the individual resources a user can access. For example, the following policy grants users the authority to approve or reject only the action named MyApprovalAction in the MyFirstPipeline pipeline in the US East (Ohio) Region (us-east-2):

Note

The codepipeline:ListPipelines permission is required only if IAM users need to access the CodePipeline dashboard to view this list of pipelines. If console access is not required, you can omit codepipeline:ListPipelines.

To use the JSON policy editor to create a policy

- 1. Sign in to the Amazon Web Services Management Console and open the IAM console at https://console.amazonaws.cn/iam/.
- 2. In the navigation pane on the left, choose **Policies**.

If this is your first time choosing **Policies**, the **Welcome to Managed Policies** page appears. Choose **Get Started**.

- 3. At the top of the page, choose **Create policy**.
- 4. In the **Policy editor** section, choose the **JSON** option.
- 5. Enter the following JSON policy document:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "codepipeline:ListPipelines"
            ],
            "Resource": [
                "*"
            ]
        },
        {
            "Effect": "Allow",
            "Action": [
                "codepipeline:GetPipeline",
                "codepipeline:GetPipelineState",
                "codepipeline:GetPipelineExecution"
            ],
            "Resource": "arn:aws:codepipeline:us-
east-2:80398EXAMPLE:MyFirstPipeline"
        },
        {
            "Effect": "Allow",
            "Action": [
                "codepipeline:PutApprovalResult"
            ],
            "Resource": "arn:aws:codepipeline:us-
east-2:80398EXAMPLE:MyFirstPipeline/MyApprovalStage/MyApprovalAction"
        }
    ]
}
```

6. Choose Next.

1 Note

You can switch between the **Visual** and **JSON** editor options anytime. However, if you make changes or choose **Next** in the **Visual** editor, IAM might restructure your policy to optimize it for the visual editor. For more information, see <u>Policy restructuring</u> in the *IAM User Guide*.

- 7. On the **Review and create** page, enter a **Policy name** and a **Description** (optional) for the policy that you are creating. Review **Permissions defined in this policy** to see the permissions that are granted by your policy.
- 8. Choose Create policy to save your new policy.

Grant Amazon SNS permissions to a CodePipeline service role

If you plan to use Amazon SNS to publish notifications to topics when approval actions require review, the service role you use in your CodePipeline operations must be granted permission to access the Amazon SNS resources. You can use the IAM console to add this permission to your service role.

In the policy below, specify the policy for publishing with SNS. For the following policy, you can name it SNSPublish. Use the following policy by attaching it to your service role.

<u> Important</u>

Make sure you are signed in to the Amazon Web Services Management Console with the same account information you used in <u>Getting started with CodePipeline</u>.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "sns:Publish",
            "Resource": "*"
        }
    ]
}
```

To use the JSON policy editor to create a policy

- 1. Sign in to the Amazon Web Services Management Console and open the IAM console at https://console.amazonaws.cn/iam/.
- 2. In the navigation pane on the left, choose **Policies**.

If this is your first time choosing **Policies**, the **Welcome to Managed Policies** page appears. Choose **Get Started**.

- 3. At the top of the page, choose **Create policy**.
- 4. In the **Policy editor** section, choose the **JSON** option.
- 5. Enter or paste a JSON policy document. For details about the IAM policy language, see <u>IAM</u> <u>JSON policy reference</u>.
- Resolve any security warnings, errors, or general warnings generated during <u>policy validation</u>, and then choose **Next**.

Note

You can switch between the **Visual** and **JSON** editor options anytime. However, if you make changes or choose **Next** in the **Visual** editor, IAM might restructure your policy to optimize it for the visual editor. For more information, see <u>Policy restructuring</u> in the *IAM User Guide*.

7. (Optional) When you create or edit a policy in the Amazon Web Services Management Console, you can generate a JSON or YAML policy template that you can use in Amazon CloudFormation templates.

To do this, in the **Policy editor** choose **Actions**, and then choose **Generate CloudFormation template**. To learn more about Amazon CloudFormation, see <u>Amazon Identity and Access</u> <u>Management resource type reference</u> in the *Amazon CloudFormation User Guide*.

- 8. When you are finished adding permissions to the policy, choose Next.
- 9. On the **Review and create** page, enter a **Policy name** and a **Description** (optional) for the policy that you are creating. Review **Permissions defined in this policy** to see the permissions that are granted by your policy.
- (Optional) Add metadata to the policy by attaching tags as key-value pairs. For more information about using tags in IAM, see <u>Tags for Amazon Identity and Access Management</u> <u>resources</u> in the *IAM User Guide*.
- 11. Choose Create policy to save your new policy.

Add a manual approval action to a pipeline in CodePipeline

You can add an approval action to a stage in a CodePipeline pipeline at the point where you want the pipeline to stop so someone can manually approve or reject the action.

🚯 Note

Approval actions can't be added to Source stages. Source stages can contain only source actions.

If you want to use Amazon SNS to send notifications when an approval action is ready for review, you must first complete the following prerequisites:

- Grant permission to your CodePipeline service role to access Amazon SNS resources. For information, see Grant Amazon SNS permissions to a CodePipeline service role.
- Grant permission to one or more IAM identities in your organization to update the status of an approval action. For information, see <u>Grant approval permissions to an IAM user in CodePipeline</u>.

In this example, you create a new approval stage and add a manual approval action to the stage. You can also add a manual approval action to an existing stage that contains other actions.

Add a manual approval action to a CodePipeline pipeline (console)

You can use the CodePipeline console to add an approval action to an existing CodePipeline pipeline. You must use the Amazon CLI if you want to add approval actions when you create a new pipeline.

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. In **Name**, choose the pipeline.
- 3. On the pipeline details page, choose **Edit**.
- 4. If you want to add an approval action to a new stage, choose **+ Add stage** at the point in the pipeline where you want to add an approval request, and enter a name for the stage. On the **Add stage** page, in **Stage name**, enter your new stage name. For example, add a new stage and name it Manual_Approval.

If you want to add an approval action to an existing stage, choose **Edit stage**.

5. In the stage where you want to add the approval action, choose + Add action group.

- 6. On the **Edit action** page, do the following:
 - 1. In **Action name**, enter a name to identify the action.
 - 2. In Action provider, under Approval, choose Manual approval.
 - 3. (Optional) In **SNS topic ARN**, choose the name of the topic to be used to send notifications for the approval action.
 - 4. (Optional) In **URL for review**, enter the URL of the page or application you want the approver to examine. Approvers can access this URL through a link included in the console view of the pipeline.
 - 5. (Optional) In Comments, enter any other information you want to share with the reviewer.
 - 6. Choose **Save**.

Add a manual approval action to a CodePipeline pipeline (CLI)

You can use the CLI to add an approval action to an existing pipeline or when you create a pipeline. You do this by including an approval action, with the Manual approval type, in a stage you are creating or editing.

For more information about creating and editing pipelines, see <u>Create a pipeline, stages, and</u> actions and Edit a pipeline in CodePipeline.

To add a stage to a pipeline that includes only an approval action, you would include something similar to the following example when you create or update the pipeline.

🚯 Note

The configuration section is optional. This is just a portion, not the entire structure, of the file. For more information, see <u>CodePipeline pipeline structure reference</u>.

```
{
    "name": "MyApprovalStage",
    "actions": [
        {
            "name": "MyApprovalAction",
            "actionTypeId": {
                "category": "Approval",
                "owner": "AWS",
                "
```

```
"version": "1",
    "provider": "Manual"
    },
    "inputArtifacts": [],
    "outputArtifacts": [],
    "configuration": {
        "NotificationArn": "arn:aws:sns:us-
east-2:80398EXAMPLE:MyApprovalTopic",
        "ExternalEntityLink": "http://example.com",
        "ExternalEntityLink": "http://example.com",
        "CustomData": "The latest changes include feedback from Bob."},
        "runOrder": 1
    }
  ]
}
```

If the approval action is in a stage with other actions, the section of your JSON file that contains the stage might look similar instead to the following example.

🚯 Note

The configuration section is optional. This is just a portion, not the entire structure, of the file. For more information, see <u>CodePipeline pipeline structure reference</u>.

```
1
{
    "name": "Production",
    "actions": [
        {
            "inputArtifacts": [],
            "name": "MyApprovalAction",
            "actionTypeId": {
                "category": "Approval",
                "owner": "AWS",
                "version": "1",
                "provider": "Manual"
            },
            "outputArtifacts": [],
            "configuration": {
                "NotificationArn": "arn:aws:sns:us-
east-2:80398EXAMPLE:MyApprovalTopic",
                "ExternalEntityLink": "http://example.com",
```

}

```
"CustomData": "The latest changes include feedback from Bob."
        },
        "runOrder": 1
    },
    {
        "inputArtifacts": [
            {
                "name": "MyApp"
            }
        ],
        "name": "MyDeploymentAction",
        "actionTypeId": {
            "category": "Deploy",
            "owner": "AWS",
            "version": "1",
            "provider": "CodeDeploy"
        },
        "outputArtifacts": [],
        "configuration": {
            "ApplicationName": "MyDemoApplication",
            "DeploymentGroupName": "MyProductionFleet"
        },
        "runOrder": 2
    }
]
```

Approve or reject an approval action in CodePipeline

When a pipeline includes an approval action, the pipeline execution stops at the point where the action has been added. The pipeline won't resume unless someone manually approves the action. If an approver rejects the action, or if no approval response is received within seven days of the pipeline stopping for the approval action, the pipeline status becomes "Failed."

If the person who added the approval action to the pipeline configured notifications, you might receive an email with the pipeline information and status for approval.

Approve or reject an approval action (console)

If you receive a notification that includes a direct link to an approval action, choose the **Approve or reject** link, sign in to the console, and then continue with step 7 here. Otherwise, follow all of these steps.

- 1. Open the CodePipeline console at https://console.amazonaws.cn/codepipeline/.
- 2. On the **All Pipelines** page, choose the name of the pipeline.
- 3. Locate the stage with the approval action. Choose **Review**.

The **Review** dialog box displays. The **Details** tab shows the review content and comments.

Review Action name: Approval Status: Waiting for approval
Details Revisions
Trigger
StartPipelineExecution - assumed-role/
Comments about this action
Comments for reviewer/approver
URL for review
https://review-url 🔼
Decision
• Approve Approving will resume the pipeline execution.
 Reject Rejecting will stop the pipeline execution with a failed status.
Comments - optional Preview markdown Learn more
Comments from reviewer/approver
Cancel Submit

The **Revisions** tab shows the source revisions for the execution.

Review Action name: Approval Status: Waiting for approval		×
Details Revisions		
Source		
Revision <u>2de8579a</u> 2 : Add files via upload		
	Cancel Su	bmit

- 4. On the **Details** tab, view the comments and URL, if any. The message also displays the URL of content for you to review, if one was included.
- 5. If a URL was provided, choose the **URL for review** link in the action to open the target webpage, and then review the content.
- 6. In the **Review** window, enter review comments, such as why you are approving or rejecting the action, and then choose **Approve** or **Reject**.
- 7. Choose **Submit**.

Approve or reject an approval request (CLI)

To use the CLI to respond to an approval action, you must first use the **get-pipeline-state** command to retrieve the token associated with latest execution of the approval action.

 At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the <u>get-pipeline-state</u> command on the pipeline that contains the approval action. For example, for a pipeline named *MyFirstPipeline*, enter the following:

```
aws codepipeline get-pipeline-state --name MyFirstPipeline
```

 In the response to the command, locate the token value, which appears in latestExecution in the actionStates section for the approval action, as shown here:

```
{
    "created": 1467929497.204,
    "pipelineName": "MyFirstPipeline",
    "pipelineVersion": 1,
    "stageStates": [
        {
            "actionStates": [
                {
                    "actionName": "MyApprovalAction",
                    "currentRevision": {
                         "created": 1467929497.204,
                        "revisionChangeId": "CEM7d6Tp7zfelUSLCPPwo234xEXAMPLE",
                         "revisionId": "HYGp7zmwbCPPwo23xCMdTeqIlEXAMPLE"
                    },
                    "latestExecution": {
                         "lastUpdatedBy": "identity",
                         "summary": "The new design needs to be reviewed before
release.",
                         "token": "1a2b3c4d-573f-4ea7-a67E-XAMPLETOKEN"
                    }
//More content might appear here
}
```

- 3. In a plain-text editor, create a file where you add the following, in JSON format:
 - The name of the pipeline that contains the approval action.
 - The name of the stage that contains the approval action.
 - The name of the approval action.
 - The token value you collected in the previous step.
 - Your response to the action (Approved or Rejected). The response must be capitalized.
 - Your summary comments.

For the preceding *MyFirstPipeline* example, your file should look like this:

```
{
   "pipelineName": "MyFirstPipeline",
   "stageName": "MyApprovalStage",
   "actionName": "MyApprovalAction",
   "token": "1a2b3c4d-573f-4ea7-a67E-XAMPLETOKEN",
   "result": {
        "status": "Approved",
        "summary": "The new design looks good. Ready to release to customers."
   }
}
```

- 4. Save the file with a name like **approvalstage-approved.json**.
- 5. Run the <u>put-approval-result</u> command, specifying the name of the approval JSON file, similar to the following:

🛕 Important

Be sure to include file:// before the file name. It is required in this command.

```
aws codepipeline put-approval-result --cli-input-json file://approvalstage-
approved.json
```

JSON data format for manual approval notifications in CodePipeline

For approval actions that use Amazon SNS notifications, JSON data about the action is created and published to Amazon SNS when the pipeline stops. You can use the JSON output to send messages to Amazon SQS queues or invoke functions in Amazon Lambda.

i Note

This guide does not address how to configure notifications using JSON. For information, see <u>Sending Amazon SNS Messages to Amazon SQS Queues</u> and <u>Invoking Lambda</u> <u>Functions Using Amazon SNS Notifications</u> in the *Amazon SNS Developer Guide*.

The following example shows the structure of the JSON output available with CodePipeline approvals.

```
{
    "region": "us-east-2",
    "consoleLink": "https://console.aws.amazon.com/codepipeline/home?region=us-east-2#/
view/MyFirstPipeline",
    "approval": {
        "pipelineName": "MyFirstPipeline",
        "stageName": "MyApprovalStage",
        "actionName": "MyApprovalAction",
        "token": "1a2b3c4d-573f-4ea7-a67E-XAMPLETOKEN",
        "expires": "2016-07-07T20:22Z",
        "externalEntityLink": "http://example.com",
        "approvalReviewLink": "https://console.aws.amazon.com/codepipeline/
home?region=us-east-2#/view/MyFirstPipeline/MyApprovalStage/MyApprovalAction/
approve/1a2b3c4d-573f-4ea7-a67E-XAMPLETOKEN",
        "customData": "Review the latest changes and approve or reject within seven
 days."
    }
}
```

Add a cross-Region action in CodePipeline

Amazon CodePipeline includes a number of actions that help you configure build, test, and deploy resources for your automated release process. You can add actions to your pipeline that are in an Amazon Region different from your pipeline. When an Amazon Web Services service is the provider for an action, and this action type/provider type are in a different Amazon Region from your pipeline, this is a cross-Region action.

Note

Cross-region actions are supported and can only be created in those Amazon Regions where CodePipeline is supported. For a list of the supported Amazon Regions for CodePipeline, see Quotas in Amazon CodePipeline.

You can use the console, Amazon CLI, or Amazon CloudFormation to add cross-Region actions in pipelines.

Add a cross-Region action to a pipeline

🚯 Note

Certain action types in CodePipeline may only be available in certain Amazon Regions. Also note that there may be Amazon Regions where an action type is available, but a specific Amazon provider for that action type is not available.

When you create or edit a pipeline, you must have an artifact bucket in the pipeline Region and then you must have one artifact bucket per Region where you plan to execute an action. For more information about the ArtifactStores parameter, see <u>CodePipeline pipeline structure reference</u>.

🚯 Note

CodePipeline handles the copying of artifacts from one Amazon Region to the other Regions when performing cross-region actions.

If you use the console to create a pipeline or cross-Region actions, default artifact buckets are configured by CodePipeline in the Regions where you have actions. When you use the Amazon CLI, Amazon CloudFormation, or an SDK to create a pipeline or cross-Region actions, you provide the artifact bucket for each Region where you have actions.

🚯 Note

You must create the artifact bucket and encryption key in the same Amazon Region as the cross-Region action and in the same account as your pipeline.

You cannot create cross-Region actions for the following action types:

- Source actions
- Third-party actions
- Custom actions

🚯 Note

When using cross-Region Lambda invoke action in CodePipeline, the status of the lambda execution using the <u>PutJobSuccessResult</u> and <u>PutJobFailureResult</u> should be sent to the Amazon Region where the Lambda function is present and not to the Region where CodePipeline exists.

When a pipeline includes a cross-Region action as part of a stage, CodePipeline replicates only the input artifacts of the cross-Region action from the pipeline Region to the action's Region.

🚺 Note

The pipeline Region and the Region where your CloudWatch Events change detection resources are maintained remain the same. The Region where your pipeline is hosted does not change.

Manage cross-Region actions in a pipeline (console)

You can use the CodePipeline console to add a cross-Region action to an existing pipeline. To create a new pipeline with cross-Region actions using the Create pipeline wizard, see <u>Create a</u> custom pipeline (console).

In the console, you create a cross-Region action in a pipeline stage by choosing the action provider and the **Region** field, which lists the resources you have created in that region for that provider. When you add a cross-Region action, CodePipeline uses a separate artifact bucket in the action's region. For more information about cross-Region artifact buckets, see <u>CodePipeline pipeline</u> <u>structure reference</u>.

Add a cross-Region action to a pipeline stage (console)

Use the console to add a cross-Region action to a pipeline.

🚯 Note

If the pipeline is running when changes are saved, that execution does not complete.

To add a cross-Region action

- 1. Sign in to the console at http://console.aws.amazon.com/codesuite/codepipeline/home.
- 2. Select your pipeline, and then choose Edit.
- 3. At the bottom of the diagram, choose **+ Add stage** if you are adding a new stage, or choose **Edit stage** if you want to add the action to an existing stage.
- 4. On **Edit: <Stage>**, choose **+ Add action group** to add a serial action. Or choose **+ Add action** to add a parallel action.
- 5. On the **Edit action** page:
 - a. In **Action name**, enter a name for the cross-Region action.
 - b. In Action provider, choose the action provider.
 - c. In **Region**, choose the Amazon Region where you have created or plan to create the resource for the action. When the Region is selected, the available resources for that Region are listed for selection. The **Region** field designates where the Amazon resources are created for this action type and provider type. This field only displays for actions where the action provider is an Amazon Web Services service. The **Region** field defaults to the same Amazon Web Services Region as your pipeline.
 - d. In **Input artifacts** choose the appropriate input from the previous stage. For example, if the previous stage is a source stage, choose **SourceArtifact**.
 - e. Complete all the required fields for the action provider you are configuring.
 - f. In **Output artifacts** choose the appropriate output to the next stage. For example, if the next stage is a deployment stage, choose **BuildArtifact**.
 - g. Choose Save.
- 6. On **Edit: <Stage>**, choose **Done**.
- 7. Choose Save.

Edit a cross-Region action in a pipeline stage (console)

Use the console to edit an existing cross-Region action in a pipeline.

🚯 Note

If the pipeline is running when changes are saved, that execution does not complete.

To edit a cross-Region action

- 1. Sign in to the console at http://console.aws.amazon.com/codesuite/codepipeline/home.
- 2. Select your pipeline, and then choose **Edit**.
- 3. Choose **Edit stage**.
- 4. On **Edit: <Stage>**, choose the icon to edit an existing action.
- 5. On the **Edit action** page, make changes to the fields, as appropriate.
- 6. On **Edit: <Stage>**, choose **Done**.
- 7. Choose **Save**.

Delete a cross-Region action from a pipeline stage (console)

Use the console to delete an existing cross-Region action from a pipeline.

(i) Note

If the pipeline is running when changes are saved, that execution does not complete.

To delete a cross-Region action

- 1. Sign in to the console at http://console.aws.amazon.com/codesuite/codepipeline/home.
- 2. Select your pipeline, and then choose **Edit**.
- 3. Choose Edit stage.
- 4. On Edit: <Stage>, choose the icon to delete an existing action.
- 5. On **Edit: <Stage>**, choose **Done**.
- 6. Choose **Save**.

Add a cross-Region action to a pipeline (CLI)

You can use the Amazon CLI to add a cross-Region action to an existing pipeline.

To create a cross-Region action in a pipeline stage with the Amazon CLI, you add the configuration action along with an optional region field. You must also have already created an artifact bucket

in the action's region. Instead of providing the artifactStore parameter of the single-region pipeline, you use the artifactStores parameter to include a listing of each Region's artifact bucket.

🚯 Note

In this walkthrough and its examples, *RegionA* is the Region where the pipeline is created. It has access to the *RegionA* Amazon S3 bucket used to store pipeline artifacts and the service role used by CodePipeline. *RegionB* is the region where the CodeDeploy application, deployment group, and service role used by CodeDeploy are created.

Prerequisites

You must have created the following:

- A pipeline in *RegionA*.
- An Amazon S3 artifact bucket in *RegionB*.
- The resources for your action, such as your CodeDeploy application and deployment group for a cross-Region deploy action, in *RegionB*.

Add a cross-Region action to a pipeline (CLI)

Use the Amazon CLI to add a cross-Region action to a pipeline.

To add a cross-Region action

1. For a pipeline in *RegionA*, run the **get-pipeline** command to copy the pipeline structure into a JSON file. For example, for a pipeline named MyFirstPipeline, run the following command:

aws codepipeline get-pipeline --name MyFirstPipeline >pipeline.json

This command returns nothing, but the file you created should appear in the directory where you ran the command.

2. Add the region field to add a new stage with your cross-Region action that includes the Region and resources for your action. The following JSON sample adds a Deploy stage with a cross-Region deploy action where the provider is CodeDeploy, in a new region us-east-1.

{

```
"name": "Deploy",
"actions": [
    {
        "inputArtifacts": [
            {
                "name": "SourceArtifact"
            }
        ],
        "name": "Deploy",
        "region": "RegionB",
        "actionTypeId": {
            "category": "Deploy",
            "owner": "AWS",
            "version": "1",
            "provider": "CodeDeploy"
        },
        "outputArtifacts": [],
        "configuration": {
            "ApplicationName": "name",
            "DeploymentGroupName": "name"
        },
        "runOrder": 1
    }
```

3. In the pipeline structure, remove the artifactStore field and add the artifactStores map for your new cross-Region action. The mapping must include an entry for each Amazon Region in which you have actions. For each entry in the mapping, the resources must be in the respective Amazon Region. In the example below, ID-A is the encryption key ID for *RegionA*, and ID-B is the encryption key ID for *RegionB*.

```
"artifactStores":{
    "RegionA":{
        "encryptionKey":{
            "id":"ID-A",
            "type":"KMS"
        },
        "location":"Location1",
        "type":"S3"
    },
    "RegionB":{
        "encryptionKey":{
```

```
"id":"ID-B",
    "type":"KMS"
    },
    "location":"Location2",
    "type":"S3"
}
```

The following JSON example shows the us-west-2 bucket as my-storage-bucket and adds the new us-east-1 bucket named my-storage-bucket-us-east-1.

```
"artifactStores": {
    "us-west-2": {
        "type": "S3",
        "location": "my-storage-bucket"
    },
    "us-east-1": {
        "type": "S3",
        "location": "my-storage-bucket-us-east-1"
    }
},
```

4. If you are working with the pipeline structure retrieved using the get-pipeline command, remove the metadata lines from the JSON file. Otherwise, the update-pipeline command cannot use it. Remove the "metadata": { } lines and the "created", "pipelineARN", and "updated" fields.

For example, remove the following lines from the structure:

```
"metadata": {
   "pipelineArn": "arn:aws:codepipeline:region:account-ID:pipeline-name",
   "created": "date",
   "updated": "date"
}
```

Save the file.

5. To apply your changes, run the **update-pipeline** command, specifying the pipeline JSON file:

<u> Important</u>

Be sure to include file:// before the file name. It is required in this command.

```
aws codepipeline update-pipeline --cli-input-json file://pipeline.json
```

This command returns the entire structure of the edited pipeline. The output is similar to the following.

```
{
    "pipeline": {
        "version": 4,
        "roleArn": "ARN",
        "stages": [
            {
                "name": "Source",
                "actions": [
                     {
                         "inputArtifacts": [],
                         "name": "Source",
                         "actionTypeId": {
                             "category": "Source",
                             "owner": "AWS",
                             "version": "1",
                             "provider": "CodeCommit"
                         },
                         "outputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
                         ],
                         "configuration": {
                             "PollForSourceChanges": "false",
                             "BranchName": "main",
                             "RepositoryName": "MyTestRepo"
                         },
                         "runOrder": 1
                     }
                ]
            },
```

```
{
                "name": "Deploy",
                "actions": [
                    {
                         "inputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
                         ],
                         "name": "Deploy",
                         "region": "us-east-1",
                         "actionTypeId": {
                             "category": "Deploy",
                             "owner": "AWS",
                             "version": "1",
                             "provider": "CodeDeploy"
                         },
                         "outputArtifacts": [],
                         "configuration": {
                             "ApplicationName": "name",
                             "DeploymentGroupName": "name"
                         },
                         "runOrder": 1
                    }
                ]
            }
        ],
        "name": "AnyCompanyPipeline",
        "artifactStores": {
            "us-west-2": {
                "type": "S3",
                "location": "my-storage-bucket"
            },
            "us-east-1": {
                "type": "S3",
                "location": "my-storage-bucket-us-east-1"
            }
        }
    }
}
```

🚯 Note

The **update-pipeline** command stops the pipeline. If a revision is being run through the pipeline when you run the **update-pipeline** command, that run is stopped. You must manually start the pipeline to run that revision through the updated pipeline. Use the **start-pipeline-execution** command to manually start your pipeline.

6. After you update your pipeline, the cross-Region action is displayed in the console.

Source	0	
CodeCommit		
Succeeded - 29 days ago dbb74de1		
Source: Added codepipeline-codecommi	t-events.yml dbb74de1 🖸	
Disable transition		
⊘ Deploy		View current revisions
Deploy	0	
Cross-region action	•	
Succeeded - 29 days ago		
Details 🖸		

Add a cross-Region action to a pipeline (Amazon CloudFormation)

You can use Amazon CloudFormation to add a cross-Region action to an existing pipeline.

To add a cross-Region action with Amazon CloudFormation

1. Add the Region parameter to the ActionDeclaration resource in your template, as shown in this example:

```
ActionDeclaration:

Type: Object

Properties:

ActionTypeId:

Type: ActionTypeId

Required: true

Configuration:

Type: Map

InputArtifacts:
```

```
Type: Array
  ItemType:
    Type: InputArtifact
Name:
  Type: String
  Required: true
OutputArtifacts:
  Type: Array
  ItemType:
    Type: OutputArtifact
RoleArn:
  Type: String
RunOrder:
  Type: Integer
Region:
  Type: String
```

2. Under Mappings, add the region map as shown in this example for a mapping named SecondRegionMap that maps values for the keys RegionA and RegionB. Under the Pipeline resource, under the artifactStore field, add the artifactStores map for your new cross-Region action as follows:

```
Mappings:
 SecondRegionMap:
   RegionA:
      SecondRegion: "RegionB"
   RegionB:
      SecondRegion: "RegionA"
. . .
          Properties:
            ArtifactStores:
                Region: RegionB
                ArtifactStore:
                  Type: "S3"
                  Location: test-cross-region-artifact-store-bucket-RegionB
                Region: RegionA
                ArtifactStore:
                  Type: "S3"
                  Location: test-cross-region-artifact-store-bucket-RegionA
```

The following YAML example shows the *RegionA* bucket as us-west-2 and adds the new *RegionB* bucket, eu-central-1:

```
Mappings:
 SecondRegionMap:
    us-west-2:
      SecondRegion: "eu-central-1"
    eu-central-1:
      SecondRegion: "us-west-2"
. . .
          Properties:
            ArtifactStores:
                Region: eu-central-1
                ArtifactStore:
                  Type: "S3"
                  Location: test-cross-region-artifact-store-bucket-eu-central-1
                Region: us-west-2
                ArtifactStore:
                  Type: "S3"
                  Location: test-cross-region-artifact-store-bucket-us-west-2
```

- 3. Save the updated template to your local computer, and then open the Amazon CloudFormation console.
- 4. Choose your stack, and then choose **Create Change Set for Current Stack**.
- 5. Upload the template, and then view the changes listed in Amazon CloudFormation. These are the changes to be made to the stack. You should see your new resources in the list.
- 6. Choose **Execute**.

Working with variables

Some actions in CodePipeline generate variables. To use variables:

• You assign a namespace to an action to make the variables it produces available to a downstream action configuration.

• You configure the downstream action to consume the variables generated by the action.

You can view the details for each action execution to see the values for each output variable that was generated by the action in execution-time.

To see step-by-step examples of using variables:

- For a tutorial with a Lambda action that uses variables from an upstream action (CodeCommit) and generates output variables, see Tutorial: Using variables with Lambda invoke actions.
- For a tutorial with a Amazon CloudFormation action that references stack output variables from an upstream CloudFormation action, see <u>Tutorial: Create a pipeline that uses variables from</u> <u>Amazon CloudFormation deployment actions</u>.
- For an example manual approval action with message text that references output variables that resolve to the CodeCommit commit ID and commit message, see Example: Use variables in manual approvals.
- For an example CodeBuild action with an environment variable that resolves to the GitHub branch name, see Example: Use a BranchName variable with CodeBuild environment variables.
- CodeBuild actions produce as variables all environment variables that were exported as part of the build. For more information, see <u>CodeBuild action output variables</u>. For a list of the environment variables you can use in CodeBuild, see <u>Environment variables in build</u> environments in the *Amazon CodeBuild User Guide*.

Topics

- Configure actions for variables
- View output variables
- Example: Use variables in manual approvals
- Example: Use a BranchName variable with CodeBuild environment variables

Configure actions for variables

When you add an action to your pipeline, you can assign it a namespace and configure it to consume variables from previous actions.

Configure actions with variables (console)

This example creates a pipeline with a CodeCommit source action and a CodeBuild build action. The CodeBuild action is configured to consume the variables produced by the CodeCommit action.

If the namespace isn't specified, the variables are not available for reference in the action configuration. When you use the console to create a pipeline, the namespace for each action is generated automatically.

To create a pipeline with variables

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. Choose **Create pipeline**. Enter a name for your pipeline, and then choose **Next**.
- 3. In **Source**, in **Provider**, choose **CodeCommit**. Choose the CodeCommit repository and branch for the source action, and then choose **Next**.
- 4. In **Build**, in **Provider**, choose **CodeBuild**. Choose an existing CodeBuild build project name or choose **Create project**. On **Create build project**, create a build project, and then choose **Return to CodePipeline**.

Under **Environment variables**, choose **Add environment variables**. For example, enter the execution ID with the variable syntax #{codepipeline.PipelineExecutionId} and commit ID with the variable syntax #{SourceVariables.CommitId}.

🚯 Note

You can enter variable syntax in any action configuration field in the wizard.

- 5. Choose Create.
- 6. After the pipeline is created, you can view the namespace that was created by the wizard. On the pipeline, choose the icon for the stage you want to view the namespace for. In this example, the source action's auto-generated namespace, SourceVariables, is displayed.

Configuration		×
Variable namespace	SourceVariables	
Output artifact	SourceArtifact	
BranchName	main	
PollForSourceChanges	false	
RepositoryName	repo	
		Done

To edit the namespace for an existing action

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. Choose the pipeline you want to edit, and then choose **Edit**. For the source stage, choose **Edit stage**. Add the CodeCommit action.
- 3. On **Edit action**, view the **Variable namespace** field. If the existing action was created previously or without using the wizard, you must add a namespace. In **Variable namespace**, enter a namespace name, and then choose **Save**.

To view output variables

- 1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.
- 2. After the pipeline is created and runs successfully, you can view the variables on the **Action execution details** page. For information, see View variables (console).

Configure actions for variables (CLI)

When you use the **create-pipeline** command to create a pipeline or the **update-pipeline** command to edit a pipeline, you can reference/use variables in the configuration of an action.

If the namespace isn't specified, the variables produced by the action are not available to be referenced in any downstream action configuration.

To configure an action with a namespace

 Follow the steps in <u>Create a pipeline, stages, and actions</u> to create a pipeline using the CLI. Start an input file to provide the create-pipeline command with the --cli-input-json parameter. In the pipeline structure, add the namespace parameter and specify a name, such as SourceVariables.

```
{
    "inputArtifacts": [],
    "name": "Source",
    "region": "us-west-2",
    "namespace": "SourceVariables",
    "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "CodeCommit"
    },
    "outputArtifacts": [
```

- 2. Save the file with a name like **MyPipeline.json**.
- 3. At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the <u>create-pipeline</u> command and create the pipeline.

Call the file you created when you run the **create-pipeline** command. For example:

aws codepipeline create-pipeline --cli-input-json file://MyPipeline.json

To configure downstream actions to consume variables

1. Edit an input file to provide the update-pipeline command with the --cli-input-json parameter. In the downstream action, add the variable to the configuration for that action. A variable is made up of a namespace and key, separated by a period. For example, to add variables for the pipeline execution ID and the source commit ID, specify the namespace codepipeline for the variable #{codepipeline.PipelineExecutionId}. Specify the namespace SourceVariables for the variable #{SourceVariables.CommitId}.

```
{
    "name": "Build",
    "actions": [
        {
            "outputArtifacts": [
                {
                    "name": "BuildArtifacts"
                }
            ],
            "name": "Build",
            "configuration": {
                "EnvironmentVariables": "[{\"name\":\"Execution_ID\",\"value
\":\"#{codepipeline.PipelineExecutionId}\",\"type\":\"PLAINTEXT\"},{\"name\":
\"Commit_ID\",\"value\":\"#{SourceVariables.CommitId}\",\"type\":\"PLAINTEXT\"}]",
                "ProjectName": "env-var-test"
            },
            "inputArtifacts": [
                {
                    "name": "SourceArtifact"
                }
            ],
            "region": "us-west-2",
            "actionTypeId": {
                "provider": "CodeBuild",
                "category": "Build",
                "version": "1",
                "owner": "AWS"
            },
            "runOrder": 1
        }
    ]
},
```

- 2. Save the file with a name like **MyPipeline.json**.
- 3. At a terminal (Linux, OS X, or Unix) or command prompt (Windows), run the <u>create-pipeline</u> command and create the pipeline.

Call the file you created when you run the create-pipeline command. For example:

aws codepipeline create-pipeline --cli-input-json file://MyPipeline.json

View output variables

You can view the action execution details to view the variables for that action, specific to each execution.

View variables (console)

You can use the console to view variables for an action.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline.
- 3. Choose View history.
- 4. After the pipeline runs successfully, you can view the variables produced by the source action. Choose **View history**. Choose **Source** in the action list for the pipeline execution to view the action execution details for the CodeCommit action. On the action detail screen, view the variables under **Output variables**.

Output variables	
Кеу	Value
AuthorDate	2019-10-29T03:32:21Z
BranchName	master
CommitId	8cf40f22b935b306f06d214517e98aet
CommitMessage	Added LICENSE.txt
CommitterDate	2019-10-29T03:32:21Z
RepositoryName	repo

5. After the pipeline runs successfully, you can view the variables consumed by the build action. Choose **View history**. In the action list for the pipeline execution, choose **Build** to view the action execution details for the CodeBuild action. On the action detail page, view the variables under **Action configuration**. The auto-generated namespace is displayed.

Action configuration		Show resolved configuration
EnvironmentVariables [{"name":"Execution_ID","value":"# {codepipeline.PipelineExecutionId}","type":"PLAINTEXT"), {"name":"Commit_ID","value":"#{SourceVariables.CommitId}","type":"PLAINTEXT"}]	ProjectName dk-var-build-proj	

By default, **Action configuration** displays the variable syntax. You can choose **Show resolved configuration** to toggle the list to display the values that were produced during the action execution.

Action configuration		Show resolved configuration
EnvironmentVariables	ProjectName	
[('name":"Execution_ID",'value": ab9f6ead-a64c-4fd5-b6aa- 3bf ",'type":"PLAINTEXT"), ('name":"Commit_ID",'value": %Efd0f22b935b306f06d214517e ","type"	var-build-proj	
:"PLAINTEXT"}]		

View variables (CLI)

You can use the list-action-executions command to view variables for an action.

1. Use the following command:

```
aws codepipeline list-action-executions
```

The output shows the outputVariables parameter as shown here.

```
"outputVariables": {
    "BranchName": "main",
    "CommitMessage": "Updated files for test",
    "AuthorDate": "2019-11-08T22:24:34Z",
    "CommitId": "d99b0083cc10EXAMPLE",
    "CommitterDate": "2019-11-08T22:24:34Z",
    "RepositoryName": "variables-repo"
},
```

2. Use the following command:

aws codepipeline get-pipeline --name <pipeline-name>

In the action configuration for the CodeBuild action, you can view the variables:

```
{
    "name": "Build",
    "actions": [
        {
            "outputArtifacts": [
                {
                     "name": "BuildArtifact"
                }
            ],
            "name": "Build",
            "configuration": {
                "EnvironmentVariables": "[{\"name\":\"Execution_ID\",\"value
\":\"#{codepipeline.PipelineExecutionId}\",\"type\":\"PLAINTEXT\"},{\"name\":
\"Commit_ID\",\"value\":\"#{SourceVariables.CommitId}\",\"type\":\"PLAINTEXT\"}]",
                "ProjectName": "env-var-test"
            },
            "inputArtifacts": [
                {
                    "name": "SourceArtifact"
                }
            ],
            "region": "us-west-2",
            "actionTypeId": {
                "provider": "CodeBuild",
                "category": "Build",
                "version": "1",
                "owner": "AWS"
            },
            "runOrder": 1
        }
    ]
},
```

Example: Use variables in manual approvals

When you specify a namespace for an action, and that action produces output variables, you can add a manual approval that displays variables in the approval message. This example shows you how to add variable syntax to a manual approval message.

Example: Use variables in manual approvals

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed. Choose the pipeline you want to add the approval to.

- 2. To edit your pipeline, choose **Edit**. Add a manual approval after the source action. In **Action name**, enter the name of the approval action.
- 3. In Action provider, choose Manual approval.
- 4. In URL for review, add the variable syntax for CommitId to your CodeCommit URL. Make sure you use the namespace assigned to your source action. For example, the variable syntax for a CodeCommit action with the default namespace SourceVariables is #{SourceVariables.CommitId}.

In **Comments**, in CommitMessage, enter the commit message:

Please approve this change. Commit message: #{SourceVariables.CommitMessage}

5. After the pipeline runs successfully, you can view the variable values in the approval message.

Example: Use a BranchName variable with CodeBuild environment variables

When you add a CodeBuild action to your pipeline, you can use CodeBuild environment variables to reference a BranchName output variable from an upstream source action. With an output variable from an action in CodePipeline, you can create your own CodeBuild environment variables for use in your build commands.

This example shows you how to add output variable syntax from a GitHub source action to a CodeBuild environment variable. The output variable syntax in this example represents the GitHub source action output variable for BranchName. After the action runs successfully, the variable resolves to show the GitHub branch name.

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at http://console.www.amazonaws.cn/codesuite/codepipeline/home.

The names of all pipelines associated with your Amazon account are displayed. Choose the pipeline you want to add the approval to.

- 3. Choose the icon to edit your CodeBuild action.
- 4. On the **Edit action** page, under **Environment variables**, enter the following:
 - In **Name**, enter a name for your environment variable.
 - In Value, enter the variable syntax for your pipeline output variable, which includes the namespace assigned to your source action. For example, the output variable syntax for a GitHub action with the default namespace SourceVariables is #{SourceVariables.BranchName}.
 - In Type, choose Plaintext.
- 5. After the pipeline runs successfully, you can see how the resolved output variable is the value in the environment variable. Choose one of the following:
 - **CodePipeline console:** Choose your pipeline, and then choose **History**. Choose the most recent pipeline execution.
 - Under **Timeline**, choose the selector for **Source**. This is the source action that generates GitHub output variables. Choose **View execution details**. Under **Output variables**, view the list of output variables generated by this action.
 - Under Timeline, choose the selector for Build. This is the build action that specifies the CodeBuild environment variables for your build project. Choose View execution details. Under Action configuration, view your CodeBuild environment variables. Choose Show resolved configuration. Your environment variable value is the resolved BranchName output variable from the GitHub source action. In this example, the resolved value is main.

For more information, see View variables (console).

• **CodeBuild console:** Choose your build project and choose the link for your build run. Under **Environment variables**, your resolved output variable is the value for the CodeBuild environment variable. In this example, the environment variable **Name** is BranchName and the **Value** is the resolved BranchName output variable from the GitHub source action. In this example, the resolved value is main.

Build logs Phase details	Reports	Environment variables	Build details	Resource utilization
Name		Value		Туре
BranchName		main		PLAINTEXT

Working with stage transitions in CodePipeline

Transitions are links between pipeline stages that can be disabled or enabled. They are enabled by default. When you re-enable a disabled transition, the latest revision runs through the remaining stages of the pipeline unless more than 30 days have passed. Pipeline execution won't resume for a transition that has been disabled more than 30 days unless a new change is detected or you manually rerun the pipeline.

You can use the Amazon CodePipeline console or the Amazon CLI to disable or enable transitions between stages in a pipeline.

🚯 Note

You can use an approval action to pause the run of a pipeline until it is manually approved to continue. For more information, see <u>Add a manual approval action to a stage</u>.

Topics

- Disable or enable transitions (console)
- Disable or enable transitions (CLI)

Disable or enable transitions (console)

To disable or enable transitions in a pipeline

1. Sign in to the Amazon Web Services Management Console and open the CodePipeline console at <u>http://console.www.amazonaws.cn/codesuite/codepipeline/home</u>.

The names of all pipelines associated with your Amazon account are displayed.

- 2. In **Name**, choose the name of the pipeline for which you want to enable or disable transitions. This opens a detailed view of the pipeline, including the transitions between the stages of the pipeline.
- 3. Find the arrow after the last stage that you want to run, and then choose the button next to it. For example, in the following pipeline, if you want the actions in the **Staging** stage to run, but not the actions in the stage named **Production**, choose the **Disable transition** button between those two stages:

ා Deploy	View current revisions
Deploy (i) CodeDeploy Succeeded - 15 minutes ago	
Details Source: Added codepipeline-codecommit-events.yml dbb	74de
 Production 	View current revisions
Deploy ③ CodeDeploy	
Succeeded - 14 minutes ago Details	
Source: Added codepipeline-codecommit-events.yml dbb	

4. In the **Disable transition** dialog box, enter a reason for disabling the transition, and then choose **Disable**.

The button changes to show that transitions are disabled between the stage preceding the arrow and the stage following the arrow. Any revisions that were already running in the stages that come after the disabled transition continue through the pipeline, but any subsequent revisions do not continue past the disabled transition.

⊙ Deploy	View current revisions
Deploy (j) CodeDeploy	
Succeeded - 3 minutes ago Details	
Source: Added codepipeline-codecommit-events.yml dbb	74de
Enable transition	
⊘ Production	View current revisions
Deploy 🔅	
CodeDeploy	
Succeeded - 2 minutes ago	
Details	\searrow

5. Choose the **Enable transition** button next to the arrow. In the **Enable transition** dialog box, choose **Enable**. The pipeline immediately enables the transition between the two stages. If any revisions have been run through the earlier stages after the transition was disabled, in a few moments, the pipeline starts running the latest revision through the stages after the formerly disabled transition. The pipeline runs the revision through all remaining stages in the pipeline.

Note

It might take a few seconds for changes to appear in the CodePipeline console after you enable the transition.

Disable or enable transitions (CLI)

To disable a transition between stages by using the Amazon CLI, run the **disable-stage-transition** command. To enable a disabled transition, run the **enable-stage-transition** command.

To disable a transition

1. Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the <u>disable-stage-transition</u> command, specifying the name of the pipeline, the name of the stage to which you want to disable transitions, the transition type, and the reason you are disabling transitions to that stage. Unlike using the console, you must also specify whether you are disabling transitions into the stage (inbound) or transitions out of the stage after all actions complete (outbound).

For example, to disable the transition to a stage named *Staging* in a pipeline named *MyFirstPipeline*, you would type a command similar to the following:

```
aws codepipeline disable-stage-transition --pipeline-name MyFirstPipeline --stage-
name Staging --transition-type Inbound --reason "My Reason"
```

The command returns nothing.

 To verify the transition has been disabled, either view the pipeline in the CodePipeline console or run the get-pipeline-state command. For more information, see <u>View pipelines (console)</u> and <u>View pipeline details and history (CLI)</u>.

To enable a transition

 Open a terminal (Linux, OS X, or Unix) or command prompt (Windows) and use the Amazon CLI to run the <u>enable-stage-transition</u> command, specifying the name of the pipeline, the name of the stage to which you want to enable transitions, and the transition type.

For example, to enable the transition to a stage named *Staging* in a pipeline named *MyFirstPipeline*, you would type a command similar to the following:

```
aws codepipeline enable-stage-transition --pipeline-name MyFirstPipeline --stage-
name Staging --transition-type Inbound
```

The command returns nothing.

 To verify the transition has been disabled, either view the pipeline in the CodePipeline console or run the get-pipeline-state command. For more information, see <u>View pipelines (console)</u> and <u>View pipeline details and history (CLI)</u>.

Monitoring pipelines

Monitoring is an important part of maintaining the reliability, availability, and performance of Amazon CodePipeline. You should collect monitoring data from all parts of your Amazon solution so that you can more easily debug a multi-point failure, if one occurs. Before you start monitoring, you should create a monitoring plan that answers the following questions:

- What are your monitoring goals?
- Which resources will you monitor?
- How often will you monitor these resources?
- Which monitoring tools are available for you to use?
- Who will perform the monitoring tasks?
- Who should be notified if something goes wrong?

You can use the following tools to monitor your CodePipeline pipelines and their resources:

- EventBridge event bus events You can monitor CodePipeline events in EventBridge, which detects changes in your pipeline, stage, or action execution status. EventBridge routes that data to targets such as Amazon Lambda and Amazon Simple Notification Service. EventBridge events are the same as those that appear in Amazon CloudWatch Events.
- Notifications for pipeline events in the Developer Tools console You can monitor CodePipeline events with notifications that you set up in the console and then create an Amazon Simple Notification Service topic and subscription for. For more information, see <u>What are</u> <u>notifications</u> in the *Developer Tools Console User Guide*.
- Amazon CloudTrail Use CloudTrail to capture API calls made by or on behalf of CodePipeline in your Amazon account and deliver the log files to an Amazon S3 bucket. You can choose to have CloudWatch publish Amazon SNS notifications when new log files are delivered so you can take quick action.
- **Console and CLI** You can use the CodePipeline console and CLI to view details about the status of a pipeline or a particular pipeline execution.

Topics

- Monitoring CodePipeline events
- Events placeholder bucket reference

- Logging CodePipeline API calls with Amazon CloudTrail
- CodePipeline CloudWatch metrics

Monitoring CodePipeline events

You can monitor CodePipeline events in EventBridge, which delivers a stream of real-time data from your own applications, software-as-a-service (SaaS) applications, and Amazon Web Services services. EventBridge routes that data to targets such as Amazon Lambda and Amazon Simple Notification Service. These events are the same as those that appear in Amazon CloudWatch Events, which delivers a near real-time stream of system events that describe changes in Amazon resources. For more information, see <u>What Is Amazon EventBridge</u>? in the *Amazon EventBridge User Guide*.

Note

Amazon EventBridge is the preferred way to manage your events. Amazon CloudWatch Events and EventBridge are the same underlying service and API, but EventBridge provides more features. Changes you make in either CloudWatch Events or EventBridge will appear in each console.

Events are composed of rules. A rule is configured by choosing the following:

- Event Pattern. Each rule is expressed as an event pattern with the source and type of events to monitor, and event targets. To monitor events, you create a rule with the service you are monitoring as the event source, such as CodePipeline. For example, you can create a rule with an event pattern that that uses CodePipeline as an event source to trigger the rule when there are changes in the state of a pipeline, stage, or action.
- **Targets.** The new rule receives a selected service as the event target. You might want to set up a target service to send notifications, capture state information, take corrective action, initiate events, or take other actions. When you add your target, you must also grant permissions to EventBridge to allow it to invoke the selected target service.

Each type of execution state change event emits notifications with specific message content, where:

- The initial version entry shows the version number for the event.
- The version entry under pipeline detail shows the pipeline structure version number.
- The execution-id entry under pipeline detail shows the execution ID for the pipeline execution that caused the state change. Refer to the **GetPipelineExecution** API call in the Amazon CodePipeline API Reference.
- The pipeline-execution-attempt entry shows the number of attempts, or retries, for the specific execution ID.

CodePipeline reports an event to EventBridge whenever the state of a resource in your Amazon Web Services account changes. Events are emitted on a guaranteed, at-least-once basis for the following resources:

- Pipeline executions
- Stage executions
- Action executions

Events are emitted by EventBridge with the event pattern and schema detailed above. For processed events, such as events you receive through notifications you have configured in the Developer Tools console, the event message includes event pattern fields with some variation. For example, the detail-type field is converted to detailType. For more information, refer to the **PutEvents** API call in the Amazon EventBridge API Reference.

The following examples show events for CodePipeline. Where possible, each example shows the schema for an emitted event along with the schema for a processed event.

Topics

- Detail types
- Pipeline-level events
- Stage-level events
- <u>Action-level events</u>
- <u>Create a Rule That Sends a Notification on a Pipeline Event</u>

Detail types

When you set up events to monitor, you can choose the detail type for the event.

You can configure notifications to be sent when the state changes for:

- Specified pipelines or all your pipelines. You control this by using "detail-type": "CodePipeline Pipeline Execution State Change".
- Specified stages or all your stages, within a specified pipeline or all your pipelines. You control this by using "detail-type": "CodePipeline Stage Execution State Change".
- Specified actions or all actions, within a specified stage or all stages, within a specified pipeline or all your pipelines. You control this by using "detail-type": "CodePipeline Action Execution State Change".

🚯 Note

Events emitted by EventBridge contain the detail-type parameter, which is converted to detailType when events are processed.

Detail type	State	Description
CodePipel ine Pipeline Execution State Change	CANCELED	The pipeline execution was canceled because the pipeline structure was updated.
	FAILED	The pipeline execution was not completed successfully.
	RESUMED	A failed pipeline execution has been retried in response to the RetryStageExecution API call.
	STARTED	The pipeline execution is currently running.
	STOPPED	The stopping process is complete, and the pipeline execution is stopped.
	STOPPING	The pipeline execution is stopping due to a request to either stop and wait or stop and abandon the pipeline execution.
	SUCCEEDED	The pipeline execution was completed successfully.

Amazon CodePipeline

User Guide

Detail type	State	Description
CodePipeline Stage Execution State Change	SUPERSEDED	While this pipeline execution was waiting for the next stage to be completed, a newer pipeline execution advanced and continued through the pipeline instead.
	CANCELED	The stage was canceled because the pipeline structure was updated.
	FAILED	The stage was not completed successfully.
	RESUMED	A failed stage has been retried in response to the RetryStageExecution API call.
	STARTED	The stage is currently running.
	STOPPED	The stopping process is complete, and the stage execution is stopped.
	STOPPING	The stage execution is stopping due to a request to either stop and wait or stop and abandon the pipeline execution.
	SUCCEEDED	The stage was completed successfully.
CodePipeline Action Execution State Change	ABANDONED	The action is abandoned due to a request to stop and abandon the pipeline execution.
	CANCELED	The action was canceled because the pipeline structure was updated.
	FAILED	For approval actions, the FAILED state means the action was either rejected by the reviewer or failed due to an incorrect action configuration.
	STARTED	The action is currently running.
	SUCCEEDED	The action was completed successfully.

Pipeline-level events

Pipeline-level events are emitted when there is a state change for a pipeline execution.

Topics

- Pipeline STARTED event
- Pipeline STOPPING event
- <u>Pipeline SUCCEEDED event</u>
- Pipeline SUCCEEDED (example with Git tags)
- Pipeline FAILED event
- Pipeline FAILED (example with Git tags)

Pipeline STARTED event

When a pipeline execution starts, it emits an event that sends notifications with the following content. This example is for the pipeline named "myPipeline" in the us-east-1 Region. The id field represents the event ID, and the account field represents the account ID where the pipeline is created.

Emitted event

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Pipeline Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-24T22:03:07Z",
    "region": "us-east-1",
    "resources": [
        "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "execution-trigger": {
            "trigger-type": "StartPipelineExecution",
            "trigger-detail": "arn:aws:sts::123456789012:assumed-role/Admin/my-user"
```

```
},
"state": "STARTED",
"version": 1.0,
"pipeline-execution-attempt": 1.0
}
```

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Pipeline Execution State Change",
    "region": "us-east-1",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:44:50Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
east-1:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "execution-trigger": {
            "trigger-type": "StartPipelineExecution",
            "trigger-detail": "arn:aws:sts::123456789012:assumed-role/Admin/my-user"
        },
        "state": "STARTED",
        "version": 1.0,
        "pipeline-execution-attempt": 1.0
    },
    "resources": [
        "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
    ],
    "additionalAttributes": {}
}
```

Pipeline STOPPING event

When a pipeline execution is stopping, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the us-west-2 Region.

```
{
    "version": "0",
```

```
"id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Pipeline Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-24T22:02:20Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "state": "STOPPING",
        "version": 3.0,
        "pipeline-execution-attempt": 1.0
        "stop-execution-comments": "Stopping the pipeline for an update"
    }
}
```

Pipeline SUCCEEDED event

When a pipeline execution succeeds, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the us-east-1 Region.

Emitted event

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Pipeline Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-24T22:03:44Z",
    "region": "us-east-1",
    "resources": [
        "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "state": "SUCCEEDED",
```

```
"version": 3.0,
"pipeline-execution-attempt": 1.0
}
```

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Pipeline Execution State Change",
    "region": "us-east-1",
    "source": "aws.codepipeline",
    "time": "2021-06-30T22:13:51Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "state": "SUCCEEDED",
        "version": 1.0,
        "pipeline-execution-attempt": 1.0
    },
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "additionalAttributes": {}
}
```

Pipeline SUCCEEDED (example with Git tags)

When a pipeline execution has a stage that has been retried and succeeded, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the eu-central-1 Region where the execution-trigger is configured for Git tags.

1 Note

The execution-trigger field will have either tag-name or branch-name, depending on what kind of event triggered the pipeline.

Pipeline-level events

```
{
    "version": "0",
    "id": "b128b002-09fd-4574-4eba-27152726c777",
    "detail-type": "CodePipeline Pipeline Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2023-10-26T13:50:53Z",
    "region": "eu-central-1",
    "resources": [
        "arn:aws:codepipeline:eu-central-1:123456789012:BuildFromTag"
    ],
    "detail": {
        "pipeline": "BuildFromTag",
        "execution-id": "e17b5773-cc0d-4db2-9ad7-594c73888de8",
        "start-time": "2023-10-26T13:49:39.208Z",
        "execution-trigger": {
            "author-display-name": "Mary Major",
            "full-repository-name": "mmajor/sample-project",
            "provider-type": "GitLab",
            "author-email": "email_address",
            "commit-message": "Update file README.md",
            "author-date": "2023-08-16T21:08:08Z",
            "tag-name": "gitlab-v4.2.1",
            "commit-id": "commit_ID",
            "connection-arn": "arn:aws:codestar-connections:eu-
central-1:123456789012:connection/0f5b706a-1a1d-46c5-86b6-f177321bcfb2",
            "author-id": "Mary Major"
        },
        "state": "SUCCEEDED",
        "version": 32.0,
        "pipeline-execution-attempt": 1.0
    }
}
```

Pipeline FAILED event

When a pipeline execution fails, it emits an event that sends notifications with the following content. This example is for the pipeline named "myPipeline" in the us-west-2 Region.

Emitted event

{

"version": "0",

```
"id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Pipeline Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-31T18:55:43Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "state": "FAILED",
        "version": 4.0,
        "pipeline-execution-attempt": 1.0
    }
}
```

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Pipeline Execution State Change",
    "region": "us-west-2",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:46:16Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "state": "FAILED",
        "version": 1.0,
        "pipeline-execution-attempt": 1.0
    },
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "additionalAttributes": {
        "failedActionCount": 1,
        "failedActions": [
```

```
{
    "action": "Deploy",
    "additionalInformation": "Deployment <ID> failed"
    }
],
"failedStage": "Deploy"
}
```

Pipeline FAILED (example with Git tags)

Unless it fails at the source stage, for a pipeline configure with triggers, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the eu-central-1 Region where the execution-trigger is configured for Git tags.

🚺 Note

The execution-trigger field will have either tag-name or branch-name, depending on what kind of event triggered the pipeline.

Emitted event

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Pipeline Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-31T18:55:43Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "execution-trigger": {
            "author-display-name": "Mary Major",
            "full-repository-name": "mmajor/sample-project",
            "provider-type": "GitLab",
```

```
"author-email": "email_address",
    "commit-message": "Update file README.md",
    "author-date": "2023-08-16T21:08:08Z",
    "tag-name": "gitlab-v4.2.1",
    "commit-id": "commit_ID",
    "connection-arn": "arn:aws:codestar-connections:eu-
central-1:123456789012:connection/0f5b706a-1a1d-46c5-86b6-f177321bcfb2",
    "author-id": "Mary Major"
    },
    "state": "FAILED",
    "version": 4.0,
    "pipeline-execution-attempt": 1.0
  }
}
```

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Pipeline Execution State Change",
    "region": "us-west-2",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:46:16Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "execution-trigger": {
            "author-display-name": "Mary Major",
            "full-repository-name": "mmajor/sample-project",
            "provider-type": "GitLab",
            "author-email": "email_address",
            "commit-message": "Update file README.md",
            "author-date": "2023-08-16T21:08:08Z",
            "tag-name": "gitlab-v4.2.1",
            "commit-id": "commit_ID",
            "connection-arn": "arn:aws:codestar-connections:eu-
central-1:123456789012:connection/0f5b706a-1a1d-46c5-86b6-f177321bcfb2",
            "author-id": "Mary Major"
        },
        "state": "FAILED",
```

```
"version": 1.0,
    "pipeline-execution-attempt": 1.0
},
"resources": [
    "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
],
"additionalAttributes": {
    "failedActionCount": 1,
    "failedActions": [
        {
            "action": "Deploy",
            "additionalInformation": "Deployment <ID> failed"
        }
    ],
    "failedStage": "Deploy"
}
```

Stage-level events

Stage-level events are emitted when there is a state change for a stage execution.

Topics

- Stage STARTED event
- <u>Stage STOPPING event</u>
- Stage STOPPED event
- Stage RESUMED after stage retry event

Stage STARTED event

When a stage execution starts, it emits an event that sends notifications with the following content. This example is for the pipeline named "myPipeline" in the us-east-1 Region, for the stage Prod.

Emitted event

```
{
    "version": "0",
    "id": 01234567-EXAMPLE,
    "detail-type": "CodePipeline Stage Execution State Change",
```

```
"source": "aws.codepipeline",
"account": 123456789012,
"time": "2020-01-24T22:03:07Z",
"region": "us-east-1",
"resources": [
    "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
],
"detail": {
    "pipeline": "myPipeline",
    "version": 1.0,
    "execution-id": 12345678-1234-5678-abcd-12345678abcd,
    "start-time": "2023-10-26T13:49:39.208Z",
    "stage": "Prod",
    "state": "STARTED",
    "pipeline-execution-attempt": 1.0
}
```

}

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Stage Execution State Change",
    "region": "us-east-1",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:45:40Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "stage": "Source",
        "state": "STARTED",
        "version": 1.0,
        "pipeline-execution-attempt": 0.0
    },
    "resources": [
        "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
    ],
    "additionalAttributes": {
        "sourceActions": [
            {
```

}

```
"sourceActionName": "Source",
    "sourceActionProvider": "CodeCommit",
    "sourceActionVariables": {
        "BranchName": "main",
        "CommitId": "<ID>",
        "RepositoryName": "my-repo"
      }
    }
]
```

Stage STOPPING event

When a stage execution is stopping, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the us-west-2 Region, for the stage Deploy.

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Stage Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-24T22:02:20Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "stage": "Deploy",
        "state": "STOPPING",
        "version": 3.0,
        "pipeline-execution-attempt": 1.0
    }
}
```

Stage STOPPED event

When a stage execution is stopped, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the us-west-2 Region, for the stage Deploy.

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Stage Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-31T18:21:39Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:49:39.208Z",
        "stage": "Deploy",
        "state": "STOPPED",
        "version": 3.0,
        "pipeline-execution-attempt": 1.0
    }
}
```

Stage RESUMED after stage retry event

When a stage execution is resumed and has a stage that has been retried, it emits an event that sends notifications with the following content.

When a stage has been retried, the stage-last-retry-attempt-time field displays, as shown in the example. The field displays on all stage events if a retry was performed.

1 Note

The stage-last-retry-attempt-time field will be present in all the subsequent stage events after a stage has been retried.

```
{
    "version": "0",
    "id": "38656bcd-a798-5f92-c738-02a71be484e1",
    "detail-type": "CodePipeline Stage Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2023-10-26T14:14:56Z",
    "region": "eu-central-1",
    "resources": [
        "arn:aws:codepipeline:eu-central-1:123456789012:BuildFromTag"
    ],
    "detail": {
        "pipeline": "BuildFromTag",
        "execution-id": "05dafb6a-5a56-4951-a858-968795364846",
        "stage-last-retry-attempt-time": "2023-10-26T14:14:56.305Z",
        "stage": "Build",
        "state": "RESUMED",
        "version": 32.0,
        "pipeline-execution-attempt": 2.0
    }
}
```

Action-level events

Action-level events are emitted when there is a state change for an action execution.

Topics

- <u>Action STARTED event</u>
- <u>Action SUCCEEDED event</u>
- <u>Action FAILED event</u>
- Action ABANDONED event

Action STARTED event

When an action execution starts, it emits an event that sends notifications with the following content. This example is for the pipeline named myPipeline in the us-east-1 Region, for the deployment action myAction.

Action-level events

Emitted event

```
{
    "version": "0",
    "id": 01234567-EXAMPLE,
    "detail-type": "CodePipeline Action Execution State Change",
    "source": "aws.codepipeline",
    "account": 123456789012,
    "time": "2020-01-24T22:03:07Z",
    "region": "us-east-1",
    "resources": [
        "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": 12345678-1234-5678-abcd-12345678abcd,
        "start-time": "2023-10-26T13:51:09.981Z",
        "stage": "Prod",
        "action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
        "action": "myAction",
        "state": "STARTED",
        "type": {
            "owner": "AWS",
            "category": "Deploy",
            "provider": "CodeDeploy",
            "version": "1"
        },
        "version": 2.0
        "pipeline-execution-attempt": 1.0
        "input-artifacts": [
            {
                "name": "SourceArtifact",
                "s3location": {
                    "bucket": "codepipeline-us-east-1-BUCKETEXAMPLE",
                    "key": "myPipeline/SourceArti/KEYEXAMPLE"
                }
            }
        ]
    }
}
```

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Action Execution State Change",
    "region": "us-west-2",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:45:44Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:51:09.981Z",
        "stage": "Deploy",
        "action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
        "action": "Deploy",
        "input-artifacts": [
            {
                "name": "SourceArtifact",
                "s3location": {
                    "bucket": "codepipeline-us-east-1-EXAMPLE",
                    "key": "myPipeline/SourceArti/EXAMPLE"
                }
            }
        ],
        "state": "STARTED",
        "region": "us-east-1",
        "type": {
            "owner": "AWS",
            "provider": "CodeDeploy",
            "category": "Deploy",
            "version": "1"
        },
        "version": 1.0,
        "pipeline-execution-attempt": 1.0
    },
    "resources": [
        "arn:aws:codepipeline:us-east-1:123456789012:myPipeline"
    ],
    "additionalAttributes": {}
}
```

Action SUCCEEDED event

When an action execution succeeds, it emits an event that sends notifications with the following content. This example is for the pipeline named "myPipeline" in the us-west-2 Region, for the source action "Source". For this event type, there are two different region fields. The event region field specifies the Region for the pipeline event. The region field under the detail section specifies the Region for the action.

Emitted event

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Action Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-24T22:03:11Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:51:09.981Z",
        "stage": "Source",
        "execution-result": {
            "external-execution-url": "https://us-west-2.console.aws.amazon.com/
codecommit/home#/repository/my-repo/commit/8cf40f2EXAMPLE",
            "external-execution-summary": "Added LICENSE.txt",
            "external-execution-id": "8cf40fEXAMPLE"
        },
        "output-artifacts": [
            {
                "name": "SourceArtifact",
                "s3location": {
                    "bucket": "codepipeline-us-west-2-BUCKETEXAMPLE",
                    "key": "myPipeline/SourceArti/KEYEXAMPLE"
                }
            }
        ],
        "action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
        "action": "Source",
```

```
"state": "SUCCEEDED",
"region": "us-west-2",
"type": {
    "owner": "AWS",
    "provider": "CodeCommit",
    "category": "Source",
    "version": "1"
  },
  "version": 3.0,
  "pipeline-execution-attempt": 1.0
}
```

}

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Action Execution State Change",
    "region": "us-west-2",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:45:44Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:ACCOUNT:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "arn:aws:codepipeline:us-west-2:123456789012:myPipeline",
        "start-time": "2023-10-26T13:51:09.981Z",
        "stage": "Source",
        "execution-result": {
            "external-execution-url": "https://us-west-2.console.aws.amazon.com/
codecommit/home#/repository/my-repo/commit/8cf40f2EXAMPLE",
            "external-execution-summary": "Edited index.html",
            "external-execution-id": "36ab3ab7EXAMPLE"
        },
        "output-artifacts": [
            {
                "name": "SourceArtifact",
                "s3location": {
                    "bucket": "codepipeline-us-west-2-EXAMPLE",
                    "key": "myPipeline/SourceArti/EXAMPLE"
                }
            }
        ],
```

```
"action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
        "action": "Source",
        "state": "SUCCEEDED",
        "region": "us-west-2",
        "type": {
            "owner": "AWS",
            "provider": "CodeCommit",
            "category": "Source",
            "version": "1"
        },
        "version": 1.0,
        "pipeline-execution-attempt": 1.0
    },
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "additionalAttributes": {}
}
```

Action FAILED event

When an action execution fails, it emits an event that sends notifications with the following content. This example is for the pipeline named "myPipeline" in the us-west-2 Region, for the action "Deploy".

Emitted event

```
{
    "version": "0",
    "id": "01234567-EXAMPLE",
    "detail-type": "CodePipeline Action Execution State Change",
    "source": "aws.codepipeline",
    "account": "123456789012",
    "time": "2020-01-31T18:55:43Z",
    "region": "us-west-2",
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "start-time": "2023-10-26T13:51:09.9812",
    ]
```

```
"stage": "Deploy",
        "execution-result": {
            "external-execution-url": "https://us-west-2.console.aws.amazon.com/
codedeploy/home?#/deployments/<ID>",
            "external-execution-summary": "Deployment <ID> failed",
            "external-execution-id": "<ID>",
            "error-code": "JobFailed"
        },
        "action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
        "action": "Deploy",
        "state": "FAILED",
        "region": "us-west-2",
        "type": {
            "owner": "AWS",
            "provider": "CodeDeploy",
            "category": "Deploy",
            "version": "1"
        },
        "version": 4.0,
        "pipeline-execution-attempt": 1.0
    }
}
```

```
{
    "account": "123456789012",
    "detailType": "CodePipeline Action Execution State Change",
    "region": "us-west-2",
    "source": "aws.codepipeline",
    "time": "2021-06-24T00:46:16Z",
    "notificationRuleArn": "arn:aws:codestar-notifications:us-
west-2:123456789012:notificationrule/a69c62c21EXAMPLE",
    "detail": {
        "pipeline": "myPipeline",
        "execution-id": "12345678-1234-5678-abcd-12345678abcd",
        "stage": "Deploy",
        "execution-result": {
            "external-execution-url": "https://console.aws.amazon.com/codedeploy/
home?region=us-west-2#/deployments/<ID>",
            "external-execution-summary": "Deployment <ID> failed",
            "external-execution-id": "<ID>",
            "error-code": "JobFailed"
```

```
},
        "action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
        "action": "Deploy",
        "state": "FAILED",
        "region": "us-west-2",
        "type": {
            "owner": "AWS",
            "provider": "CodeDeploy",
            "category": "Deploy",
            "version": "1"
        },
        "version": 13.0,
        "pipeline-execution-attempt": 1.0
    },
    "resources": [
        "arn:aws:codepipeline:us-west-2:123456789012:myPipeline"
    ],
    "additionalAttributes": {
        "additionalInformation": "Deployment <ID> failed"
    }
}
```

Action ABANDONED event

When an action execution is abandoned, it emits an event that sends notifications with the following content. This example is for the pipeline named "myPipeline" in the us-west-2 Region, for the action "Deploy".

```
"stage": "Deploy",
"action-execution-id": "47f821c5-a902-44b2-ae61-b878d31ecd21",
"action": "Deploy",
"state": "ABANDONED",
"region": "us-west-2",
"type": {
        "owner": "AWS",
        "provider": "CodeDeploy",
        "category": "Deploy",
        "version": "1"
      },
      "version": 3.0,
      "pipeline-execution-attempt": 1.0
   }
}
```

Create a Rule That Sends a Notification on a Pipeline Event

A rule watches for certain events and then routes them to Amazon targets that you choose. You can create a rule that performs an Amazon action automatically when another Amazon action happens, or a rule that performs an Amazon action regularly on a set schedule.

Topics

- Send a Notification When Pipeline State Changes (Console)
- Send a Notification When Pipeline State Changes (CLI)

Send a Notification When Pipeline State Changes (Console)

These steps show how to use the EventBridge console to create a rule to send notifications of changes in CodePipeline.

To create an EventBridge rule that targets your pipeline with an Amazon S3 source

- 1. Open the Amazon EventBridge console at https://console.amazonaws.cn/events/.
- In the navigation pane, choose Rules. Leave the default bus selected or choose an event bus. Choose Create rule.
- 3. In Name, enter a name for your rule.
- 4. Under Rule type, choose Rule with an event pattern. Choose Next.
- 5. Under **Event pattern**, choose **Amazon services**.

- 6. From the **Event Type** drop-down list, choose the level of state change for the notification.
 - For a rule that applies to pipeline-level events, choose CodePipeline Pipeline Execution State Change.
 - For a rule that applies to stage-level events, choose **CodePipeline Stage Execution State Change**.
 - For a rule that applies to action-level events, choose CodePipeline Action Execution State Change.
- 7. Specify the state changes the rule applies to:
 - For a rule that applies to all state changes, choose **Any state**.
 - For a rule that applies to some state changes only, choose **Specific state(s)**, and then choose one or more state values from the list.
- 8. For event patterns that are more detailed than the selectors allow, you can also use the **Edit pattern** option in the **Event pattern** window to designate an event pattern in JSON format.

```
Note
```

If not otherwise specified, then the event pattern is created for all pipelines/stages/ actions and states.

For more detailed event patterns, you can copy and paste the following example event patterns into the **Event pattern** window.

• Example

Use this sample event pattern to capture failed deploy and build actions across all the pipelines.

```
{
   "source": [
     "aws.codepipeline"
 ],
   "detail-type": [
     "CodePipeline Action Execution State Change"
 ],
   "detail": {
     "state": [
```

```
User Guide
```

```
"FAILED"
],
"type": {
    "category": ["Deploy", "Build"]
  }
}
```

• Example

Use this sample event pattern to capture all rejected or failed approval actions across all the pipelines.

```
{
 "source": [
    "aws.codepipeline"
  ],
  "detail-type": [
    "CodePipeline Action Execution State Change"
  ],
  "detail": {
    "state": [
      "FAILED"
    ],
    "type": {
      "category": ["Approval"]
    }
  }
}
```

• Example

Use this sample event pattern to capture all the events from the specified pipelines.

```
{
    "source": [
        "aws.codepipeline"
    ],
    "detail-type": [
        "CodePipeline Pipeline Execution State Change",
        "CodePipeline Action Execution State Change",
        "CodePipeline Stage Execution State Change"
```

```
"detail": {
    "pipeline": ["myPipeline", "my2ndPipeline"]
}
```

- 9. Choose Next.
- 10. In Target types, choose Amazon service.
- 11. In **Select a target**, choose **CodePipeline**. In **Pipeline ARN**, enter the pipeline ARN for the pipeline to be started by this rule.

🚯 Note

To get the pipeline ARN, run the **get-pipeline** command. The pipeline ARN appears in the output. It is constructed in this format: arn:aws:codepipeline:*region:account:pipeline-name* Sample pipeline ARN: arn:aws:codepipeline:us-east-2:80398EXAMPLE:MyFirstPipeline

- 12. To create or specify an IAM service role that grants EventBridge permissions to invoke the target associated with your EventBridge rule (in this case, the target is CodePipeline):
 - Choose **Create a new role for this specific resource** to create a service role that gives EventBridge permissions to your start your pipeline executions.
 - Choose Use existing role to enter a service role that gives EventBridge permissions to your start your pipeline executions.
- 13. Choose Next.
- 14. On the **Tags** page, choose **Next**.
- 15. On the **Review and create** page, review the rule configuration. If you're satisfied with the rule, choose **Create rule**.

Send a Notification When Pipeline State Changes (CLI)

These steps show how to use the CLI to create an CloudWatch Events rule to send notifications of changes in CodePipeline.

To use the Amazon CLI to create a rule, call the **put-rule** command, specifying:

- A name that uniquely identifies the rule you are creating. This name must be unique across all of the pipelines you create with CodePipeline associated with your Amazon account.
- The event pattern for the source and detail fields used by the rule. For more information, see <u>Amazon EventBridge and Event Patterns</u>.

To create an EventBridge rule with CodePipeline as the event source

1. Call the **put-rule** command to create a rule specifying the event pattern. (See the preceding tables for valid states.)

The following sample command uses --event-pattern to create a rule called "MyPipelineStateChanges" that emits the CloudWatch event when a pipeline execution fails for the pipeline named "myPipeline."

aws events put-rule --name "MyPipelineStateChanges" --event-pattern "{\"source\": [\"aws.codepipeline\"],\"detail-type\":[\"CodePipeline Pipeline Execution State Change\"],\"detail\":{\"pipeline\":[\"myPipeline\"],\"state\":[\"FAILED\"]}}"

- 2. Call the **put-targets** command and include the following parameters:
 - The --rule parameter is used with the rule_name you created by using **put-rule**.
 - The --targets parameter is used with the list Id of the target in the list of targets and the ARN of the Amazon SNS topic.

The following sample command specifies that for the rule called MyPipelineStateChanges, the target Id is composed of the number one, indicating that in a list of targets for the rule, this is target 1. The sample command also specifies an example ARN for the Amazon SNS topic.

```
aws events put-targets --rule MyPipelineStateChanges --targets
Id=1,Arn=arn:aws:sns:us-west-2:11111EXAMPLE:MyNotificationTopic
```

3. Add permissions for EventBridge to use the designated target service to invoke the notification. For more information, see Using resource-based policies for Amazon EventBridge.

Events placeholder bucket reference

This section is a reference only. For information about creating a pipeline with event detection resources, see Source actions and change detection methods.

Source actions provided by Amazon S3 and CodeCommit use event-based change detection resources to trigger your pipeline when a change is made in the source bucket or repository. These resources are the CloudWatch Events rules that are configured to respond to events in the pipeline source, such as a code change to the CodeCommit repository. When you use CloudWatch Events for an Amazon S3 source, you must turn on CloudTrail so the events are logged. CloudTrail requires an S3 bucket where it can send its digests. You can access the log files for your CloudWatch Events resources from the custom bucket, but you cannot access the data from the placeholder bucket.

- If you used the CLI or Amazon CloudFormation to set up the CloudWatch Events resources, you can find your CloudTrail files in the bucket that you specified when you set up your pipeline.
- If you used the console to set up your pipeline with an S3 source, the console uses a CloudTrail
 placeholder bucket when it creates your CloudWatch Events resources for you. CloudTrail digests
 are stored in the placeholder bucket in the Amazon Web Services Region where the pipeline is
 created.

You can change the configuration if you want to use a bucket other than the placeholder bucket.

1 Note

Data written to CloudTrail placeholder buckets automatically expires after one day and is not retained.

For more information about finding and managing your CloudTrail log files, see <u>Getting and</u> <u>Viewing Your CloudTrail Log Files</u>.

Topics

Events placeholder bucket names by Region

Events placeholder bucket names by Region

This table lists the names of the S3 placeholder buckets that contain log files that track change detection events for pipelines with Amazon S3 source actions.

Note: The placeholder bucket name for the China (Beijing) Region is codepipeline-cloudtrailplaceholder-bucket-cn-north-1 for the Region identifier of cn-north-1. The placeholder bucket name for the China (Ningxia) Region is codepipeline-cloudtrail-placeholder-bucket-cn-northwest-1 for the Region identifier cn-northwest-1.

Logging CodePipeline API calls with Amazon CloudTrail

Amazon CodePipeline is integrated with Amazon CloudTrail, a service that provides a record of actions taken by a user, role, or an Amazon Web Services service in CodePipeline;. CloudTrail captures all API calls for CodePipeline as events. The calls captured include calls from the CodePipeline console and code calls to the CodePipeline API operations. If you create a trail, you can enable continuous delivery of CloudTrail events to an Amazon S3 bucket, including events for CodePipeline. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in **Event history**. Using the information collected by CloudTrail, you can determine the request that was made to CodePipeline, the IP address from which the request was made, who made the request, when it was made, and additional details.

To learn more about CloudTrail, see the <u>Amazon CloudTrail User Guide</u>.

CodePipeline information in CloudTrail

CloudTrail is enabled on your Amazon Web Services account when you create the account. When activity occurs in CodePipeline, that activity is recorded in a CloudTrail event along with other Amazon Web Services service events in **Event history**. You can view, search, and download recent events in your Amazon account. For more information, see <u>Viewing Events with CloudTrail Event History</u>.

For an ongoing record of events in your Amazon Web Services account , including events for CodePipeline, create a trail. A *trail* enables CloudTrail to deliver log files to an Amazon S3 bucket. By default, when you create a trail in the console, the trail applies to all Amazon Regions. The trail logs events from all Regions in the Amazon partition and delivers the log files to the Amazon S3 bucket that you specify. Additionally, you can configure other Amazon Web Services services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see the following:

- Overview for Creating a Trail
- CloudTrail Supported Services and Integrations
- Configuring Amazon SNS Notifications for CloudTrail
- <u>Receiving CloudTrail Log Files from Multiple Regions</u> and <u>Receiving CloudTrail Log Files from</u> <u>Multiple Accounts</u>

All CodePipeline actions are logged by CloudTrail and are documented in the <u>CodePipeline</u> <u>API Reference</u>. For example, calls to the CreatePipeline, GetPipelineExecution and UpdatePipeline actions generate entries in the CloudTrail log files.

Every event or log entry contains information about who generated the request. The identity information helps you determine the following:

- Whether the request was made with root or Amazon Identity and Access Management (IAM) credentials.
- Whether the request was made with temporary security credentials for a role or federated user.
- Whether the request was made by another Amazon Web Services service.

For more information, see the <u>CloudTrail userIdentity Element</u>.

Understanding CodePipeline log file entries

A trail is a configuration that enables delivery of events as log files to an Amazon S3 bucket that you specify. CloudTrail log files contain one or more log entries. An event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files aren't an ordered stack trace of the public API calls, so they don't appear in any specific order.

The following example shows a CloudTrail log entry for an update pipeline event, where a pipeline named MyFirstPipeline has been edited by the user named JaneDoe-CodePipeline with the account ID 80398EXAMPLE. The user changed the name of the source stage of a pipeline from Source to MySourceStage. Because both the requestParameters and the responseElements elements in the CloudTrail log contain the entire structure of the edited pipeline, those elements have been

abbreviated in the following example. **Emphasis** has been added to the requestParameters portion of the pipeline where the change occurred, the previous version number of the pipeline, and the responseElements portion, which shows the version number incremented by 1. Edited portions are marked with ellipses (...) to illustrate where more data appears in a real log entry.

```
{
 "eventVersion":"1.03",
  "userIdentity": {
  "type":"IAMUser",
  "principalId":"AKIAI44QH8DHBEXAMPLE",
   "arn":"arn:aws:iam::80398EXAMPLE:user/JaneDoe-CodePipeline",
  "accountId": "80398EXAMPLE",
  "accessKeyId":"AKIAIOSFODNN7EXAMPLE",
   "userName":"JaneDoe-CodePipeline",
  "sessionContext": {
  "attributes":{
    "mfaAuthenticated":"false",
    "creationDate":"2015-06-17T14:44:03Z"
   }
  },
 "invokedBy":"signin.amazonaws.com"},
 "eventTime":"2015-06-17T19:12:20Z",
 "eventSource": "codepipeline.amazonaws.com",
 "eventName": "UpdatePipeline",
"awsRegion":"us-east-2",
 "sourceIPAddress":"192.0.2.64",
 "userAgent":"signin.amazonaws.com",
"requestParameters":{
   "pipeline":{
  "version":1,
   "roleArn":"arn:aws:iam::80398EXAMPLE:role/CodePipeline_Service_Role",
  "name":"MyFirstPipeline",
  "stages":[
     {
     "actions":[
      {
          "name": "MySourceStage",
        "actionType":{
        "owner":"AWS",
        "version":"1",
        "category":"Source",
        "provider":"S3"
     },
```

```
"inputArtifacts":[],
    "outputArtifacts":[
     {"name":"MyApp"}
     ],
    "runOrder":1,
    "configuration":{
     "S3Bucket": "amzn-s3-demo-source-bucket",
     "S3ObjectKey":"sampleapp_linux.zip"
      }
      }
     ],
       "name":"Source"
     },
     (...)
               },
 "responseElements":{
   "pipeline":{
     "version":2,
     (...)
           },
     "requestID":"2c4af5c9-7ce8-EXAMPLE",
     "eventID":""c53dbd42-This-Is-An-Example"",
     "eventType":"AwsApiCall",
     "recipientAccountId":"80398EXAMPLE"
     }
      ]
}
```

CodePipeline CloudWatch metrics

You can use metrics in CloudWatch to measure CodePipeline pipelines. You can use the following metrics to measure pipeline duration and failed pipeline executions.

You can monitor your pipelines at two levels:

Pipeline level

These metrics are at the pipeline level. Choose **By Pipeline** in CloudWatch. Available pipelines will be listed in CloudWatch.

Amazon account level

These metrics are for all pipelines in an account. To see metrics at the Amazon account level, choose **Account Metrics** in CloudWatch.

For more information about viewing metrics, see <u>View available metrics</u> in the *Amazon CloudWatch User Guide*.

Topics

- PipelineDuration
- FailedPipelineExecutions

PipelineDuration

The PipelineDuration metric measures the duration of the pipeline execution. This metric is available for the pipeline level only.

Units: Seconds

FailedPipelineExecutions

The FailedPipelineExecutions metric measures the number of pipeline executions that failed. This metric is available at the pipeline level and the account level.

This metric includes a separate count for pipeline executions with a retry of a failed action. In other words, when a failed action is retried in a pipeline, this will count as a separate pipeline execution metric. For example, for a pipeline with an S3 source action where the S3 source action fails the first time, that makes one execution, and then the source action is retried and fails again. For this example, the metric will be the following:

FailedPipelineExecutionAttempts: 2

Units: Count

Troubleshooting CodePipeline

The following information might help you troubleshoot common issues in Amazon CodePipeline.

Topics

- Pipeline error: A pipeline configured with Amazon Elastic Beanstalk returns an error message: "Deployment failed. The provided role does not have sufficient permissions: Service:AmazonElasticLoadBalancing"
- <u>Deployment error: A pipeline configured with an Amazon Elastic Beanstalk deploy action hangs</u> instead of failing if the "DescribeEvents" permission is missing
- Pipeline error: A source action returns the insufficient permissions message: "Could not access the CodeCommit repository repository-name. Make sure that the pipeline IAM role has sufficient permissions to access the repository."
- Pipeline error: A Jenkins build or test action runs for a long time and then fails due to lack of credentials or permissions
- <u>Pipeline error: A pipeline created in one Amazon Region using a bucket created in another</u> <u>Amazon Region returns an "InternalError" with the code "JobFailed"</u>
- Deployment error: A ZIP file that contains a WAR file is deployed successfully to Amazon Elastic Beanstalk, but the application URL reports a 404 not found error
- Pipeline artifact folder names appear to be truncated
- <u>Add CodeBuild GitClone permissions for connections to Bitbucket, GitHub, GitHub Enterprise</u> Server, or GitLab.com
- Add CodeBuild GitClone permissions for CodeCommit source actions
- Pipeline error: A deployment with the CodeDeployToECS action returns an error message: "Exception while trying to read the task definition artifact file from: <source artifact name>"
- GitHub (via OAuth app) source action: Repository list shows different repositories
- GitHub (via GitHub App) source action: Unable to complete the connection for a repository
- Amazon S3 error: CodePipeline service role <ARN> is getting S3 access denied for the S3 bucket <BucketName>
- Pipelines with an Amazon S3, Amazon ECR, or CodeCommit source no longer start automatically
- <u>Connections error when connecting to GitHub: "A problem occurred, make sure cookies are</u> enabled in your browser" or "An organization owner must install the GitHub app"

- <u>Pipelines with execution mode changed to QUEUED or PARALLEL mode fails when run limit</u> reached
- <u>Pipelines in PARALLEL mode have an outdated pipeline definition if edited when changing to</u> <u>QUEUED or SUPERSEDED mode</u>
- Pipelines changed from PARALLEL mode will display a previous execution mode
- <u>Pipelines with connections that use trigger filtering by file paths might not start at branch</u> <u>creation</u>
- <u>Pipelines with connections that use trigger filtering by file paths might not start when file limit is</u> <u>reached</u>
- <u>CodeCommit or S3 source revisions in PARALLEL mode might not match EventBridge event</u>
- EC2 Deploy action fails with an error message No such file
- EKS Deploy action fails with a cluster unreachable error message
- <u>Need help with a different issue?</u>

Pipeline error: A pipeline configured with Amazon Elastic Beanstalk returns an error message: "Deployment failed. The provided role does not have sufficient permissions: Service:AmazonElasticLoadBalancing"

Problem: The service role for CodePipeline does not have sufficient permissions for Amazon Elastic Beanstalk, including, but not limited to, some operations in Elastic Load Balancing. The service role for CodePipeline was updated on August 6, 2015 to address this issue. Customers who created their service role before this date must modify the policy statement for their service role to add the required permissions.

Possible fixes: The easiest solution is to edit the policy statement for your service role as detailed in <u>Add permissions to the CodePipeline service role</u>.

After you apply the edited policy, follow the steps in <u>Start a pipeline manually</u> to manually rerun any pipelines that use Elastic Beanstalk.

Depending on your security needs, you can modify the permissions in other ways, too.

Deployment error: A pipeline configured with an Amazon Elastic Beanstalk deploy action hangs instead of failing if the "DescribeEvents" permission is missing

Problem: The service role for CodePipeline must include the

"elasticbeanstalk:DescribeEvents" action for any pipelines that use Amazon Elastic Beanstalk. Without this permission, Amazon Elastic Beanstalk deploy actions hang without failing or indicating an error. If this action is missing from your service role, then CodePipeline does not have permissions to run the pipeline deployment stage in Amazon Elastic Beanstalk on your behalf.

Possible fixes: Review your CodePipeline service role. If the

"elasticbeanstalk:DescribeEvents" action is missing, use the steps in <u>Add permissions to</u> <u>the CodePipeline service role</u> to add it using the **Edit Policy** feature in the IAM console.

After you apply the edited policy, follow the steps in <u>Start a pipeline manually</u> to manually rerun any pipelines that use Elastic Beanstalk.

Pipeline error: A source action returns the insufficient permissions message: "Could not access the CodeCommit repository repository-name. Make sure that the pipeline IAM role has sufficient permissions to access the repository."

Problem: The service role for CodePipeline does not have sufficient permissions for CodeCommit and likely was created before support for using CodeCommit repositories was added on April 18, 2016. Customers who created their service role before this date must modify the policy statement for their service role to add the required permissions.

Possible fixes: Add the required permissions for CodeCommit to your CodePipeline service role's policy. For more information, see <u>Add permissions to the CodePipeline service role</u>.

Pipeline error: A Jenkins build or test action runs for a long time and then fails due to lack of credentials or permissions

Problem: If the Jenkins server is installed on an Amazon EC2 instance, the instance might not have been created with an instance role that has the permissions required for CodePipeline. If you are

using an IAM user on a Jenkins server, an on-premises instance, or an Amazon EC2 instance created without the required IAM role, the IAM user either does not have the required permissions, or the Jenkins server cannot access those credentials through the profile configured on the server.

Possible fixes: Make sure that Amazon EC2 instance role or IAM user is configured with the AWSCodePipelineCustomActionAccess managed policy or with the equivalent permissions. For more information, see <u>Amazon managed policies for Amazon CodePipeline</u>.

If you are using an IAM user, make sure the Amazon profile configured on the instance uses the IAM user configured with the correct permissions. You might have to provide the IAM user credentials you configured for integration between Jenkins and CodePipeline directly into the Jenkins UI. This is not a recommended best practice. If you must do so, be sure the Jenkins server is secured and uses HTTPS instead of HTTP.

Pipeline error: A pipeline created in one Amazon Region using a bucket created in another Amazon Region returns an "InternalError" with the code "JobFailed"

Problem: The download of an artifact stored in an Amazon S3 bucket will fail if the pipeline and bucket are created in different Amazon Regions.

Possible fixes: Make sure the Amazon S3 bucket where your artifact is stored is in the same Amazon Region as the pipeline you have created.

Deployment error: A ZIP file that contains a WAR file is deployed successfully to Amazon Elastic Beanstalk, but the application URL reports a 404 not found error

Problem: A WAR file is deployed successfully to an Amazon Elastic Beanstalk environment, but the application URL returns a 404 Not Found error.

Possible fixes: Amazon Elastic Beanstalk can unpack a ZIP file, but not a WAR file contained in a ZIP file. Instead of specifying a WAR file in your buildspec.yml file, specify a folder that contains the content to be deployed. For example:

```
version: 0.2
```

Pipeline error: A pipeline created in one Amazon Region using a bucket created in another Amazon Region returns an "InternalError" with the code "JobFailed"

```
phases:
    post_build:
        commands:
        - mvn package
        - mv target/my-web-app ./
artifacts:
    files:
        - my-web-app/**/*
discard-paths: yes
```

For an example, see <u>Amazon Elastic Beanstalk Sample for CodeBuild</u>.

Pipeline artifact folder names appear to be truncated

Problem: When you view pipeline artifact names in CodePipeline, the names appear to be truncated. This can make the names appear to be similar or seem to no longer contain the entire pipeline name.

Explanation: CodePipeline truncates artifact names to ensure that the full Amazon S3 path does not exceed policy size limits when CodePipeline generates temporary credentials for job workers.

Even though the artifact name appears to be truncated, CodePipeline maps to the artifact bucket in a way that is not affected by artifacts with truncated names. The pipeline can function normally. This is not an issue with the folder or artifacts. There is a 100-character limit to pipeline names. Although the artifact folder name might appear to be shortened, it is still unique for your pipeline.

Add CodeBuild GitClone permissions for connections to Bitbucket, GitHub, GitHub Enterprise Server, or GitLab.com

When you use an AWS CodeStar connection in a source action and a CodeBuild action, there are two ways the input artifact can be passed to the build:

- The default: The source action produces a zip file that contains the code that CodeBuild downloads.
- Git clone: The source code can be directly downloaded to the build environment.

The Git clone mode allows you to interact with the source code as a working Git repository. To use this mode, you must grant your CodeBuild environment permissions to use the connection.

To add permissions to your CodeBuild service role policy, you create a customer-managed policy that you attach to your CodeBuild service role. The following steps create a policy where the UseConnection permission is specified in the action field, and the connection ARN is specified in the Resource field.

To use the console to add the UseConnection permissions

1. To find the connection ARN for your pipeline, open your pipeline and click the (i) icon on your source action. You add the connection ARN to your CodeBuild service role policy.

An example connection ARN is:

```
arn:aws:codeconnections:eu-central-1:123456789123:connection/
sample-1908-4932-9ecc-2ddacee15095
```

- 2. To find your CodeBuild service role, open the build project used in your pipeline and navigate to the **Build details** tab.
- 3. Choose the **Service role** link. This opens the IAM console where you can add a new policy that grants access to your connection.
- 4. In the IAM console, choose **Attach policies**, and then choose **Create policy**.

Use the following sample policy template. Add your connection ARN in the Resource field, as shown in this example:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codestar-connections:UseConnection",
            "Resource": "insert connection ARN here"
        }
    ]
}
```

On the **JSON** tab, paste your policy.

5. Choose **Review policy**. Enter a name for the policy (for example, **connection-permissions**), and then choose **Create policy**.

6. Return to the page where you were attaching permissions, refresh the policy list, and select the policy you just created. Choose **Attach policies**.

		Permis	SSIONS		C
Filte	er po	licies ~	Q connection		Showing 1 result
		Policy n	ame 👻	Туре	Used as
	•	conr	nection-permissions	Customer managed	None

Add CodeBuild GitClone permissions for CodeCommit source actions

When your pipeline has a CodeCommit source action, there are two ways you can pass the input artifact to the build:

- **Default** The source action produces a zip file that contains the code that CodeBuild downloads.
- Full clone The source code can be directly downloaded to the build environment.

The **Full clone** option allows you to interact with the source code as a working Git repository. To use this mode, you must add permissions for your CodeBuild environment to pull from your repository.

To add permissions to your CodeBuild service role policy, you create a customer-managed policy that you attach to your CodeBuild service role. The following steps create a policy that specifies the codecommit:GitPull permission in the action field.

To use the console to add the GitPull permissions

- 1. To find your CodeBuild service role, open the build project used in your pipeline and navigate to the **Build details** tab.
- 2. Choose the **Service role** link. This opens the IAM console where you can add a new policy that grants access to your repository.
- 3. In the IAM console, choose **Attach policies**, and then choose **Create policy**.
- 4. On the **JSON** tab, paste the following sample policy.

```
User Guide
```

```
{
    "Action": [
        "codecommit:GitPull"
    ],
    "Resource": "*",
    "Effect": "Allow"
},
```

- 5. Choose **Review policy**. Enter a name for the policy (for example, **codecommit-gitpull**), and then choose **Create policy**.
- 6. Return to the page where you were attaching permissions, refresh the policy list, and select the policy you just created. Choose **Attach policies**.

Pipeline error: A deployment with the CodeDeployToECS action returns an error message: "Exception while trying to read the task definition artifact file from: <source artifact name>"

Problem:

The task definition file is a required artifact for the CodePipeline deploy action to Amazon ECS through CodeDeploy (the CodeDeployToECS action). The maximum artifact ZIP size in the CodeDeployToECS deploy action is 3 MB. The following error message is returned when the file is not found or the artifact size exceeds 3 MB:

Exception while trying to read the task definition artifact file from: <source artifact name>

Possible fixes: Make sure the task definition file is included as an artifact. If the file already exists, makes sure the compressed size is less than 3 MB.

GitHub (via OAuth app) source action: Repository list shows different repositories

Problem:

After a successful authorization for a GitHub (via OAuth app) action in the CodePipeline console, you can choose from a list of your GitHub repositories. If the list does not include the repositories you expected to see, then you can troubleshoot the account used for authorization.

Possible fixes: The list of repositories provided in the CodePipeline console are based on the GitHub organization the authorized account belongs to. Verify that the account you are using to authorize with GitHub is the account associated with the GitHub organization where your repository is created.

GitHub (via GitHub App) source action: Unable to complete the connection for a repository

Problem:

Because a connection to a GitHub repository uses the Amazon Connector for GitHub, you need organization owner permissions or admin permissions to the repository to create the connection.

Possible fixes: For information about permission levels for a GitHub repository, see https://docs.github.com/en/free-pro-team@latest/github/setting-up-and-managing-organizations-and-teams/permission-levels-for-an-organization.

Amazon S3 error: CodePipeline service role <ARN> is getting S3 access denied for the S3 bucket <BucketName>

Problem:

While in progress, the CodeCommit action in CodePipeline checks that the pipeline artifact bucket exists. If the action does not have permission to check, an AccessDenied error occurs in Amazon S3 and the following error message displays in CodePipeline:

CodePipeline service role "arn:aws:iam::*AccountID*:role/service-role/*RoleID*" is getting S3 access denied for the S3 bucket "*BucketName*"

The CloudTrail logs for the action also log the AccessDenied error.

Possible fixes: Do the following:

For the policy attached to your CodePipeline service role, add s3:ListBucket to the list of actions in your policy. For instructions on to view your service role policy, see <u>View the pipeline</u> <u>ARN and service role ARN (console)</u>. Edit the policy statement for your service role as detailed in Add permissions to the CodePipeline service role.

 For the resource-based policy attached to the Amazon S3 artifact bucket for your pipeline, also called the *artifact bucket policy*, add a statement to allow the s3:ListBucket permission to be used by your CodePipeline service role.

To add your policy to the artifact bucket

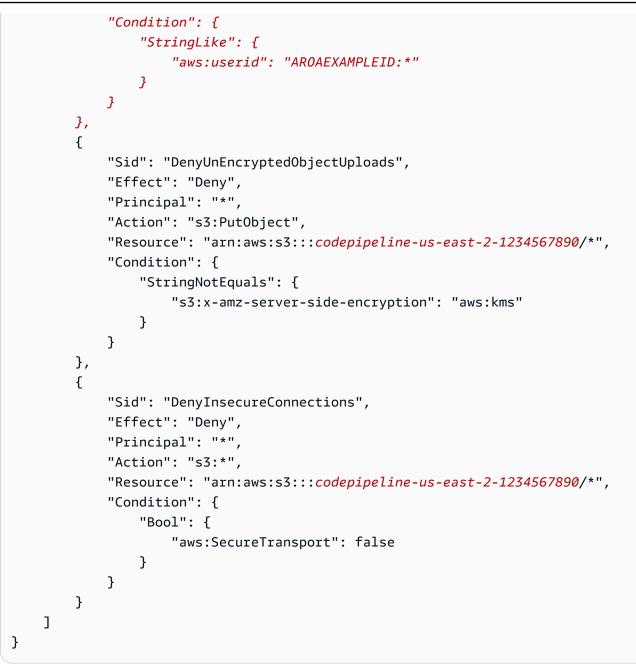
- 1. Follow the steps in <u>View the pipeline ARN and service role ARN (console)</u> to choose your artifact bucket on the pipeline **Settings** page and then view it in the Amazon S3 console.
- 2. Choose **Permissions**.
- 3. Under Bucket policy, choose Edit.
- 4. In the **Policy** text field, enter a new bucket policy, or edit the existing policy as shown in the following example. The bucket policy is a JSON file, so you must enter valid JSON.

The following example shows a bucket policy statement for an artifact bucket where the example role ID for the service role is *AROAEXAMPLEID*.

```
{
    "Effect": "Allow",
    "Principal": "*",
    "Action": "s3:ListBucket",
    "Resource": "arn:aws:s3:::BucketName",
    "Condition": {
        "StringLike": {
            "aws:userid": "AROAEXAMPLEID:*"
        }
    }
}
```

The following example shows the same bucket policy statement after the permission is added.

```
{
    "Version": "2012-10-17",
    "Id": "SSEAndSSLPolicy",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": "*",
            "Action": "s3:ListBucket",
            "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890",
```



For more information, see the steps in <u>https://aws.amazon.com/blogs/security/writing-iam-</u>policies-how-to-grant-access-to-an-amazon-s3-bucket/.

5. Choose Save.

After you apply the edited policy, follow the steps in <u>Start a pipeline manually</u> to manually rerun your pipeline.

Pipelines with an Amazon S3, Amazon ECR, or CodeCommit source no longer start automatically

Problem:

After making a change to configuration settings for an action that uses event rules (EventBridge or CloudWatch Events) for change detection, the console might not detect a change where source trigger identifiers are similar and have identical initial characters. Because the new event rule is not created by the console, the pipeline no longer starts automatically.

An example of a minor change at the end of the parameter name for CodeCommit would be changing your CodeCommit branch name MyTestBranch-1 to MyTestBranch-2. Because the change is at the end of the branch name, the event rule for the source action might not update or create a rule for the new source settings.

Source action	Parameters / trigger identifiers (console)
Amazon ECR	Repository name
	Image tag
Amazon S3	Bucket
	S3 object key
CodeCommit	Repository name
	Branch name

This applies to source actions that use CWE events for change detection as follows:

Possible fixes:

Do one of the following:

• Change the CodeCommit/S3/ECR configuration settings so that changes are made to the starting portion of the parameter value.

Example: Change your branch name release-branch to 2nd-release-branch. Avoid a change at the end of the name, such as release-branch-2.

• Change the CodeCommit/S3/ECR configuration settings for each pipeline.

Example: Change your branch name myRepo/myBranch to myDeployRepo/myDeployBranch. Avoid a change at the end of the name, such as myRepo/myBranch2.

 Instead of the console, use the CLI or Amazon CloudFormation to create and update your change-detection event rules. For instructions on creating event rules for an S3 source action, see <u>Connecting to Amazon S3 source actions that use EventBridge and Amazon CloudTrail</u>. For instructions on creating event rules for an Amazon ECR action, see <u>Amazon ECR source actions</u> <u>and EventBridge resources</u>. For instructions on creating event rules for a CodeCommit action, see <u>CodeCommit source actions and EventBridge</u>.

After you edit your action configuration in the console, accept the updated change-detection resources created by the console.

Connections error when connecting to GitHub: "A problem occurred, make sure cookies are enabled in your browser" or "An organization owner must install the GitHub app"

Problem:

To create the connection for a GitHub source action in CodePipeline, you must be the GitHub organization owner. For repositories that are not under an organization, you must be the repository owner. When a connection is created by someone other than the organization owner, a request is created for the organization owner, and one of the following errors display:

A problem occurred, make sure cookies are enabled in your browser

OR

An organization owner must install the GitHub app

Possible fixes: For repositories in a GitHub organization, the organization owner must create the connection to the GitHub repository. For repositories that are not under an organization, you must be the repository owner.

Pipelines with execution mode changed to QUEUED or PARALLEL mode fails when run limit reached

Problem: The maximum number of concurrent executions for a pipeline in QUEUED mode is 50 executions. When this limit is reached, the pipeline fails without a status message.

Possible fixes: When editing the pipeline definition for execution mode, make the edit separately from other edit actions.

For more information about QUEUED or PARALLEL execution mode, see CodePipeline concepts.

Pipelines in PARALLEL mode have an outdated pipeline definition if edited when changing to QUEUED or SUPERSEDED mode

Problem: For pipelines in parallel mode, when editing the pipeline execution mode to QUEUED or SUPERSEDED, the pipeline definition for PARALLEL mode will not be updated. The updated pipeline definition when updating PARALLEL mode is not used in the SUPERSEDED or QUEUED mode

Possible fixes: For pipelines in parallel mode, when editing the pipeline execution mode to QUEUED or SUPERSEDED, avoid updating the pipeline definition at the same time.

For more information about QUEUED or PARALLEL execution mode, see CodePipeline concepts.

Pipelines changed from PARALLEL mode will display a previous execution mode

Problem: For pipelines in PARALLEL mode, when editing the pipeline execution mode to QUEUED or SUPERSEDED, the pipeline state will not display the updated state as PARALLEL. If the pipeline changed from PARALLEL to QUEUED or SUPERSEDED, the state for the pipeline in SUPERSEDED or QUEUED mode will be the last known state in either of those modes. If the pipeline was never run in that mode before, then the state will be empty.

Possible fixes: For pipelines in parallel mode, when editing the pipeline execution mode to QUEUED or SUPERSEDED, note that the execution mode display will not show the PARALLEL state.

For more information about QUEUED or PARALLEL execution mode, see <u>CodePipeline concepts</u>.

Pipelines with connections that use trigger filtering by file paths might not start at branch creation

Description: For pipelines with source actions that use connections, such as a BitBucket source action, you can set up a trigger with a Git configuration that allows you to filter by file paths to start your pipeline. In certain cases, for pipelines with triggers that are filtered on file paths, the pipeline might not start when a branch with a file path filter is first created, since this does not allow the CodeConnections connection to resolve the files that changed. When the Git configuration for the trigger is set up to filter on file paths the pipeline will not start when the branch with the filter has just been created in the source repository, For more information about filtering on file paths, see <u>Add trigger with code push or pull request event types</u>.

Result: For example, pipelines in CodePipeline that have a file path filter on a branch "B" will not be triggered when branch "B" is created. If there are no file path filters, the pipeline will still start.

Pipelines with connections that use trigger filtering by file paths might not start when file limit is reached

Description: For pipelines with source actions that use connections, such as a BitBucket source action, you can set up a trigger with a Git configuration that allows you to filter by file paths to start your pipeline. CodePipeline retrieves up to the first 100 files; therefore, when the Git configuration for the trigger is set up to filter on file paths, the pipeline might not start if there are over 100 files, For more information about filtering on file paths, see <u>Add trigger with code push or pull request event types</u>.

Result: For example, if a diff contains 150 files, CodePipeline looks at the first 100 files (in no particular order) to check against the file path filter specified. If the file that matches the file path filter is not among the 100 files retrieved by CodePipeline, the pipeline will not be invoked.

CodeCommit or S3 source revisions in PARALLEL mode might not match EventBridge event

Description: For pipeline executions in PARALLEL mode, an execution might start with the most recent change, such as the CodeCommit repository commit, that might not be the same as

the change for the EventBridge event. In some cases, where a split second might be between commits or image tags that start the pipeline, when CodePipeline receives the event and starts that execution, another commit or image tag has been pushed, CodePipeline (for example, the CodeCommit action) will clone the HEAD commit at that moment.

Result: For pipelines in PARALLEL mode with a CodeCommit or S3 source, regardless of the change that triggered the pipeline execution, the source action will always clone the HEAD at the time it is started. For example, for a pipeline in PARALLEL mode, a commit is pushed, which starts the pipeline for execution 1, and the second pipeline execution uses the second commit.

EC2 Deploy action fails with an error message No such file

Description: After the EC2 deploy action unzips the artifacts in the target directory on the instances, the action runs the script. If the script is in the target directory but the action is unable to run the script, the action fails on that instance, and the remaining instances fail deployment.

An error similar to the following error messages displays in the logs for a deployment where the target directory is /home/ec2-user/deploy/ and the source repository path is myRepo/postScript.sh.

Instance i-0145a2d3f3EXAMPLE is FAILED on event AFTER_DEPLOY, message: -----ERROR-----chmod: cannot access '/home/ec2-user/deploy/myRepo/postScript.sh': No such file or directory /var/lib/<path>/_script.sh: line 2: /home/ec2-user/deploy/myRepo/postScript.sh: No such file or directory failed to run commands: exit status 127

Executing commands on instances i-0145a2d3f3EXAMPLE, SSM command id <ID>, commands: chmod u+x /home/ec2-user/deploy/script.sh ------ERROR------: No such file or directory

Result: The deployment action fails in the pipeline.

Possible fixes: To troubleshoot, use the following steps.

- 1. View the logs to verify which instance caused the script to fail.
- 2. Change directory (cd) to the target directory on your instance. Test run the script on the instance.

3. In your source repository, edit the script file to remove any comments or commands that might be causing the issue.

EKS Deploy action fails with a cluster unreachable error message

Description: After the EKS deploy action runs, the action fails with a cluster unreachable error message. The message shows an access issue on the cluster due to missing permissions. Based on the type of files (Helm chart or Kubernetes manifest files), the error message displays as follows.

• For an EKS deploy action that is using a Helm chart, an error similar to the following error message displays.

```
error message:
```

```
helm upgrade --install my-release test-chart --wait
Error: Kubernetes cluster unreachable: the server has asked for the client to provide
  credentials
```

• For an EKS deploy action that is using Kubernetes manifest files, an error similar to the following error message displays.

```
kubectl apply -f deployment.yaml
Error: error validating "deployment.yaml": error validating data: failed to download
openapi: the server has asked for the client to provide credentials
```

Result: The deployment action fails in the pipeline.

Possible fixes: If using an existing role, the CodePipeline service role must be updated with the required permissions to use the EKS deploy action. Additionally, to allow the CodePipeline service role access to your cluster, you must add an access entry to your cluster and specify the service role for the access entry.

1. Verify that the CodePipeline service role has the required permissions for the EKS deploy action. For the permissions reference, see Service role policy permissions. 2. Add an access entry to your cluster and specify the CodePipeline service role for the access. For an example, see Step 4: Create an access entry for the CodePipeline service role.

Need help with a different issue?

Try these other resources:

- Contact Amazon Support.
- Ask a question in the CodePipeline forum.
- Request a quota increase. For more information, see Quotas in Amazon CodePipeline.

Note

It can take up to two weeks to process requests for a quota increase.

Security in Amazon CodePipeline

Cloud security at Amazon is the highest priority. As an Amazon customer, you benefit from a data center and network architecture that is built to meet the requirements of the most security-sensitive organizations.

Security is a shared responsibility between Amazon and you. The <u>shared responsibility model</u> describes this as security *of* the cloud and security *in* the cloud:

- Security of the cloud Amazon is responsible for protecting the infrastructure that runs Amazon Web Services services in the Amazon Web Services Cloud. Amazon also provides you with services that you can use securely. Third-party auditors regularly test and verify the effectiveness of our security as part of the <u>Amazon compliance programs</u>. To learn about the compliance programs that apply to Amazon CodePipeline, see <u>Amazon Web Services service in</u> scope by compliance program.
- Security in the cloud Your responsibility is determined by the Amazon Web Services service that you use. You are also responsible for other factors, including the sensitivity of your data, your company's requirements, and applicable laws and regulations.

This documentation helps you understand how to apply the shared responsibility model when using CodePipeline. The following topics show you how to configure CodePipeline to meet your security and compliance objectives. You also learn how to use other Amazon Web Services services that help you to monitor and secure your CodePipeline resources.

Topics

- Data protection in Amazon CodePipeline
- Identity and access management for Amazon CodePipeline
- Logging and monitoring in CodePipeline
- <u>Compliance validation for Amazon CodePipeline</u>
- <u>Resilience in Amazon CodePipeline</u>
- Infrastructure security in Amazon CodePipeline
- Security best practices

Data protection in Amazon CodePipeline

The Amazon <u>shared responsibility model</u> applies to data protection in Amazon CodePipeline. As described in this model, Amazon is responsible for protecting the global infrastructure that runs all of the Amazon Web Services Cloud. You are responsible for maintaining control over your content that is hosted on this infrastructure. You are also responsible for the security configuration and management tasks for the Amazon Web Services services that you use. For more information about data privacy, see the Data Privacy FAQ.

For data protection purposes, we recommend that you protect Amazon Web Services account credentials and set up individual users with Amazon IAM Identity Center or Amazon Identity and Access Management (IAM). That way, each user is given only the permissions necessary to fulfill their job duties. We also recommend that you secure your data in the following ways:

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with Amazon resources. We require TLS 1.2 and recommend TLS 1.3.
- Set up API and user activity logging with Amazon CloudTrail. For information about using CloudTrail trails to capture Amazon activities, see <u>Working with CloudTrail trails</u> in the Amazon CloudTrail User Guide.
- Use Amazon encryption solutions, along with all default security controls within Amazon Web Services services.
- Use advanced managed security services such as Amazon Macie, which assists in discovering and securing sensitive data that is stored in Amazon S3.
- If you require FIPS 140-3 validated cryptographic modules when accessing Amazon through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see Federal Information Processing Standard (FIPS) 140-3.

We strongly recommend that you never put confidential or sensitive information, such as your customers' email addresses, into tags or free-form text fields such as a **Name** field. This includes when you work with CodePipeline or other Amazon Web Services services using the console, API, Amazon CLI, or Amazon SDKs. Any data that you enter into tags or free-form text fields used for names may be used for billing or diagnostic logs. If you provide a URL to an external server, we strongly recommend that you do not include credentials information in the URL to validate your request to that server.

The following security best practices also address data protection in CodePipeline:

- Configure server-side encryption for artifacts stored in Amazon S3 for CodePipeline
- Use Amazon Secrets Manager to track database passwords or third-party API keys

Internetwork traffic privacy

Amazon VPC is an Amazon Web Services service that you can use to launch Amazon resources in a virtual network (*virtual private cloud*) that you define. CodePipeline supports Amazon VPC endpoints powered by Amazon PrivateLink, an Amazon technology that facilitates private communication between Amazon Web Services services using an elastic network interface with private IP addresses. This means you can connect directly to CodePipeline through a private endpoint in your VPC, keeping all traffic inside your VPC and the Amazon network. Previously, applications running inside a VPC required internet access to connect to CodePipeline. With a VPC, you have control over your network settings, such as:

- IP address range,
- Subnets,
- Route tables, and
- Network gateways.

To connect your VPC to CodePipeline, you define an interface VPC endpoint for CodePipeline. This type of endpoint makes it possible for you to connect your VPC to Amazon Web Services services. The endpoint provides reliable, scalable connectivity to CodePipeline without requiring an internet gateway, network address translation (NAT) instance, or VPN connection. For information about setting up a VPC, see the VPC User Guide.

Encryption at rest

Data in CodePipeline is encrypted at rest using Amazon KMS keys. Code artifacts are stored in a customer-owned S3 bucket and encrypted with either the Amazon managed key or a customer managed key. For more information, see <u>Configure server-side encryption for artifacts stored in Amazon S3 for CodePipeline</u>.

Encryption in transit

All service-to-service communication is encrypted in transit using SSL/TLS.

Configure server-side encryption for artifacts stored in Amazon S3 for CodePipeline

There are two ways to configure server-side encryption for Amazon S3 artifacts:

- CodePipeline creates an S3 artifact bucket and default Amazon managed key when you create a pipeline using the Create Pipeline wizard. The Amazon managed key is encrypted along with object data and managed by Amazon.
- You can create and manage your own customer managed key.

🔥 Important

CodePipeline only supports symmetric KMS keys. Do not use an asymmetric KMS key to encrypt the data in your S3 bucket.

If you are using the default S3 key, you cannot change or delete this Amazon managed key. If you are using a customer managed key in Amazon KMS to encrypt or decrypt artifacts in the S3 bucket, you can change or rotate this customer managed key as necessary.

Amazon S3 supports bucket policies that you can use if you require server-side encryption for all objects that are stored in your bucket. For example, the following bucket policy denies upload object (s3:PutObject) permission to everyone if the request does not include the x-amz-server-side-encryption header requesting server-side encryption with SSE-KMS.

```
}
        },
        {
            "Sid": "DenyInsecureConnections",
            "Effect": "Deny",
            "Principal": "*",
            "Action": "s3:*",
            "Resource": "arn:aws:s3:::codepipeline-us-west-2-89050EXAMPLE/*",
            "Condition": {
                "Bool": {
                     "aws:SecureTransport": "false"
                }
            }
        }
    ]
}
```

For more information about server-side encryption and Amazon KMS, see <u>Protecting Data Using</u> <u>Server-Side Encryption</u> and <u>Protecting data using server-side encryption with KMS keys stored in</u> <u>Amazon Key Management Service (SSE-KMS)</u>.

For more information about Amazon KMS, see the <u>Amazon Key Management Service Developer</u> <u>Guide</u>.

Topics

- View your Amazon managed key
- <u>Configure server-side encryption for S3 buckets using Amazon CloudFormation or the Amazon</u>
 <u>CLI</u>

View your Amazon managed key

When you use the **Create Pipeline** wizard to create your first pipeline, an S3 bucket is created for you in the same Region you created the pipeline. The bucket is used to store pipeline artifacts. When a pipeline runs, artifacts are put into and retrieved from the S3 bucket. By default, CodePipeline uses server-side encryption with Amazon KMS using the Amazon managed key for Amazon S3 (the aws/s3 key). This Amazon managed key is created and stored in your Amazon account. When artifacts are retrieved from the S3 bucket, CodePipeline uses the same SSE-KMS process to decrypt the artifact.

To view information about your Amazon managed key

- 1. Sign in to the Amazon Web Services Management Console and open the Amazon KMS console.
- 2. If a welcome page appears, choose **Get started now**.
- 3. In the service navigation pane, choose **Amazon managed keys**.
- 4. Choose the Region for your pipeline. For example, if the pipeline was created in us-east-2, make sure that the filter is set to US East (Ohio).

For more information about the Regions and endpoints available for CodePipeline, see Amazon CodePipeline endpoints and quotas.

5. In the list, choose the key with the alias used for your pipeline (by default, **aws/s3**). Basic information about the key is displayed.

Configure server-side encryption for S3 buckets using Amazon CloudFormation or the Amazon CLI

When you use Amazon CloudFormation or the Amazon CLI to create a pipeline, you must configure server-side encryption manually. Use the sample bucket policy above, and then create your own customer managed key. You can also use your own keys instead of the Amazon managed key. Some reasons to choose your own key include:

- You want to rotate the key on a schedule to meet business or security requirements for your organization.
- You want to create a pipeline that uses resources associated with another Amazon account. This
 requires the use of a customer managed key. For more information, see <u>Create a pipeline in</u>
 <u>CodePipeline that uses resources from another Amazon account.</u>

Cryptographic best practices discourage extensive reuse of encryption keys. As a best practice, rotate your key on a regular basis. To create new cryptographic material for your Amazon KMS keys, you can create a customer managed key, and then change your applications or aliases to use the new customer managed key. Or, you can enable automatic key rotation for an existing customer managed key.

To rotate your customer managed key, see <u>Rotating keys</u>.

<u> Important</u>

CodePipeline only supports symmetric KMS keys. Do not use an asymmetric KMS key to encrypt the data in your S3 bucket.

Use Amazon Secrets Manager to track database passwords or thirdparty API keys

We recommend that you use Amazon Secrets Manager to rotate, manage, and retrieve database credentials, API keys, and other secrets throughout their lifecycle. Secrets Manager enables you to replace hardcoded credentials in your code (including passwords) with an API call to Secrets Manager to retrieve the secret programmatically. For more information, see <u>What Is Amazon</u> <u>Secrets Manager?</u> in the *Amazon Secrets Manager User Guide*.

For pipelines where you pass parameters that are secrets (such as OAuth credentials) in an Amazon CloudFormation template, you should include dynamic references in your template that access the secrets you have stored in Secrets Manager. For the reference ID pattern and examples, see <u>Secrets Manager Secrets</u> in the *Amazon CloudFormation User Guide*. For an example that uses dynamic references in a template snippet for GitHub webhook in a pipeline, see <u>Webhook Resource Configuration</u>.

See also

The following related resources can help you as you work with managing secrets.

- Secrets Manager can rotate database credentials automatically, such as for rotation of Amazon RDS secrets. For more information, see <u>Rotating Your Amazon Secrets Manager Secrets</u> in the *Amazon Secrets Manager User Guide*.
- To view instructions for adding Secrets Manager dynamic references to your Amazon CloudFormation templates, see <u>https://aws.amazon.com/blogs/security/how-to-create-and-</u> retrieve-secrets-managed-in-aws-secrets-manager-using-aws-cloudformation-template/.

Identity and access management for Amazon CodePipeline

Amazon Identity and Access Management (IAM) is an Amazon Web Services service that helps an administrator securely control access to Amazon resources. IAM administrators control who can be

authenticated (signed in) and *authorized* (have permissions) to use CodePipeline resources. IAM is an Amazon Web Services service that you can use with no additional charge.

Topics

- Audience
- Authenticating with identities
- Managing access using policies
- How Amazon CodePipeline works with IAM
- Amazon CodePipeline identity-based policy examples
- Amazon CodePipeline resource-based policy examples
- Troubleshooting Amazon CodePipeline identity and access
- CodePipeline permissions reference
- Manage the CodePipeline service role

Audience

How you use Amazon Identity and Access Management (IAM) differs, depending on the work that you do in CodePipeline.

Service user – If you use the CodePipeline service to do your job, then your administrator provides you with the credentials and permissions that you need. As you use more CodePipeline features to do your work, you might need additional permissions. Understanding how access is managed can help you request the right permissions from your administrator. If you cannot access a feature in CodePipeline, see Troubleshooting Amazon CodePipeline identity and access.

Service administrator – If you're in charge of CodePipeline resources at your company, you probably have full access to CodePipeline. It's your job to determine which CodePipeline features and resources your service users should access. You must then submit requests to your IAM administrator to change the permissions of your service users. Review the information on this page to understand the basic concepts of IAM. To learn more about how your company can use IAM with CodePipeline, see How Amazon CodePipeline works with IAM.

IAM administrator – If you're an IAM administrator, you might want to learn details about how you can write policies to manage access to CodePipeline. To view example CodePipeline identity-based policies that you can use in IAM, see Amazon CodePipeline identity-based policy examples.

Authenticating with identities

Authentication is how you sign in to Amazon using your identity credentials. You must be *authenticated* (signed in to Amazon) as the Amazon Web Services account root user, as an IAM user, or by assuming an IAM role.

If you access Amazon programmatically, Amazon provides a software development kit (SDK) and a command line interface (CLI) to cryptographically sign your requests by using your credentials. If you don't use Amazon tools, you must sign requests yourself. For more information about using the recommended method to sign requests yourself, see <u>Amazon Signature Version 4 for API requests</u> in the *IAM User Guide*.

Regardless of the authentication method that you use, you might be required to provide additional security information. For example, Amazon recommends that you use multi-factor authentication (MFA) to increase the security of your account. To learn more, see <u>Amazon Multi-factor authentication in IAM</u> in the *IAM User Guide*.

Amazon Web Services account root user

When you create an Amazon Web Services account, you begin with one sign-in identity that has complete access to all Amazon Web Services services and resources in the account. This identity is called the Amazon Web Services account *root user* and is accessed by signing in with the email address and password that you used to create the account. We strongly recommend that you don't use the root user for your everyday tasks. Safeguard your root user credentials and use them to perform the tasks that only the root user can perform. For the complete list of tasks that require you to sign in as the root user, see <u>Tasks that require root user credentials</u> in the *IAM User Guide*.

IAM users and groups

An <u>IAM user</u> is an identity within your Amazon Web Services account that has specific permissions for a single person or application. Where possible, we recommend relying on temporary credentials instead of creating IAM users who have long-term credentials such as passwords and access keys. However, if you have specific use cases that require long-term credentials with IAM users, we recommend that you rotate access keys. For more information, see <u>Rotate access keys regularly for</u> <u>use cases that require long-term credentials</u> in the *IAM User Guide*.

An <u>IAM group</u> is an identity that specifies a collection of IAM users. You can't sign in as a group. You can use groups to specify permissions for multiple users at a time. Groups make permissions easier to manage for large sets of users. For example, you could have a group named *IAMAdmins* and give that group permissions to administer IAM resources.

Users are different from roles. A user is uniquely associated with one person or application, but a role is intended to be assumable by anyone who needs it. Users have permanent long-term credentials, but roles provide temporary credentials. To learn more, see <u>Use cases for IAM users</u> in the *IAM User Guide*.

IAM roles

An <u>IAM role</u> is an identity within your Amazon Web Services account that has specific permissions. It is similar to an IAM user, but is not associated with a specific person. To temporarily assume an IAM role in the Amazon Web Services Management Console, you can <u>switch from a user to an IAM</u> <u>role (console)</u>. You can assume a role by calling an Amazon CLI or Amazon API operation or by using a custom URL. For more information about methods for using roles, see <u>Methods to assume a</u> <u>role</u> in the *IAM User Guide*.

IAM roles with temporary credentials are useful in the following situations:

- Federated user access To assign permissions to a federated identity, you create a role and define permissions for the role. When a federated identity authenticates, the identity is associated with the role and is granted the permissions that are defined by the role. For information about roles for federation, see <u>Create a role for a third-party identity provider</u> (federation) in the *IAM User Guide*.
- **Temporary IAM user permissions** An IAM user or role can assume an IAM role to temporarily take on different permissions for a specific task.
- Cross-account access You can use an IAM role to allow someone (a trusted principal) in a different account to access resources in your account. Roles are the primary way to grant cross-account access. However, with some Amazon Web Services services, you can attach a policy directly to a resource (instead of using a role as a proxy). To learn the difference between roles and resource-based policies for cross-account access, see Cross account resource access in IAM in the IAM User Guide.
- **Cross-service access** Some Amazon Web Services services use features in other Amazon Web Services services. For example, when you make a call in a service, it's common for that service to run applications in Amazon EC2 or store objects in Amazon S3. A service might do this using the calling principal's permissions, using a service role, or using a service-linked role.
 - Forward access sessions (FAS) When you use an IAM user or role to perform actions in Amazon, you are considered a principal. When you use some services, you might perform an action that then initiates another action in a different service. FAS uses the permissions of the principal calling an Amazon Web Services service, combined with the requesting Amazon Web

Services service to make requests to downstream services. FAS requests are only made when a service receives a request that requires interactions with other Amazon Web Services services or resources to complete. In this case, you must have permissions to perform both actions. For policy details when making FAS requests, see Forward access sessions.

- Service role A service role is an <u>IAM role</u> that a service assumes to perform actions on your behalf. An IAM administrator can create, modify, and delete a service role from within IAM. For more information, see <u>Create a role to delegate permissions to an Amazon Web Services</u> <u>service</u> in the *IAM User Guide*.
- Service-linked role A service-linked role is a type of service role that is linked to an Amazon Web Services service. The service can assume the role to perform an action on your behalf. Service-linked roles appear in your Amazon Web Services account and are owned by the service. An IAM administrator can view, but not edit the permissions for service-linked roles.
- Applications running on Amazon EC2 You can use an IAM role to manage temporary credentials for applications that are running on an EC2 instance and making Amazon CLI or Amazon API requests. This is preferable to storing access keys within the EC2 instance. To assign an Amazon role to an EC2 instance and make it available to all of its applications, you create an instance profile that is attached to the instance. An instance profile contains the role and enables programs that are running on the EC2 instance to get temporary credentials. For more information, see Use an IAM role to grant permissions to applications running on Amazon EC2 instances in the *IAM User Guide*.

Managing access using policies

You control access in Amazon by creating policies and attaching them to Amazon identities or resources. A policy is an object in Amazon that, when associated with an identity or resource, defines their permissions. Amazon evaluates these policies when a principal (user, root user, or role session) makes a request. Permissions in the policies determine whether the request is allowed or denied. Most policies are stored in Amazon as JSON documents. For more information about the structure and contents of JSON policy documents, see <u>Overview of JSON policies</u> in the *IAM User Guide*.

Administrators can use Amazon JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

By default, users and roles have no permissions. To grant users permission to perform actions on the resources that they need, an IAM administrator can create IAM policies. The administrator can then add the IAM policies to roles, and users can assume the roles.

IAM policies define permissions for an action regardless of the method that you use to perform the operation. For example, suppose that you have a policy that allows the iam:GetRole action. A user with that policy can get role information from the Amazon Web Services Management Console, the Amazon CLI, or the Amazon API.

Identity-based policies

Identity-based policies are JSON permissions policy documents that you can attach to an identity, such as an IAM user, group of users, or role. These policies control what actions users and roles can perform, on which resources, and under what conditions. To learn how to create an identity-based policy, see <u>Define custom IAM permissions with customer managed policies</u> in the *IAM User Guide*.

Identity-based policies can be further categorized as *inline policies* or *managed policies*. Inline policies are embedded directly into a single user, group, or role. Managed policies are standalone policies that you can attach to multiple users, groups, and roles in your Amazon Web Services account. Managed policies include Amazon managed policies and customer managed policies. To learn how to choose between a managed policy or an inline policy, see <u>Choose between managed</u> <u>policies and inline policies</u> in the *IAM User Guide*.

Resource-based policies

Resource-based policies are JSON policy documents that you attach to a resource. Examples of resource-based policies are IAM *role trust policies* and Amazon S3 *bucket policies*. In services that support resource-based policies, service administrators can use them to control access to a specific resource. For the resource where the policy is attached, the policy defines what actions a specified principal can perform on that resource and under what conditions. You must <u>specify a principal</u> in a resource-based policy. Principals can include accounts, users, roles, federated users, or Amazon Web Services services.

Resource-based policies are inline policies that are located in that service. You can't use Amazon managed policies from IAM in a resource-based policy.

Other policy types

Amazon supports additional, less-common policy types. These policy types can set the maximum permissions granted to you by the more common policy types.

• **Permissions boundaries** – A permissions boundary is an advanced feature in which you set the maximum permissions that an identity-based policy can grant to an IAM entity (IAM user

or role). You can set a permissions boundary for an entity. The resulting permissions are the intersection of an entity's identity-based policies and its permissions boundaries. Resource-based policies that specify the user or role in the Principal field are not limited by the permissions boundary. An explicit deny in any of these policies overrides the allow. For more information about permissions boundaries, see Permissions boundaries for IAM entities in the *IAM User Guide*.

- Service control policies (SCPs) SCPs are JSON policies that specify the maximum permissions for an organization or organizational unit (OU) in Amazon Organizations. Amazon Organizations is a service for grouping and centrally managing multiple Amazon Web Services accounts that your business owns. If you enable all features in an organization, then you can apply service control policies (SCPs) to any or all of your accounts. The SCP limits permissions for entities in member accounts, including each Amazon Web Services account root user. For more information about Organizations and SCPs, see <u>Service control policies</u> in the *Amazon Organizations User Guide*.
- Resource control policies (RCPs) RCPs are JSON policies that you can use to set the maximum available permissions for resources in your accounts without updating the IAM policies attached to each resource that you own. The RCP limits permissions for resources in member accounts and can impact the effective permissions for identities, including the Amazon Web Services account root user, regardless of whether they belong to your organization. For more information about Organizations and RCPs, including a list of Amazon Web Services services that support RCPs, see <u>Resource control policies (RCPs)</u> in the *Amazon Organizations User Guide*.
- Session policies Session policies are advanced policies that you pass as a parameter when you
 programmatically create a temporary session for a role or federated user. The resulting session's
 permissions are the intersection of the user or role's identity-based policies and the session
 policies. Permissions can also come from a resource-based policy. An explicit deny in any of these
 policies overrides the allow. For more information, see <u>Session policies</u> in the *IAM User Guide*.

How Amazon CodePipeline works with IAM

Before you use IAM to manage access to CodePipeline, you should understand what IAM features are available to use with CodePipeline. To get a high-level view of how CodePipeline and other Amazon Web Services services that work with IAM, see <u>Amazon Web Services services that work</u> with IAM in the *IAM User Guide*.

Topics

- <u>CodePipeline identity-based policies</u>
- CodePipeline resource-based policies

- Authorization based on CodePipeline tags
- CodePipeline IAM roles

CodePipeline identity-based policies

With IAM identity-based policies, you can specify allowed or denied actions and resources as well as the conditions under which actions are allowed or denied. CodePipeline supports specific actions, resources, and condition keys. To learn about all of the elements that you use in a JSON policy, see <u>IAM JSON Policy Elements Reference</u> in the *IAM User Guide*.

Actions

Administrators can use Amazon JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

The Action element of a JSON policy describes the actions that you can use to allow or deny access in a policy. Policy actions usually have the same name as the associated Amazon API operation. There are some exceptions, such as *permission-only actions* that don't have a matching API operation. There are also some operations that require multiple actions in a policy. These additional actions are called *dependent actions*.

Include actions in a policy to grant permissions to perform the associated operation.

Policy actions in CodePipeline use the following prefix before the action: codepipeline:.

For example, to grant someone permission to view the existing pipelines in the account, you include the codepipeline:GetPipeline action in their policy. Policy statements must include either an Action or NotAction element. CodePipeline defines its own set of actions that describe tasks that you can perform with this service.

To specify multiple actions in a single statement, separate them with commas as follows:

```
"Action": [
"codepipeline:action1",
"codepipeline:action2"
```

You can specify multiple actions using wildcards (*). For example, to specify all actions that begin with the word Get, include the following action:

```
"Action": "codepipeline:Get*"
```

For a list of CodePipeline actions, see <u>Actions Defined by Amazon CodePipeline</u> in the *IAM User Guide*.

Resources

Administrators can use Amazon JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

The Resource JSON policy element specifies the object or objects to which the action applies. Statements must include either a Resource or a NotResource element. As a best practice, specify a resource using its <u>Amazon Resource Name (ARN)</u>. You can do this for actions that support a specific resource type, known as *resource-level permissions*.

For actions that don't support resource-level permissions, such as listing operations, use a wildcard (*) to indicate that the statement applies to all resources.

"Resource": "*"

CodePipeline resources and operations

In CodePipeline, the primary resource is a pipeline. In a policy, you use an Amazon Resource Name (ARN) to identify the resource that the policy applies to. CodePipeline supports other resources that can be used with the primary resource, such as stages, actions, and custom actions. These are referred to as subresources. These resources and subresources have unique Amazon Resource Names (ARNs) associated with them. For more information about ARNs, see <u>Amazon Resource Names (ARN) and Amazon Web Services service namespaces</u> in the *Amazon Web Services General Reference*. To get the pipeline ARN associated with your pipeline, you can find the pipeline ARN under **Settings** in the console. For more information, see <u>View the pipeline ARN and service role ARN (console)</u>.

Resource Type	ARN Format
Pipeline	arn:aws:codepipeline: <i>region:account:pipeline-name</i>
Stage	<pre>arn:aws:codepipeline:region:account:pipeline-name /stage- name</pre>

Amazon CodePipeline

Resource Type	ARN Format
Action	<pre>arn:aws:codepipeline:region:account:pipeline-name /stage- name /action-name</pre>
Custom action	arn:aws:codepipeline: <i>region:account</i> :actionty pe: <i>owner/category/provider/version</i>
All CodePipeline resources	arn:aws:codepipeline:*
All CodePipeline resources owned by the specified account in the specified Region	arn:aws:codepipeline: <i>region:account</i> :*

1 Note

Most services in Amazon treat a colon (:) or a forward slash (/) as the same character in ARNs. However, CodePipeline uses an exact match in event patterns and rules. Be sure to use the correct ARN characters when creating event patterns so that they match the ARN syntax in the pipeline you want to match.

In CodePipeline, there are API calls that support resource-level permissions. Resource-level permissions indicate whether an API call can specify a resource ARN, or whether the API call can only specify all resources using the wildcard. See <u>CodePipeline permissions reference</u> for a detailed description of resource-level permissions and a listing of the CodePipeline API calls that support resource-level permissions.

For example, you can indicate a specific pipeline (*myPipeline*) in your statement using its ARN as follows:

```
"Resource": "arn:aws:codepipeline:us-east-2:111222333444:myPipeline"
```

You can also specify all pipelines that belong to a specific account by using the (*) wildcard character as follows:

"Resource": "arn:aws:codepipeline:us-east-2:111222333444:*"

To specify all resources, or if a specific API action does not support ARNs, use the (*) wildcard character in the Resource element as follows:

"Resource": "*"

Note

When you create IAM policies, follow the standard security advice of granting least privilege—that is, granting only the permissions required to perform a task. If an API call supports ARNs, then it supports resource-level permissions, and you do not need to use the (*) wildcard character.

Some CodePipeline API calls accept multiple resources (for example, GetPipeline). To specify multiple resources in a single statement, separate their ARNs with commas, as follows:

"Resource": ["arn1", "arn2"]

CodePipeline provides a set of operations to work with the CodePipeline resources. For a list of available operations, see CodePipeline permissions reference.

Condition keys

Administrators can use Amazon JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

The Condition element (or Condition *block*) lets you specify conditions in which a statement is in effect. The Condition element is optional. You can create conditional expressions that use <u>condition operators</u>, such as equals or less than, to match the condition in the policy with values in the request.

If you specify multiple Condition elements in a statement, or multiple keys in a single Condition element, Amazon evaluates them using a logical AND operation. If you specify multiple values for a single condition key, Amazon evaluates the condition using a logical OR operation. All of the conditions must be met before the statement's permissions are granted. You can also use placeholder variables when you specify conditions. For example, you can grant an IAM user permission to access a resource only if it is tagged with their IAM user name. For more information, see IAM policy elements: variables and tags in the *IAM User Guide*.

Amazon supports global condition keys and service-specific condition keys. To see all Amazon global condition keys, see Amazon global condition context keys in the *IAM User Guide*.

CodePipeline defines its own set of condition keys and also supports using some global condition keys. To see all Amazon global condition keys, see <u>Amazon Global Condition Context Keys</u> in the *IAM User Guide*.

All Amazon EC2 actions support the aws:RequestedRegion and ec2:Region condition keys. For more information, see Example: Restricting Access to a Specific Region.

To see a list of CodePipeline condition keys, see <u>Condition Keys for Amazon CodePipeline</u> in the *IAM User Guide*. To learn with which actions and resources you can use a condition key, see <u>Actions</u> <u>Defined by Amazon CodePipeline</u>.

Examples

To view examples of CodePipeline identity-based policies, see <u>Amazon CodePipeline identity-based</u> <u>policy examples</u>.

CodePipeline resource-based policies

CodePipeline does not support resource-based policies. However, a resource-based policy example for the S3 service related to CodePipeline is provided.

Examples

To view examples of CodePipeline resource-based policies, see <u>Amazon CodePipeline resource-based policy examples</u>,

Authorization based on CodePipeline tags

You can attach tags to CodePipeline resources or pass tags in a request to CodePipeline. To control access based on tags, you provide tag information in the <u>condition element</u> of a policy using the codepipeline:ResourceTag/*key-name*, aws:RequestTag/*key-name*, or aws:TagKeys condition keys. For more information about tagging CodePipeline resources, see Tagging resources.

To view an example identity-based policy for limiting access to a resource based on the tags on that resource, see Using tags to control access to CodePipeline resources.

CodePipeline IAM roles

An <u>IAM role</u> is an entity in your Amazon account that has specific permissions.

Using temporary credentials with CodePipeline

You can use temporary credentials to sign in with federation, assume an IAM role, or to assume a cross-account role. You obtain temporary security credentials by calling Amazon STS API operations such as <u>AssumeRole</u> or <u>GetFederationToken</u>.

CodePipeline supports the use of temporary credentials.

Service roles

CodePipeline allows a service to assume a <u>service role</u> on your behalf. This role allows the service to access resources in other services to complete an action on your behalf. Service roles appear in your IAM account and are owned by the account. This means that an IAM administrator can change the permissions for this role. However, doing so might break the functionality of the service.

CodePipeline supports service roles.

Amazon CodePipeline identity-based policy examples

By default, IAM users and roles don't have permission to create or modify CodePipeline resources. They also can't perform tasks using the Amazon Web Services Management Console, Amazon CLI, or Amazon API. An IAM administrator must create IAM policies that grant users and roles permission to perform specific API operations on the specified resources they need. The administrator must then attach those policies to the IAM users or groups that require those permissions.

To learn how to create an IAM identity-based policy using these example JSON policy documents, see <u>Creating Policies on the JSON Tab</u> in the *IAM User Guide*.

To learn how to create a pipeline that uses resources from another account, and for the related example policies, see <u>Create a pipeline in CodePipeline that uses resources from another Amazon</u> <u>account</u>.

Topics

Identity-based policy examples

- Policy best practices
- Viewing resources in the console
- Allow users to view their own permissions
- Identity-based policies (IAM) examples
- Using tags to control access to CodePipeline resources
- Permissions required to use the CodePipeline console
- Permissions required to view compute logs in the CodePipeline console
- Amazon managed policies for Amazon CodePipeline
- Customer managed policy examples

Policy best practices

Identity-based policies determine whether someone can create, access, or delete CodePipeline resources in your account. These actions can incur costs for your Amazon Web Services account. When you create or edit identity-based policies, follow these guidelines and recommendations:

• Get started with Amazon managed policies and move toward least-privilege permissions

– To get started granting permissions to your users and workloads, use the Amazon managed policies that grant permissions for many common use cases. They are available in your Amazon Web Services account. We recommend that you reduce permissions further by defining Amazon customer managed policies that are specific to your use cases. For more information, see <u>Amazon managed policies</u> or Amazon managed policies for job functions in the IAM User Guide.

- **Apply least-privilege permissions** When you set permissions with IAM policies, grant only the permissions required to perform a task. You do this by defining the actions that can be taken on specific resources under specific conditions, also known as *least-privilege permissions*. For more information about using IAM to apply permissions, see <u>Policies and permissions in IAM</u> in the *IAM User Guide*.
- Use conditions in IAM policies to further restrict access You can add a condition to your policies to limit access to actions and resources. For example, you can write a policy condition to specify that all requests must be sent using SSL. You can also use conditions to grant access to service actions if they are used through a specific Amazon Web Services service, such as Amazon CloudFormation. For more information, see <u>IAM JSON policy elements: Condition</u> in the *IAM User Guide*.
- Use IAM Access Analyzer to validate your IAM policies to ensure secure and functional permissions IAM Access Analyzer validates new and existing policies so that the policies

adhere to the IAM policy language (JSON) and IAM best practices. IAM Access Analyzer provides more than 100 policy checks and actionable recommendations to help you author secure and functional policies. For more information, see <u>Validate policies with IAM Access Analyzer</u> in the *IAM User Guide*.

Require multi-factor authentication (MFA) – If you have a scenario that requires IAM users or a
root user in your Amazon Web Services account, turn on MFA for additional security. To require
MFA when API operations are called, add MFA conditions to your policies. For more information,
see Secure API access with MFA in the IAM User Guide.

For more information about best practices in IAM, see <u>Security best practices in IAM</u> in the *IAM User Guide*.

Viewing resources in the console

The CodePipeline console requires the ListRepositories permission to display a list of repositories for your Amazon account in the Amazon Region where you are signed in. The console also includes a **Go to resource** function to quickly perform a case insensitive search for resources. This search is performed in your Amazon account in the Amazon Region where you are signed in. The following resources are displayed across the following services:

- Amazon CodeBuild: Build projects
- Amazon CodeCommit: Repositories
- Amazon CodeDeploy: Applications
- Amazon CodePipeline: Pipelines

To perform this search across resources in all services, you must have the following permissions:

- CodeBuild: ListProjects
- CodeCommit: ListRepositories
- CodeDeploy: ListApplications
- CodePipeline: ListPipelines

Results are not returned for a service's resources if you do not have permissions for that service. Even if you have permissions for viewing resources, some resources are not returned if there is an explicit Deny to view those resources.

Allow users to view their own permissions

This example shows how you might create a policy that allows IAM users to view the inline and managed policies that are attached to their user identity. This policy includes permissions to complete this action on the console or programmatically using the Amazon CLI or Amazon API.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "ViewOwnUserInfo",
            "Effect": "Allow",
            "Action": [
                "iam:GetUserPolicy",
                "iam:ListGroupsForUser",
                "iam:ListAttachedUserPolicies",
                "iam:ListUserPolicies",
                "iam:GetUser"
            ],
            "Resource": ["arn:aws-cn:iam::*:user/${aws:username}"]
        },
        {
            "Sid": "NavigateInConsole",
            "Effect": "Allow",
            "Action": [
                "iam:GetGroupPolicy",
                "iam:GetPolicyVersion",
                "iam:GetPolicy",
                "iam:ListAttachedGroupPolicies",
                "iam:ListGroupPolicies",
                "iam:ListPolicyVersions",
                "iam:ListPolicies",
                "iam:ListUsers"
            ],
            "Resource": "*"
        }
    ]
}
```

Identity-based policies (IAM) examples

You can attach policies to IAM identities. For example, you can do the following:

- Attach a permissions policy to a user or a group in your account To grant a user permissions to view pipelines in the CodePipeline console, you can attach a permissions policy to a user or group that the user belongs to.
- Attach a permissions policy to a role (grant cross-account permissions) You can attach an identity-based permissions policy to an IAM role to grant cross-account permissions. For example, the administrator in Account A can create a role to grant cross-account permissions to another Amazon account (for example, Account B) or an Amazon Web Services service as follows:
 - 1. Account A administrator creates an IAM role and attaches a permissions policy to the role that grants permissions on resources in Account A.
 - 2. Account A administrator attaches a trust policy to the role identifying Account B as the principal who can assume the role.
 - 3. Account B administrator can then delegate permissions to assume the role to any users in Account B. Doing this allows users in Account B to create or access resources in Account A. The principal in the trust policy can also be an Amazon Web Services service principal if you want to grant an Amazon Web Services service permissions to assume the role.

For more information about using IAM to delegate permissions, see <u>Access Management</u> in the *IAM User Guide*.

The following shows an example of a permissions policy that grants permissions to disable and enable transitions between all stages in the pipeline named MyFirstPipeline in the us-west-2 region:

```
{
   "Version": "2012-10-17",
   "Statement" : [
    {
        "Effect" : "Allow",
        "Action" : [
            "codepipeline:EnableStageTransition",
            "codepipeline:DisableStageTransition"
        ],
        "Resource" : [
            "arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline/*"
        ]
        }
    ]
}
```

The following example shows a policy in the 111222333444 account that allows users to view, but not change, the pipeline named MyFirstPipeline in the CodePipeline console. This policy is based on the AWSCodePipeline_ReadOnlyAccess managed policy, but because it is specific to the MyFirstPipeline pipeline, it cannot use the managed policy directly. If you do not want to restrict the policy to a specific pipeline, consider using one of the managed policies created and maintained by CodePipeline. For more information, see <u>Working with Managed Policies</u>. You must attach this policy to an IAM role you create for access, for example, a role named CrossAccountPipelineViewers:

```
{
  "Statement": [
    {
      "Action": [
        "codepipeline:GetPipeline",
        "codepipeline:GetPipelineState",
        "codepipeline:GetPipelineExecution",
        "codepipeline:ListPipelineExecutions",
        "codepipeline:ListActionExecutions",
        "codepipeline:ListActionTypes",
        "codepipeline:ListPipelines",
        "codepipeline:ListTagsForResource",
        "iam:ListRoles",
        "s3:ListAllMyBuckets",
        "codecommit:ListRepositories",
        "codedeploy:ListApplications",
        "lambda:ListFunctions",
        "codestar-notifications:ListNotificationRules",
        "codestar-notifications:ListEventTypes",
        "codestar-notifications:ListTargets"
      ],
      "Effect": "Allow",
      "Resource": "arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline"
    },
    {
      "Action": [
        "codepipeline:GetPipeline",
        "codepipeline:GetPipelineState",
        "codepipeline:GetPipelineExecution",
        "codepipeline:ListPipelineExecutions",
        "codepipeline:ListActionExecutions",
        "codepipeline:ListActionTypes",
        "codepipeline:ListPipelines",
```

```
"codepipeline:ListTagsForResource",
        "iam:ListRoles",
        "s3:GetBucketPolicy",
        "s3:GetObject",
        "s3:ListBucket",
        "codecommit:ListBranches",
        "codedeploy:GetApplication",
        "codedeploy:GetDeploymentGroup",
        "codedeploy:ListDeploymentGroups",
        "elasticbeanstalk:DescribeApplications",
        "elasticbeanstalk:DescribeEnvironments",
        "lambda:GetFunctionConfiguration",
        "opsworks:DescribeApps",
        "opsworks:DescribeLayers",
        "opsworks:DescribeStacks"
      ],
      "Effect": "Allow",
      "Resource": "*"
    },
    {
      "Sid": "CodeStarNotificationsReadOnlyAccess",
      "Effect": "Allow",
      "Action": [
        "codestar-notifications:DescribeNotificationRule"
      ],
      "Resource": "*",
      "Condition": {
        "StringLike": {
          "codestar-notifications:NotificationsForResource": "arn:aws:codepipeline:*"
        }
      }
    }
  ],
  "Version": "2012-10-17"
}
```

After you create this policy, create the IAM role in the 111222333444 account and attach the policy to that role. In the role's trust relationships, you must add the Amazon account that will assume this role. The following example shows a policy that allows users from the 11111111111 Amazon account to assume roles defined in the 111222333444 account:

```
"Version": "2012-10-17",
```

{

```
User Guide
```

The following example shows a policy created in the **111111111111** Amazon account that allows users to assume the role named **CrossAccountPipelineViewers** in the **111222333444** account:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "sts:AssumeRole",
            "Resource": "arn:aws:iam::111222333444:role/CrossAccountPipelineViewers"
        }
    ]
}
```

You can create IAM policies to restrict the calls and resources that users in your account have access to, and then attach those policies to your administrative user. For more information about how to create IAM roles and to explore example IAM policy statements for CodePipeline, see <u>Customer</u> managed policy examples.

Using tags to control access to CodePipeline resources

Conditions in IAM policy statements are part of the syntax that you use to specify permissions to resources required by CodePipeline actions. Using tags in conditions is one way to control access to resources and requests. For information about tagging CodePipeline resources, see <u>Tagging</u> resources. This topic discusses tag-based access control.

When you design IAM policies, you might be setting granular permissions by granting access to specific resources. As the number of resources that you manage grows, this task becomes more difficult. Tagging resources and using tags in policy statement conditions can make this task easier.

You grant access in bulk to any resource with a certain tag. Then you repeatedly apply this tag to relevant resources, during creation or later.

Tags can be attached to the resource or passed in the request to services that support tagging. In CodePipeline, resources can have tags, and some actions can include tags. When you create an IAM policy, you can use tag condition keys to control:

- Which users can perform actions on a pipeline resource, based on tags that it already has.
- Which tags can be passed in an action's request.
- Whether specific tag keys can be used in a request.

String condition operators let you construct Condition elements that restrict access based on comparing a key to a string value. You can add IfExists to the end of any condition operator name except the Null condition. You do this to say "If the policy key is present in the context of the request, process the key as specified in the policy. If the key is not present, evaluate the condition element as true." For example, you can use StringEqualsIfExists to restrict by condition keys that might not be present on other types of resources.

For the complete syntax and semantics of tag condition keys, see <u>Controlling Access Using Tags</u>. For additional information about condition keys, see the following resources. The CodePipeline policy examples in this section align with the following information about condition keys and expand on it with examples of nuances for CodePipeline such as nesting of resources.

- String condition operators
- Amazon Web Services services that work with IAM
- SCP syntax
- IAM JSON policy elements: Condition
- aws:RequestTag/tag-key
- <u>Condition keys for CodePipeline</u>

The following examples demonstrate how to specify tag conditions in policies for CodePipeline users.

Example 1: Limit actions based on tags in the request

The AWSCodePipeline_FullAccess managed user policy gives users unlimited permission to perform any CodePipeline action on any resource.

The following policy limits this power and denies unauthorized users permission to create pipelines where specific tags are listed in the request. To do that, it denies the CreatePipeline action if the request specifies a tag named Project with one of the values ProjectA or ProjectB. (The aws:RequestTag condition key is used to control which tags can be passed in an IAM request.)

In the following example, the intent of the policy is to deny unauthorized users permission to create a pipeline with the tag values specified. However, creating a pipeline requires accessing resources in addition to the pipeline itself (for example, pipeline actions and stages). Because the 'Resource' specified in the policy is '*', the policy is evaluated against every resource that has an ARN and is created when the pipeline is being created. These additional resources do not have the tag condition key, so the StringEquals check fails, and the user is not granted the ability to create any pipeline. To address this, use the StringEqualsIfExists condition operator instead. This way, the test only happens if the condition key exists.

You could read the following as: "If the resource being checked has a tag "RequestTag/Project" condition key, then allow the action only if the key value begins with projectA. If the resource being checked does not have that condition key, then don't worry about it."

In addition, the policy prevents these unauthorized users from tampering with the resources by using the aws: TagKeys condition key to not allow tag modification actions to include these same tag values. A customer's administrator must attach this IAM policy to unauthorized administrative users, in addition to the managed user policy.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": [
        "codepipeline:CreatePipeline",
        "codepipeline:TagResource"
      ],
      "Resource": "*",
      "Condition": {
        "StringEqualsIfExists": {
          "aws:RequestTag/Project": ["ProjectA", "ProjectB"]
        }
      }
    },
    {
      "Effect": "Deny",
```

```
"Action": [
    "codepipeline:UntagResource"
],
    "Resource": "*",
    "Condition": {
        "ForAllValues:StringEquals": {
            "aws:TagKeys": ["Project"]
        }
    }
    }
}
```

Example 2: Limit tagging actions based on resource tags

The AWSCodePipeline_FullAccess managed user policy gives users unlimited permission to perform any CodePipeline action on any resource.

The following policy limits this power and denies unauthorized users permission to perform actions on specified project pipelines. To do that, it denies some actions if the resource has a tag named Project with one of the values ProjectA or ProjectB. (The aws:ResourceTag condition key is used to control access to the resources based on the tags on those resources.) A customer's administrator must attach this IAM policy to unauthorized IAM users, in addition to the managed user policy.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": [
        "codepipeline:TagResource"
      ],
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "aws:ResourceTag/Project": ["ProjectA", "ProjectB"]
        }
      }
    }
  ]
}
```

Example 3: Allow actions based on tags in the request

The following policy grants users permission to create development pipelines in CodePipeline.

To do that, it allows the CreatePipeline and TagResource actions if the request specifies a tag named Project with the value ProjectA. In other words, the only tag key which can be specified is Project, and its value must be ProjectA.

The aws:RequestTag condition key is used to control which tags can be passed in an IAM request. The aws:TagKeys condition ensures tag key case sensitivity. This policy is useful for users or roles who don't have the AWSCodePipeline_FullAccess managed user policy attached. The managed policy gives users unlimited permission to perform any CodePipeline action on any resource.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "codepipeline:CreatePipeline",
        "codepipeline:TagResource"
      ],
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "aws:RequestTag/Project": "ProjectA"
        },
        "ForAllValues:StringEquals": {
          "aws:TagKeys": ["Project"]
        }
      }
    }
  ]
}
```

Example 4: Limit untagging actions based on resource tags

The AWSCodePipeline_FullAccess managed user policy gives users unlimited permission to perform any CodePipeline action on any resource.

Amazon CodePipeline

The following policy limits this power and denies unauthorized users permission to perform actions on specified project pipelines. To do that, it denies some actions if the resource has a tag named Project with one of the values ProjectA or ProjectB.

Also, the policy prevents these unauthorized users from tampering with the resources by using the aws: TagKeys condition key to not allow tag modification actions to completely remove the Project tag. A customer's administrator must attach this IAM policy to unauthorized users or roles, in addition to the managed user policy.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": [
        "codepipeline:UntagResource"
      ],
      "Resource": "*",
      "Condition": {
        "ForAllValues:StringEquals": {
          "aws:TagKeys": ["Project"]
        }
      }
    }
  ]
}
```

Permissions required to use the CodePipeline console

To use CodePipeline in the CodePipeline console, you must have a minimum set of permissions from the following services:

- Amazon Identity and Access Management
- Amazon Simple Storage Service

These permissions allow you to describe other Amazon resources for your Amazon account.

Depending on the other services you incorporate into your pipelines, you might need permissions from one or more of the following:

Amazon CodeCommit

- CodeBuild
- Amazon CloudFormation
- Amazon CodeDeploy
- Amazon Elastic Beanstalk
- Amazon Lambda
- Amazon OpsWorks

If you create an IAM policy that is more restrictive than the minimum required permissions, the console won't function as intended for users with that IAM policy. To ensure that those users can still use the CodePipeline console, also attach the AWSCodePipeline_ReadOnlyAccess managed policy to the user, as described in <u>Amazon managed policies for Amazon CodePipeline</u>.

You don't need to allow minimum console permissions for users who are making calls to the Amazon CLI or the CodePipeline API.

Permissions required to view compute logs in the CodePipeline console

To view the logs in the Commands action on the CodePipeline console, the console role must have permissions. To view logs in the console, add the logs:GetLogEvents permissions to the console role.

In the console role policy statement, scope down the permissions to the pipeline level as shown in the following example.

```
{
    "Effect": "Allow",
    "Action": [
        "Action": "logs:GetLogEvents"
    ],
    "Resource": "arn:aws:logs:*:YOUR_AWS_ACCOUNT_ID:log-group:/aws/
codepipeline/YOUR_PIPELINE_NAME:*"
}
```

Amazon managed policies for Amazon CodePipeline

An Amazon managed policy is a standalone policy that is created and administered by Amazon. Amazon managed policies are designed to provide permissions for many common use cases so that you can start assigning permissions to users, groups, and roles.

Keep in mind that Amazon managed policies might not grant least-privilege permissions for your specific use cases because they're available for all Amazon customers to use. We recommend that you reduce permissions further by defining <u>customer managed policies</u> that are specific to your use cases.

You cannot change the permissions defined in Amazon managed policies. If Amazon updates the permissions defined in an Amazon managed policy, the update affects all principal identities (users, groups, and roles) that the policy is attached to. Amazon is most likely to update an Amazon managed policy when a new Amazon Web Services service is launched or new API operations become available for existing services.

For more information, see <u>Amazon managed policies</u> in the *IAM User Guide*.

<u> Important</u>

The AWS managed policies AWSCodePipelineFullAccess and AWSCodePipelineReadOnlyAccess have been replaced. Use the AWSCodePipeline_FullAccess and AWSCodePipeline_ReadOnlyAccess policies.

Amazon managed policy: AWSCodePipeline_FullAccess

This is a policy that grants full access to CodePipeline. To view the JSON policy document in the IAM console, see <u>AWSCodePipeline_FullAccess</u>.

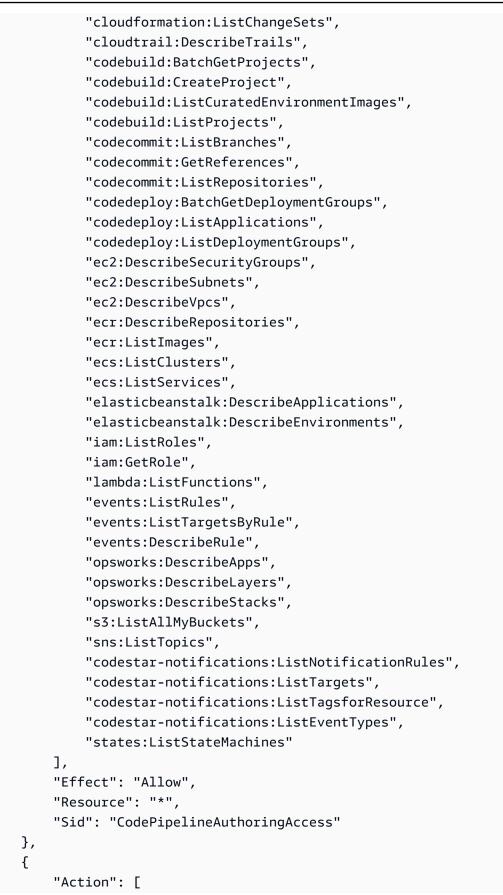
Permissions details

This policy includes the following permissions.

• codepipeline – Grants permissions to CodePipeline.

- chatbot Grants permissions to allow principals to manage resources in Amazon Q Developer in chat applications.
- cloudformation Grants permissions to allow principals to manage resource stacks in Amazon CloudFormation.
- cloudtrail Grants permissions to allow principals to manage logging resources in CloudTrail.
- codebuild Grants permissions to allow principals to access build resources in CodeBuild.
- codecommit Grants permissions to allow principals to access source resources in CodeCommit.
- codedeploy Grants permissions to allow principals to access deployment resources in CodeDeploy.
- codestar-notifications Grants permissions to allow principals to access resources in AWS CodeStar Notifications.
- ec2 Grants permissions to allow deployments in CodeCatalyst to manage elastic load balancing in Amazon EC2.
- ecr Grants permissions to allow access to resources in Amazon ECR.
- elasticbeanstalk Grants permissions to allow principals to access resources in Elastic Beanstalk.
- iam Grants permissions to allow principals to manage roles and policies in IAM.
- lambda Grants permissions to allow principals to manage resources in Lambda.
- events Grants permissions to allow principals to manage resources in CloudWatch Events.
- opsworks Grants permissions to allow principals to manage resources in Amazon OpsWorks.
- s3 Grants permissions to allow principals to manage resources in Amazon S3.
- sns Grants permissions to allow principals to manage notification resources in Amazon SNS.
- states Grants permissions to allow principals to view state machines in Amazon Step Functions. A state machine consists of a collection of states that manage tasks and transition between states.

```
{
    "Statement": [
        {
            "Action": [
            "codepipeline:*",
            "cloudformation:DescribeStacks",
            "cloudformation:ListStacks",
            "cloudformati
```



```
"s3:GetObject",
        "s3:ListBucket",
        "s3:GetBucketPolicy",
        "s3:GetBucketVersioning",
        "s3:GetObjectVersion",
        "s3:CreateBucket",
        "s3:PutBucketPolicy"
    ],
    "Effect": "Allow",
    "Resource": "arn:aws:s3::*:codepipeline-*",
    "Sid": "CodePipelineArtifactsReadWriteAccess"
},
{
    "Action": [
        "cloudtrail:PutEventSelectors",
        "cloudtrail:CreateTrail",
        "cloudtrail:GetEventSelectors",
        "cloudtrail:StartLogging"
    ],
    "Effect": "Allow",
    "Resource": "arn:aws:cloudtrail:*:*:trail/codepipeline-source-trail",
    "Sid": "CodePipelineSourceTrailReadWriteAccess"
},
{
    "Action": [
        "iam:PassRole"
    ],
    "Effect": "Allow",
    "Resource": [
        "arn:aws:iam::*:role/service-role/cwe-role-*"
    ],
    "Condition": {
        "StringEquals": {
            "iam:PassedToService": [
                "events.amazonaws.com"
            1
        }
    },
    "Sid": "EventsIAMPassRole"
},
{
    "Action": [
        "iam:PassRole"
    ],
```

```
"Effect": "Allow",
           "Resource": "*",
           "Condition": {
               "StringEquals": {
                   "iam:PassedToService": [
                       "codepipeline.amazonaws.com"
                   ]
               }
           },
           "Sid": "CodePipelineIAMPassRole"
       },
       {
           "Action": [
               "events:PutRule",
               "events:PutTargets",
               "events:DeleteRule",
               "events:DisableRule",
               "events:RemoveTargets"
           ],
           "Effect": "Allow",
           "Resource": [
               "arn:aws:events:*:*:rule/codepipeline-*"
           ],
           "Sid": "CodePipelineEventsReadWriteAccess"
       },
       {
           "Sid": "CodeStarNotificationsReadWriteAccess",
           "Effect": "Allow",
           "Action": [
               "codestar-notifications:CreateNotificationRule",
               "codestar-notifications:DescribeNotificationRule",
               "codestar-notifications:UpdateNotificationRule",
               "codestar-notifications:DeleteNotificationRule",
               "codestar-notifications:Subscribe",
               "codestar-notifications:Unsubscribe"
           ],
           "Resource": "*",
           "Condition": {
               "StringLike": {
                   "codestar-notifications:NotificationsForResource":
"arn:aws:codepipeline:*"
               }
           }
       },
```

```
{
            "Sid": "CodeStarNotificationsSNSTopicCreateAccess",
            "Effect": "Allow",
            "Action": [
                "sns:CreateTopic",
                "sns:SetTopicAttributes"
            ],
            "Resource": "arn:aws:sns:*:*:codestar-notifications*"
        },
        {
            "Sid": "CodeStarNotificationsChatbotAccess",
            "Effect": "Allow",
            "Action": [
                 "chatbot:DescribeSlackChannelConfigurations",
                "chatbot:ListMicrosoftTeamsChannelConfigurations"
            ],
            "Resource": "*"
        }
    ],
    "Version": "2012-10-17"
}
```

Amazon managed policy: AWSCodePipeline_ReadOnlyAccess

This is a policy that grants read-only access to CodePipeline. To view the JSON policy document in the IAM console, see AWSCodePipeline_ReadOnlyAccess.

Permissions details

This policy includes the following permissions.

- codepipeline Grants permissions to actions in CodePipeline.
- codestar-notifications Grants permissions to allow principals to access resources in AWS CodeStar Notifications.
- s3 Grants permissions to allow principals to manage resources in Amazon S3.
- sns Grants permissions to allow principals to manage notification resources in Amazon SNS.

```
{
    "Statement": [
        {
            "Action": [
                "codepipeline:GetPipeline",
                "codepipeline:GetPipelineState",
                "codepipeline:GetPipelineExecution",
                "codepipeline:ListPipelineExecutions",
                "codepipeline:ListActionExecutions",
                "codepipeline:ListActionTypes",
                "codepipeline:ListPipelines",
                "codepipeline:ListTagsForResource",
                "s3:ListAllMyBuckets",
                "codestar-notifications:ListNotificationRules",
                "codestar-notifications:ListEventTypes",
                "codestar-notifications:ListTargets"
            ],
            "Effect": "Allow",
            "Resource": "*"
        },
        {
            "Action": [
                "s3:GetObject",
                "s3:ListBucket",
                "s3:GetBucketPolicy"
            ],
            "Effect": "Allow",
            "Resource": "arn:aws:s3::*:codepipeline-*"
        },
        {
            "Sid": "CodeStarNotificationsReadOnlyAccess",
            "Effect": "Allow",
            "Action": [
                "codestar-notifications:DescribeNotificationRule"
            ],
            "Resource": "*",
            "Condition": {
                "StringLike": {
                    "codestar-notifications:NotificationsForResource":
 "arn:aws:codepipeline:*"
                }
            }
        ļ
```

```
],
"Version": "2012-10-17"
}
```

Amazon managed policy: AWSCodePipelineApproverAccess

This is a policy that grants permission to approve or reject a manual approval action. To view the JSON policy document in the IAM console, see <u>AWSCodePipelineApproverAccess</u>..

Permissions details

This policy includes the following permissions.

• codepipeline – Grants permissions to actions in CodePipeline.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "codepipeline:GetPipeline",
                "codepipeline:GetPipelineState",
                "codepipeline:GetPipelineExecution",
                "codepipeline:ListPipelineExecutions",
                "codepipeline:ListPipelines",
                "codepipeline:PutApprovalResult"
            ],
            "Effect": "Allow",
            "Resource": "*"
        }
    ]
}
```

Amazon managed policy: AWSCodePipelineCustomActionAccess

This is a policy that grants permission to to create custom actions in CodePipeline or integrate Jenkins resources for build or test actions. To view the JSON policy document in the IAM console, see AWSCodePipelineCustomActionAccess.

Permissions details

This policy includes the following permissions.

• codepipeline – Grants permissions to actions in CodePipeline.

```
{
    "Statement": [
        {
            "Action": [
                 "codepipeline:AcknowledgeJob",
                "codepipeline:GetJobDetails",
                "codepipeline:PollForJobs",
                "codepipeline:PutJobFailureResult",
                 "codepipeline:PutJobSuccessResult"
            ],
            "Effect": "Allow",
            "Resource": "*"
        }
    ],
    "Version": "2012-10-17"
}
```

CodePipeline managed policies and notifications

CodePipeline supports notifications, which can notify users of important changes to pipelines. Managed policies for CodePipeline include policy statements for notification functionality. For more information, see <u>What are notifications?</u>.

Permissions related to notifications in full access managed policies

This managed policy grants permissions for CodePipeline along with the related services CodeCommit, CodeBuild, CodeDeploy, and AWS CodeStar Notifications. The policy also grants Amazon CodePipeline

permissions that you need for working with other services that integrate with your pipelines, such as Amazon S3, Elastic Beanstalk, CloudTrail, Amazon EC2, and Amazon CloudFormation. Users with this managed policy applied can also create and manage Amazon SNS topics for notifications, subscribe and unsubscribe users to topics, list topics to choose as targets for notification rules, and list Amazon Q Developer in chat applications clients configured for Slack.

The AWSCodePipeline_FullAccess managed policy includes the following statements to allow full access to notifications.

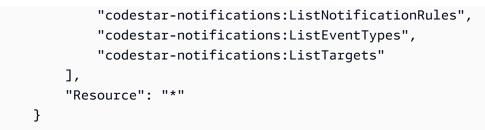
```
{
       "Sid": "CodeStarNotificationsReadWriteAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:CreateNotificationRule",
           "codestar-notifications:DescribeNotificationRule",
           "codestar-notifications:UpdateNotificationRule",
           "codestar-notifications:DeleteNotificationRule",
           "codestar-notifications:Subscribe",
           "codestar-notifications:Unsubscribe"
       ],
       "Resource": "*",
       "Condition" : {
           "StringLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline"}
       }
   },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:ListNotificationRules",
           "codestar-notifications:ListTargets",
           "codestar-notifications:ListTagsforResource",
           "codestar-notifications:ListEventTypes"
       ],
       "Resource": "*"
   },
   {
       "Sid": "CodeStarNotificationsSNSTopicCreateAccess",
       "Effect": "Allow",
       "Action": [
           "sns:CreateTopic",
           "sns:SetTopicAttributes"
```

```
],
    "Resource": "arn:aws:sns:*:*:codestar-notifications*"
},
{
    "Sid": "SNSTopicListAccess",
    "Effect": "Allow",
    "Action": [
        "sns:ListTopics"
    ],
    "Resource": "*"
},
{
    "Sid": "CodeStarNotificationsChatbotAccess",
    "Effect": "Allow",
    "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
      ],
   "Resource": "*"
}
```

Permissions related to notifications in read-only managed policies

The AWSCodePipeline_ReadOnlyAccess managed policy includes the following statements to allow read-only access to notifications. Users with this policy applied can view notifications for resources, but cannot create, manage, or subscribe to them.

```
{
       "Sid": "CodeStarNotificationsPowerUserAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:DescribeNotificationRule"
       ],
       "Resource": "*",
       "Condition" : {
           "StringLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline"}
       }
  },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
```



For more information about IAM and notifications, see <u>Identity and Access Management for AWS</u> <u>CodeStar Notifications</u>.

Amazon CodePipeline updates to Amazon managed policies

View details about updates to Amazon managed policies for CodePipeline since this service began tracking these changes. For automatic alerts about changes to this page, subscribe to the RSS feed on the CodePipeline <u>Document history</u> page.

Change	Description	Date
<u>AWSCodePipeline_FullAccess</u> – Updates to existing policy	CodePipeline added a permission to this policy to support ListStacks in Amazon CloudFormation.	March 15, 2024
AWSCodePipeline_FullAccess – Updates to existing policy	This policy was updated to add permissions for Amazon Q Developer in chat applicati ons. For more information, see <u>CodePipeline managed</u> <u>policies and notifications</u> .	June 21, 2023
AWSCodePipeline_FullAccess and AWSCodePipeline_Re adOnlyAccess managed policies – Updates to existing policy	CodePipeline added a permission to these policies to support an additiona l notification type using Amazon Q Developer in chat applications, chatbot:L istMicrosoftTeamsC	May 16, 2023

Change	Description	Date
	hannelConfiguratio ns .	
AWSCodePipelineFullAccess – Deprecated	This policy has been replaced by AWSCodePipeline_Fu llAccess . After November 17, 2022, this policy can not be attached to any new users, groups, or roles. For more information, see <u>Amazon</u> <u>managed policies for Amazon</u> <u>CodePipeline</u> .	November 17, 2022
AWSCodePipelineRea dOnlyAccess – Deprecated	This policy has been replaced by AWSCodePipeline_Re adOnlyAccess . After November 17, 2022, this policy can not be attached to any new users, groups, or roles. For more information, see <u>Amazon</u> <u>managed policies for Amazon</u> <u>CodePipeline</u> .	November 17, 2022
CodePipeline started tracking changes	CodePipeline started tracking changes for its Amazon managed policies.	March 12, 2021

Customer managed policy examples

In this section, you can find example user policies that grant permissions for various CodePipeline actions. These policies work when you are using the CodePipeline API, Amazon SDKs, or the

Amazon CLI. When you are using the console, you must grant additional permissions specific to the console. For more information, see Permissions required to use the CodePipeline console.

🚺 Note

All examples use the US West (Oregon) Region (us-west-2) and contain fictitious account IDs.

Examples

- Example 1: Grant permissions to get the state of a pipeline
- Example 2: Grant permissions to enable and disable transitions between stages
- Example 3: Grant permissions to get a list of all available action types
- Example 4: Grant permissions to approve or reject manual approval actions
- Example 5: Grant permissions to poll for jobs for a custom action
- Example 6: Attach or edit a policy for Jenkins integration with Amazon CodePipeline
- Example 7: Configure cross-account access to a pipeline
- Example 8: Use Amazon resources associated with another account in a pipeline

Example 1: Grant permissions to get the state of a pipeline

The following example grants permissions to get the state of the pipeline named MyFirstPipeline:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:GetPipelineState"
            ],
            "Resource": "arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline"
        }
    ]
}
```

Example 2: Grant permissions to enable and disable transitions between stages

The following example grants permissions to disable and enable transitions between all stages in the pipeline named MyFirstPipeline:

To allow the user to disable and enable transitions for a single stage in a pipeline, you must specify the stage. For example, to allow the user to enable and disable transitions for a stage named Staging in a pipeline named MyFirstPipeline:

"Resource": "arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline/Staging"

Example 3: Grant permissions to get a list of all available action types

The following example grants permissions to get a list of all available action types available for pipelines in the us-west-2 Region:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:ListActionTypes"
            ],
            "Resource": "arn:aws:codepipeline:us-west-2:111222333444:actiontype:*"
        }
    ]
}
```

Example 4: Grant permissions to approve or reject manual approval actions

The following example grants permissions to approve or reject manual approval actions in a stage named Staging in a pipeline named MyFirstPipeline:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:PutApprovalResult"
            ],
            "Resource": "arn:aws:codepipeline:us-west-2:111222333444:MyFirstPipeline/
Staging/*"
        }
    ]
}
```

Example 5: Grant permissions to poll for jobs for a custom action

The following example grants permissions to poll for jobs for the custom action named TestProvider, which is a Test action type in its first version, across all pipelines:

1 Note

The job worker for a custom action might be configured under a different Amazon account or require a specific IAM role in order to function.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codepipeline:PollForJobs"
        ],
            "Resource": [
               "arn:aws:codepipeline:us-
west-2:111222333444:actionType:Custom/Test/TestProvider/1"
        ]
```

}

] }

Example 6: Attach or edit a policy for Jenkins integration with Amazon CodePipeline

If you configure a pipeline to use Jenkins for build or test, create a separate identity for that integration and attach an IAM policy that has the minimum permissions required for integration between Jenkins and CodePipeline. This policy is the same as the AWSCodePipelineCustomActionAccess managed policy. The following example shows a policy for Jenkins integration:

```
{
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "codepipeline:AcknowledgeJob",
                "codepipeline:GetJobDetails",
                "codepipeline:PollForJobs",
                "codepipeline:PutJobFailureResult",
                "codepipeline:PutJobSuccessResult"
            ],
            "Resource": "*"
        }
    ],
    "Version": "2012-10-17"
}
```

Example 7: Configure cross-account access to a pipeline

You can configure access to pipelines for users and groups in another Amazon account. The recommended way is to create a role in the account where the pipeline was created. The role should allow users from the other Amazon account to assume that role and access the pipeline. For more information, see <u>Walkthrough: Cross-Account Access Using Roles</u>.

The following example shows a policy in the 80398EXAMPLE account that allows users to view, but not change, the pipeline named MyFirstPipeline in the CodePipeline console. This policy is based on the AWSCodePipeline_ReadOnlyAccess managed policy, but because it is specific to the MyFirstPipeline pipeline, it cannot use the managed policy directly. If you do not want to restrict the policy to a specific pipeline, consider using one of the managed policies created

and maintained by CodePipeline. For more information, see <u>Working with Managed Policies</u>. You must attach this policy to an IAM role you create for access, for example, a role named CrossAccountPipelineViewers:

{		
"Statement": [
{		
"Effect": "Allow",		
"Action": [
"codepipeline:GetPipeline",		
"codepipeline:GetPipelineState",		
"codepipeline:ListActionTypes",		
"codepipeline:ListPipelines",		
"iam:ListRoles",		
"s3:GetBucketPolicy",		
"s3:GetObject",		
"s3:ListAllMyBuckets",		
"s3:ListBucket",		
"codedeploy:GetApplication",		
"codedeploy:GetDeploymentGroup",		
"codedeploy:ListApplications",		
"codedeploy:ListDeploymentGroups",		
"elasticbeanstalk:DescribeApplications",		
"elasticbeanstalk:DescribeEnvironments",		
"lambda:GetFunctionConfiguration",		
"lambda:ListFunctions"		
],		
"Resource": "arn:aws:codepipeline:us-east-2:80398EXAMPLE:MyFirstPipeline"		
}		
],		
"Version": "2012-10-17"		
5		

After you create this policy, create the IAM role in the 80398EXAMPLE account and attach the policy to that role. In the role's trust relationships, you must add the Amazon account that assumes this role. The following example shows a policy that allows users from the *111111111111* Amazon account to assume roles defined in the 80398EXAMPLE account:

```
"Effect": "Allow",
    "Principal": {
        "AWS": "arn:aws:iam::11111111111111:root"
    },
    "Action": "sts:AssumeRole"
    }
]
}
```

The following example shows a policy created in the **111111111111** Amazon account that allows users to assume the role named CrossAccountPipelineViewers in the 80398EXAMPLE account:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "sts:AssumeRole",
            "Resource": "arn:aws:iam::80398EXAMPLE:role/CrossAccountPipelineViewers"
        }
    ]
}
```

Example 8: Use Amazon resources associated with another account in a pipeline

You can configure policies that allow a user to create a pipeline that uses resources in another Amazon account. This requires configuring policies and roles in both the account that creates the pipeline (AccountA) and the account that created the resources to be used in the pipeline (AccountB). You must also create a customer managed key in Amazon Key Management Service to use for cross-account access. For more information and step-by-step examples, see <u>Create a</u> <u>pipeline in CodePipeline that uses resources from another Amazon account</u> and <u>Configure server</u>side encryption for artifacts stored in Amazon S3 for CodePipeline.

The following example shows a policy configured by AccountA for an S3 bucket used to store pipeline artifacts. The policy grants access to AccountB. In the following example, the ARN for AccountB is 012ID_ACCOUNT_B. The ARN for the S3 bucket is codepipeline-us-east-2-1234567890. Replace these ARNs with the ARNs for the S3 bucket and the account you want to allow access:

```
"Version": "2012-10-17",
"Id": "SSEAndSSLPolicy",
"Statement": [
    {
        "Sid": "DenyUnEncryptedObjectUploads",
        "Effect": "Deny",
        "Principal": "*",
        "Action": "s3:PutObject",
        "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*",
        "Condition": {
            "StringNotEquals": {
                "s3:x-amz-server-side-encryption": "aws:kms"
            }
        }
    },
    {
        "Sid": "DenyInsecureConnections",
        "Effect": "Deny",
        "Principal": "*",
        "Action": "s3:*",
        "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*",
        "Condition": {
            "Bool": {
                "aws:SecureTransport": false
            }
        }
   },
    {
        "Sid": "",
        "Effect": "Allow",
        "Principal": {
            "AWS": "arn:aws:iam::012ID_ACCOUNT_B:root"
        },
        "Action": [
            "s3:Get*",
            "s3:Put*"
        ],
        "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*"
    },
    {
        "Sid": "",
        "Effect": "Allow",
        "Principal": {
            "AWS": "arn:aws:iam::012ID_ACCOUNT_B:root"
```

The following example shows a policy configured by AccountA that allows AccountB to assume a role. This policy must be applied to the service role for CodePipeline (CodePipeline_Service_Role). For more information about how to apply policies to roles in IAM, see <u>Modifying a Role</u>. In the following example, 012ID_ACCOUNT_B is the ARN for AccountB:

```
{
    "Version": "2012-10-17",
    "Statement": {
        "Effect": "Allow",
        "Action": "sts:AssumeRole",
        "Resource": [
            "arn:aws:iam::012ID_ACCOUNT_B:role/*"
        ]
    }
}
```

The following example shows a policy configured by AccountB and applied to the <u>EC2 instance</u> role for CodeDeploy. This policy grants access to the S3 bucket used by AccountA to store pipeline artifacts (*codepipeline-us-east-2-1234567890*):

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "s3:Get*"
        ],
            "Resource": [
               "arn:aws:s3:::codepipeline-us-east-2-1234567890/*"
        ]
        },
        {
            "Effect": "Allow",
            "Effect": "Allow",
            "Action": [
            "Effect": "Allow",
            "Action": [
            "Statement": [
```

Identity-based policy examples

```
"s3:ListBucket"
],
"Resource": [
        "arn:aws:s3:::codepipeline-us-east-2-1234567890"
]
}
]
```

The following example shows a policy for Amazon KMS where **arn:aws:kms:useast-1:012ID_ACCOUNT_A:key/222222-3333333-4444-556677EXAMPLE** is the ARN of the customer managed key created in AccountA and configured to allow AccountB to use it:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "kms:DescribeKey",
                "kms:GenerateDataKey*",
                "kms:Encrypt",
                "kms:ReEncrypt*",
                "kms:Decrypt"
            ],
            "Resource": [
                "arn:aws:kms:us-
east-1:012ID_ACCOUNT_A:key/222222-3333333-4444-556677EXAMPLE"
            ]
        }
    ]
}
```

The following example shows an inline policy for an IAM role (CrossAccount_Role) created by AccountB that allows access to CodeDeploy actions required by the pipeline in AccountA.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
```



The following example shows an inline policy for an IAM role (CrossAccount_Role) created by AccountB that allows access to the S3 bucket to download input artifacts and upload output artifacts:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
             "Effect": "Allow",
             "Action": [
                 "s3:GetObject*",
                 "s3:PutObject",
                 "s3:PutObjectAcl"
            ],
            "Resource": [
                 "arn:aws:s3:::codepipeline-us-east-2-1234567890/*"
            ]
        }
    ]
}
```

For more information about how to edit a pipeline for cross-account access to resources, see <u>Step</u> <u>2: Edit the pipeline</u>.

Amazon CodePipeline resource-based policy examples

Other services, such as Amazon S3, also support resource-based permissions policies. For example, you can attach a policy to an S3 bucket to manage access permissions to that bucket. Although CodePipeline doesn't support resource-based policies, it does store artifacts to be used in pipelines in versioned S3 buckets.

Example To create a policy for an S3 bucket to use as the artifact store for CodePipeline

You can use any versioned S3 bucket as the artifact store for CodePipeline. If you use the **Create Pipeline** wizard to create your first pipeline, this S3 bucket is created for you to ensure that all objects uploaded to the artifact store are encrypted and connections to the bucket are secure. If you create your own S3 bucket, as a best practice, consider adding the following policy or its elements to the bucket. In this policy, the ARN for the S3 bucket is codepipeline-useast-2-1234567890. Replace this ARN with the ARN for your S3 bucket:

```
{
    "Version": "2012-10-17",
    "Id": "SSEAndSSLPolicy",
    "Statement": [
        {
            "Sid": "DenyUnEncryptedObjectUploads",
            "Effect": "Deny",
            "Principal": "*",
            "Action": "s3:PutObject",
            "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*",
            "Condition": {
                "StringNotEquals": {
                     "s3:x-amz-server-side-encryption": "aws:kms"
                }
            }
        },
        {
            "Sid": "DenyInsecureConnections",
            "Effect": "Deny",
            "Principal": "*",
            "Action": "s3:*",
            "Resource": "arn:aws:s3:::codepipeline-us-east-2-1234567890/*",
            "Condition": {
                "Bool": {
                     "aws:SecureTransport": false
                }
            }
        }
    ]
}
```

Troubleshooting Amazon CodePipeline identity and access

Use the following information to help you diagnose and fix common issues that you might encounter when working with CodePipeline and IAM.

Topics

- I am not authorized to perform an action in CodePipeline
- I am not authorized to perform iam:PassRole
- I'm an administrator and want to allow others to access CodePipeline
- I want to allow people outside of my Amazon account to access my CodePipeline resources

I am not authorized to perform an action in CodePipeline

If the Amazon Web Services Management Console tells you that you're not authorized to perform an action, you must contact your administrator for assistance. Your administrator is the person who provided you with your user name and password.

The following example error occurs when the mateojackson IAM user tries to use the console to view details about a pipeline, but does not have codepipeline:GetPipeline permissions.

User: arn:aws-cn:iam::123456789012:user/mateojackson is not authorized to perform: codepipeline:GetPipeline on resource: my-pipeline

In this case, Mateo asks his administrator to update his policies to allow him to access the mypipeline resource using the codepipeline:GetPipeline action.

I am not authorized to perform iam:PassRole

If you receive an error that you're not authorized to perform the iam: PassRole action, you must contact your administrator for assistance. Your administrator is the person who provided you with your user name and password. Ask that person to update your policies to allow you to pass a role to CodePipeline.

Some Amazon Web Services services allow you to pass an existing role to that service, instead of creating a new service role or service-linked role. To do this, you must have permissions to pass the role to the service.

The following example error occurs when an IAM user named marymajor tries to use the console to perform an action in CodePipeline. However, the action requires the service to have permissions granted by a service role. Mary does not have permissions to pass the role to the service.

```
User: arn:aws:iam::123456789012:user/marymajor is not authorized to perform: iam:PassRole
```

In this case, Mary asks her administrator to update her policies to allow her to perform the iam: PassRole action.

I'm an administrator and want to allow others to access CodePipeline

To allow others to access CodePipeline, you must grant permission to the people or applications that need access. If you are using Amazon IAM Identity Center to manage people and applications, you assign permission sets to users or groups to define their level of access. Permission sets automatically create and assign IAM policies to IAM roles that are associated with the person or application. For more information, see <u>Permission sets</u> in the *Amazon IAM Identity Center User Guide*.

If you are not using IAM Identity Center, you must create IAM entities (users or roles) for the people or applications that need access. You must then attach a policy to the entity that grants them the correct permissions in CodePipeline. After the permissions are granted, provide the credentials to the user or application developer. They will use those credentials to access Amazon. To learn more about creating IAM users, groups, policies, and permissions, see <u>IAM Identities</u> and <u>Policies and permissions in IAM</u> in the *IAM User Guide*.

I want to allow people outside of my Amazon account to access my CodePipeline resources

You can create a role that users in other accounts or people outside of your organization can use to access your resources. You can specify who is trusted to assume the role. For services that support resource-based policies or access control lists (ACLs), you can use those policies to grant people access to your resources.

To learn more, consult the following:

 To learn whether CodePipeline supports these features, see <u>How Amazon CodePipeline works</u> with IAM.

- To learn how to provide access to your resources across Amazon Web Services accounts that you own, see <u>Providing access to an IAM user in another Amazon Web Services account that you own</u> in the *IAM User Guide*.
- To learn how to provide access to your resources to third-party Amazon Web Services accounts, see <u>Providing access to Amazon Web Services accounts owned by third parties</u> in the *IAM User Guide*.
- To learn how to provide access through identity federation, see <u>Providing access to externally</u> authenticated users (identity federation) in the *IAM User Guide*.
- To learn the difference between using roles and resource-based policies for cross-account access, see <u>Cross account resource access in IAM</u> in the *IAM User Guide*.

CodePipeline permissions reference

Use the following table as a reference when you are setting up access control and writing permissions policies that you can attach to an IAM identity (identity-based policies). The table lists each CodePipeline API operation and the corresponding actions for which you can grant permissions to perform the action. For operations that support *resource-level permissions*, the table lists the Amazon resource for which you can grant the permissions. You specify the actions in the policy's Action field.

Resource-level permissions are those that allow you to specify which resources users are allowed to perform actions on. Amazon CodePipeline provides partial support for resource-level permissions. This means that for some Amazon CodePipeline API calls, you can control when users are allowed to use those actions based on conditions that must be met, or which resources users are allowed to use. For example, you can grant users permission to list pipeline execution information, but only for a specific pipeline or pipelines.

🚺 Note

The **Resources** column lists the resource required for API calls that support resource-level permissions. For API calls that do not support resource-level permissions, you can grant users permission to use it, but you have to specify a wildcard (*) for the resource element of your policy statement.

CodePipeline API Operations and Required Permissions for Actions

AcknowledgeJob

Action: codepipeline:AcknowledgeJob

Required to view information about a specified job and whether that job has been received by the job worker. Used for custom actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

AcknowledgeThirdPartyJob

Action: codepipeline:AcknowledgeThirdPartyJob

Required to confirms a job worker has received the specified job. Used for partner actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

<u>CreateCustomActionType</u>

Action: codepipeline:CreateCustomActionType

Required to create a new custom action that can be used in all pipelines associated with the Amazon account. Used for custom actions only.

Resources:

Action Type

arn:aws:codepipeline:region:account:actiontype:owner/category/provider/version

CreatePipeline

Action: codepipeline: CreatePipeline

Required to create a pipeline.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

DeleteCustomActionType

Action: codepipeline:DeleteCustomActionType

Required to mark a custom action as deleted. PollForJobs for the custom action fails after the action is marked for deletion. Used for custom actions only.

Resources:

Action Type

arn:aws:codepipeline:region:account:actiontype:owner/category/provider/version

DeletePipeline

Action: codepipeline:DeletePipeline

Required to delete a pipeline.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

DeleteWebhook

Action:codepipeline:DeleteWebhook

Required to delete a webhook.

Resources:

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

DeregisterWebhookWithThirdParty

Action:codepipeline:DeregisterWebhookWithThirdParty

Before a webhook is deleted, required to remove the connection between the webhook that was created by CodePipeline and the external tool with events to be detected. Currently supported only for webhooks that target an action type of GitHub.

Resources:

Webhook

CodePipeline permissions reference

arn:aws:codepipeline:region:account:webhook:webhook-name

DisableStageTransition

Action: codepipeline: DisableStageTransition

Required to prevent artifacts in a pipeline from transitioning to the next stage in the pipeline.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

EnableStageTransition

Action: codepipeline: EnableStageTransition

Required to enable artifacts in a pipeline to transition to a stage in a pipeline.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

GetJobDetails

Action: codepipeline:GetJobDetails

Required to retrieve information about a job. Only used for custom actions.

Resources: No resource required.

GetPipeline

Action: codepipeline:GetPipeline

Required to retrieve the structure, stages, actions, and metadata of a pipeline, including the pipeline ARN.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

GetPipelineExecution

Action: codepipeline:GetPipelineExecution

Required to retrieve information about an execution of a pipeline, including details about artifacts, the pipeline execution ID, and the name, version, and status of the pipeline.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

GetPipelineState

Action: codepipeline:GetPipelineState

Required to retrieve information about the state of a pipeline, including the stages and actions.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

GetThirdPartyJobDetails

Action: codepipeline:GetThirdPartyJobDetails

Required to request the details of a job for a third-party action. Used for partner actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

ListActionTypes

Action: codepipeline:ListActionTypes

Required to generate a summary of all CodePipeline action types associated with your account.

Resources:

Action Type

arn:aws:codepipeline:region:account:actiontype:owner/category/provider/version

ListPipelineExecutions

Action: codepipeline:ListPipelineExecutions

Required to generate a summary of the most recent executions for a pipeline.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

ListPipelines

Action: codepipeline:ListPipelines

Required to generate a summary of all of the pipelines associated with your account.

Resources:

Pipeline ARN with wildcard (resource-level permissions at the pipeline name level are not supported)

arn:aws:codepipeline:region:account:*

ListTagsForResource

Action: codepipeline:ListTagsForResource

Required to list tags for a specified resource.

Resources:

Action Type

arn:aws:codepipeline:region:account:actiontype:owner/category/provider/version

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

ListWebhooks

Action:codepipeline:ListWebhooks

Required to list all of the webhooks in the account for that Region.

Resources:

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

PollForJobs

Action(s): codepipeline:PollForJobs

Required to retrieve information about any jobs for CodePipeline to act on.

Resources:

Action Type

arn:aws:codepipeline:*region:account*:actiontype:*owner/category/provider/version*

PollForThirdPartyJobs

Action: codepipeline:PollForThirdPartyJobs

Required to determine whether there are any third-party jobs for a job worker to act on. Used for partner actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

PutActionRevision

Action: codepipeline:PutActionRevision

Required to report information to CodePipeline about new revisions to a source.

Resources:

Action

arn:aws:codepipeline:region:account:pipeline-name/stage-name/action-name

PutApprovalResult

Action: codepipeline: PutApprovalResult

Required to report the response to a manual approval request to CodePipeline. Valid responses are Approved and Rejected.

Resources:

Action

arn:aws:codepipeline:region:account:pipeline-name/stage-name/action-name

🚯 Note

This API call supports resource-level permissions. However, you might encounter an error if you use the IAM console or Policy Generator to create policies with "codepipeline:PutApprovalResult" that specify a resource ARN. If you encounter an error, you can use the **JSON** tab in the IAM console or the CLI to create a policy.

PutJobFailureResult

Action: codepipeline:PutJobFailureResult

Required to report the failure of a job as returned to the pipeline by a job worker. Used for custom actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

PutJobSuccessResult

Action: codepipeline:PutJobSuccessResult

Required to report the success of a job as returned to the pipeline by a job worker. Used for custom actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

PutThirdPartyJobFailureResult

Action: codepipeline:PutThirdPartyJobFailureResult

Required to report the failure of a third-party job as returned to the pipeline by a job worker. Used for partner actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

PutThirdPartyJobSuccessResult

Action: codepipeline:PutThirdPartyJobSuccessResult

Required to report the success of a third-party job as returned to the pipeline by a job worker. Used for partner actions only.

Resources: Supports only a wildcard (*) in the policy Resource element.

PutWebhook

Action:codepipeline:PutWebhook

Required to create a webhook.

Resources:

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

RegisterWebhookWithThirdParty

Action:codepipeline:RegisterWebhookWithThirdParty

Resources:

After a webhook is created, required to configure supported third parties to call the generated webhook URL.

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

RetryStageExecution

Action: codepipeline:RetryStageExecution

Required to resume the pipeline execution by retrying the last failed actions in a stage.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

StartPipelineExecution

Action: codepipeline:StartPipelineExecution

Required to start the specified pipeline (specifically, to start processing the latest commit to the source location specified as part of the pipeline).

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

TagResource

Action: codepipeline:TagResource

Required to tag the specified resource.

Resources:

Action Type

arn:aws:codepipeline:region:account:actiontype:owner/category/provider/version

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

UntagResource

Action: codepipeline: UntagResource

Required to tag the specified resource.

Resources:

Action Type

arn:aws:codepipeline:region:account:actiontype:owner/category/provider/version

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

Webhook

arn:aws:codepipeline:region:account:webhook:webhook-name

UpdatePipeline

Action: codepipeline:UpdatePipeline

Required to update a specified pipeline with edits or changes to its structure.

Resources:

Pipeline

arn:aws:codepipeline:region:account:pipeline-name

Manage the CodePipeline service role

The CodePipeline service role is configured with one or more policies that control access to the Amazon resources used by the pipeline. You might want to attach more policies to this role, edit the policy attached to the role, or configure policies for other service roles in Amazon. You might also want to attach a policy to a role when you configure cross-account access to your pipeline.

<u> Important</u>

Modifying a policy statement or attaching another policy to the role can prevent your pipelines from functioning. Be sure that you understand the implications before you modify the service role for CodePipeline in any way. Make sure you test your pipelines after you make any change to the service role.

Note

In the console, service roles created before September 2018 are created with the name oneClick_AWS-CodePipeline-Service_*ID-Number*. Service roles created after September 2018 use the service role name format AWSCodePipelineServiceRole-*Region-Pipeline_Name*. For example, for a pipeline named MyFirstPipeline in eu-west-2, the console names the role and policy AWSCodePipelineServiceRole-eu-west-2-MyFirstPipeline.

CodePipeline service role policy

The CodePipeline service role policy statement contains the minimum permissions for managing pipelines. You can edit the service role statement to remove or add access to resources you do not use. See the appropriate action reference for the minimum required permissions CodePipeline uses for each action.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "AllowS3BucketAccess",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketVersioning",
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": [
        "arn:aws:s3:::[[pipeArtifactBucketNames]]"
      ],
      "Condition": {
        "StringEquals": {
          "aws:ResourceAccount": "{{accountId}}"
        }
      }
    },
    {
      "Sid": "AllowS30bjectAccess",
      "Effect": "Allow",
      "Action": [
        "s3:PutObject",
        "s3:PutObjectAcl",
        "s3:GetObject",
        "s3:GetObjectVersion",
        "s3:PutObjectTagging",
        "s3:GetObjectTagging",
        "s3:GetObjectVersionTagging"
```

```
User Guide
```

```
],
    "Resource": [
    "arn:aws:s3:::[[pipeArtifactBucketNames]]/*"
],
    "Condition": {
        "StringEquals": {
            "aws:ResourceAccount": "{{accountId}}"
        }
      }
    }
    ]
}
```

i Note

In the policy, the following permissions are required when the S3 objects in your source bucket have tags in them:

s3:PutObjectTagging s3:GetObjectTagging s3:GetObjectVersionTagging

Remove permissions from the CodePipeline service role

You can edit the service role statement to remove access to resources you do not use. For example, if none of your pipelines include Elastic Beanstalk, you can edit the policy statement to remove the section that grants access to Elastic Beanstalk resources.

Similarly, if none of your pipelines includes CodeDeploy, you can edit the policy statement to remove the section that grants access to CodeDeploy resources:

```
{
    "Action": [
        "codedeploy:CreateDeployment",
        "codedeploy:GetApplicationRevision",
        "codedeploy:GetDeployment",
        "codedeploy:GetDeploymentConfig",
        "codedeploy:RegisterApplicationRevision"
],
    "Resource": "*",
```

},

"Effect": "Allow"

Add permissions to the CodePipeline service role

You must update your service role policy statement with permissions for an Amazon Web Services service not already included in the default service role policy statement before you can use it in your pipelines.

This is especially important if the service role you use for your pipelines was created before support was added to CodePipeline for an Amazon Web Services service.

The following table shows when support was added for other Amazon Web Services services.

Amazon Web Services service	CodePipeline support date
CodePipeline invoke action support added. See <u>Service role policy permissions for the</u> <u>CodePipeline invoke action</u> .	March 14, 2025
EC2 action support added. See <u>Service role</u> policy permissions for the EC2 deploy action.	February 21, 2025
EKS action support added. See <u>Service role</u> policy permissions.	February 20, 2025
Amazon Elastic Container Registry ECRBuildAndPublishaction support added.See Service role permissions: ECRBuildAndPublishaction.	November 22, 2024
Amazon Inspector InspectorScan action support added. See <u>Service role permissions:</u> InspectorScan action.	November 22, 2024
Commands action support added. See <u>Service</u> role permissions: Commands action.	October 03, 2024
Amazon CloudFormation action support added. See <u>Service role permissions:</u>	December 30, 2020

Amazon Web Services service	CodePipeline support date
CloudFormationStackSet action and Service role permissions: CloudForm ationStackInstances action.	
CodeCommit full clone output artifact format action support added. See <u>Service role</u> <u>permissions: CodeCommit action</u> .	November 11, 2020
CodeBuild batch builds action support added. See <u>Service role permissions: CodeCommit</u> <u>action</u> .	July 30, 2020
Amazon AppConfig action support added. See <u>Service role permissions: AppConfig action</u> .	June 22, 2020
Amazon Step Functions action support added. See <u>Service role permissions: StepFunct</u> <u>ions action</u> .	May 27, 2020
AWS CodeStar Connections action support added. See <u>Service role permissions:</u> <u>CodeConnections action</u> .	December 18, 2019
S3 deploy action support added. See <u>Service</u> role permissions: S3 deploy action.	January 16, 2019
The CodeDeployToECS action action support added. See <u>Service role permissions:</u> CodeDeployToECS action.	November 27, 2018
Amazon ECR action support added. See <u>Service role permissions: Amazon ECR action</u> .	November 27, 2018
Service Catalog action support added. See Service role permissions: Service Catalog action.	October 16, 2018

Amazon Web Services service	CodePipeline support date
Amazon Device Farm action support added. See <u>Service role permissions: Amazon Device</u> <u>Farm action</u> .	July 19, 2018
Amazon ECS action support added. See Service role permissions: Amazon ECS standard action.	December 12, 2017 / Update for opt in for tagging authorization on July 21, 2017
CodeCommit action support added. See <u>Service role permissions: CodeCommit action</u> .	April 18, 2016
Amazon OpsWorks action support added. See <u>Service role permissions: Amazon OpsWorks</u> <u>action</u> .	June 2, 2016
Amazon CloudFormation action support added. See <u>Service role permissions: Amazon</u> <u>CloudFormation action</u> .	November 3, 2016
Amazon CodeBuild action support added. See <u>Service role permissions: CodeBuild action</u> .	December 1, 2016
Elastic Beanstalk action support added. See <u>Service role permissions: ElasticBe</u> <u>anstalk deploy action</u> .	Initial service launch
CodeDeploy action support added. See <u>Service</u> role permissions: Amazon CodeDeploy action.	Initial service launch
S3 source action support added. See <u>Service</u> role permissions: S3 source action.	Initial service launch

Follow these steps to add permissions for a supported service:

1. Sign in to the Amazon Web Services Management Console and open the IAM console at https://console.amazonaws.cn/iam/.

- 2. In the IAM console, in the navigation pane, choose **Roles**, and then choose your AWS-CodePipeline-Service role from the list of roles.
- 3. On the **Permissions** tab, in **Inline policies**, in the row for your service role policy, choose **Edit Policy**.
- 4. Add the required permissions in the **Policy document** box.

i Note

When you create IAM policies, follow the standard security advice of granting least privilege—that is, granting only the permissions required to perform a task. Some API calls support resource-based permissions and allow access to be limited. For example, in this case, to limit permissions when calling DescribeTasks and ListTasks, you can replace the wildcard character (*) with a resource ARN or with a resource ARN that contains a wildcard character (*). For more information about creating a policy that grants least-privilege access, see https://docs.aws.amazon.com/IAM/latest/UserGuide/best-practices.html#grant-least-privilege.

5. Choose **Review policy** to ensure the policy contains no errors. When the policy is error-free, choose **Apply policy**.

Logging and monitoring in CodePipeline

You can use logging features in Amazon to determine the actions users have taken in your account and the resources that were used. The log files show:

- The time and date of actions.
- The source IP address for an action.
- Which actions failed due to inadequate permissions.

Logging features are available in the following Amazon Web Services services:

 Amazon CloudTrail can be used to log Amazon API calls and related events made by or on behalf of an Amazon Web Services account. For more information, see <u>Logging CodePipeline API calls</u> with Amazon CloudTrail. • Amazon CloudWatch Events can be used to monitor your Amazon Web Services Cloud resources and the applications you run on Amazon. You can create alerts in Amazon CloudWatch Events based on metrics that you define. For more information, see Monitoring CodePipeline events.

Compliance validation for Amazon CodePipeline

To learn whether an Amazon Web Services service is within the scope of specific compliance programs, see <u>Amazon Web Services services in Scope by Compliance Program</u> and choose the compliance program that you are interested in. For general information, see <u>Amazon Web Services</u> <u>Compliance Programs</u>.

You can download third-party audit reports using Amazon Artifact. For more information, see <u>Downloading Reports in Amazon Artifact</u>.

Your compliance responsibility when using Amazon Web Services services is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. Amazon provides the following resources to help with compliance:

- <u>Security & Compliance</u> These solution implementation guides discuss architectural considerations and provide steps for deploying security and compliance features.
- <u>Amazon Compliance Resources</u> This collection of workbooks and guides might apply to your industry and location.
- <u>Evaluating Resources with Rules</u> in the Amazon Config Developer Guide The Amazon Config service assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- <u>Amazon Security Hub</u> This Amazon Web Services service provides a comprehensive view of your security state within Amazon. Security Hub uses security controls to evaluate your Amazon resources and to check your compliance against security industry standards and best practices.
 For a list of supported services and controls, see Security Hub controls reference.
- <u>Amazon GuardDuty</u> This Amazon Web Services service detects potential threats to your Amazon Web Services accounts, workloads, containers, and data by monitoring your environment for suspicious and malicious activities. GuardDuty can help you address various compliance requirements, like PCI DSS, by meeting intrusion detection requirements mandated by certain compliance frameworks.

Resilience in Amazon CodePipeline

The Amazon global infrastructure is built around Amazon Regions and Availability Zones. Amazon Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. With Availability Zones, you can design and operate applications and databases that automatically fail over between zones without interruption. Availability Zones are more highly available, fault tolerant, and scalable than traditional single or multiple data center infrastructures.

For more information about Amazon Regions and Availability Zones, see <u>Amazon Global</u> <u>Infrastructure</u>.

Infrastructure security in Amazon CodePipeline

As a managed service, Amazon CodePipeline is protected by Amazon global network security. For information about Amazon security services and how Amazon protects infrastructure, see <u>Amazon</u> <u>Cloud Security</u>. To design your Amazon environment using the best practices for infrastructure security, see <u>Infrastructure Protection</u> in *Security Pillar Amazon Well-Architected Framework*.

You use Amazon published API calls to access CodePipeline through the network. Clients must support the following:

- Transport Layer Security (TLS). We require TLS 1.2 and recommend TLS 1.3.
- Cipher suites with perfect forward secrecy (PFS) such as DHE (Ephemeral Diffie-Hellman) or ECDHE (Elliptic Curve Ephemeral Diffie-Hellman). Most modern systems such as Java 7 and later support these modes.

Additionally, requests must be signed by using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the <u>Amazon Security Token Service</u> (Amazon STS) to generate temporary security credentials to sign requests.

Security best practices

CodePipeline provides a number of security features to consider as you develop and implement your own security policies. The following best practices are general guidelines and don't represent a complete security solution. Because these best practices might not be appropriate or sufficient for your environment, treat them as helpful considerations rather than prescriptions. You use encryption and authentication for the source repositories that connect to your pipelines. These are the CodePipeline best practices for security:

- If you create a pipeline or action configuration that needs to include secrets, such as tokens or
 passwords, do not enter secrets directly in the action configuration, or default values of variables
 defined at pipeline level or Amazon CloudFormation configuration, because the information will
 display in logs. Use Secrets Manager to set up and store secrets, and then use the referenced
 secret in the pipeline and action configuration, as described in <u>Use Amazon Secrets Manager to
 track database passwords or third-party API keys</u>.
- If you create a pipeline that uses an S3 source bucket, configure server-side encryption for artifacts stored in Amazon S3 for CodePipeline by managing Amazon KMS keys, as described in <u>Configure server-side encryption for artifacts stored in Amazon S3 for CodePipeline</u>.
- If you are using the Jenkins action provider, when you use a Jenkins build provider for your pipeline's build or test action, install Jenkins on an EC2 instance and configure a separate EC2 instance profile. Make sure that the instance profile grants Jenkins only the Amazon permissions required to perform tasks for your project, such as retrieving files from Amazon S3. To learn how to create the role for your Jenkins instance profile, see the steps in <u>Create an IAM role to use for Jenkins integration</u>.

CodePipeline pipeline structure reference

You can use CodePipeline to structure a CI/CD pipeline of automated steps that accomplish tasks that build, test, and deploy your application source code. This reference section provides details about the JSON structure and parameters in your pipeline. For a high-level list of concepts that describe how pipelines are used, see <u>CodePipeline concepts</u>.

- When you create a pipeline, you choose an available source action and provider, such as an S3 bucket, CodeCommit repository, Bitbucket repository, or GitHub repository that contains your source code and starts your pipeline when you commit a source code change. This reference section provides reference information about the available sources for your pipeline. For more information about how to work with source actions, see Start a pipeline in CodePipeline.
- You can choose the test, build, and deploy actions and providers that you want to automatically include when your pipeline runs. This reference section provides reference information about the available actions and how they fit in your pipeline JSON.
- Your finished pipeline will consist of a source stage along with additional stages where you configure actions to deploy and test your application. For a conceptual example of a DevOps pipeline that deploys your application, see DevOps pipeline example.

By default, any pipeline you successfully create in Amazon CodePipeline has a valid structure. However, if you manually create or edit a JSON file to create a pipeline or update a pipeline from the Amazon CLI, you might inadvertently create a structure that is not valid. The following reference can help you better understand the requirements for your pipeline structure and how to troubleshoot issues. See the constraints in <u>Quotas in Amazon CodePipeline</u>, which apply to all pipelines.

The following sections provide high level parameters and their position in the pipeline structure. Pipeline structure requirements are detailed in each section for the following pipeline component types:

- Field reference for the Pipeline declaration
- Field reference for the Stage declaration
- Field reference for the <u>Action declaration</u>
- List of Valid action providers in CodePipeline by action type

- Reference for Valid settings for the PollForSourceChanges parameter
- Reference for Valid input and output artifacts for each action type
- List of links for Valid configuration parameters for each provider type

For more information, see the <u>PipelineDeclaration</u> object in the *CodePipeline API Guide*.

The following example pipeline console view shows the pipeline named new-github, stages named Source, manual, and Build, and actions from GitHub (via GitHub App), manual approval, and CodeBuild action providers.

new-github	🗘 Notify 💌	Edit	Stop execution	Clone pipeline	Release change
Pipeline type: V2 Execution mo	de: SUPERSEDED				
0.0					
Source Succeeded Pipeline execution ID: <u>60a18bar</u>	0 6046 4567				
Pipeline execution ID: 6031803	0-0006-4357-				
Source GitHub (Version 2)					
Succeeded - <u>1 minute ago</u>					
<u>77cc2e44</u>					
View details					
77cc2e44 🗹 Source: Merge pull requ	uest #5 from /fe	ature-branch	***		
Disable transition					
Succeeded Succeeded					Start rollback
Pipeline execution ID: 60a18ba	0-b0d6-4a57				Start rouback
A1					
Approval Manual approval					
Approved - Just now					
View details					
L					
77cc2e44 🗹 Source: Merge pull requ	uest #5 from /fe	ature-branch			
Disable transition					
Disable transition					
Build In progress					
Pipeline execution ID: 60a18ba	0-b0d6-4a57-9aa2-				
Build					
AWS CodeBuild					
In progress - Just now					
View details					
77cc2e44 🗹 Source: Merge pull requ	uest #5 from /fe	ature-branch			

The pipeline editing mode, when viewed in the console diagram, allows you to edit source overrides, triggers, and actions as shown in the following example.

Editing: new-github	diting: new-github		Ľ	Delete	Cancel	Save
Edit: Pipeline properties						Edit
Pipeline type V2						
Execution mode SUPERSEDED						
Edit: Variables Pipeline type V2 required					Edit v	ariables
Name	Default value		Description			
		No variables				
	No variables defi	ned at the pipeline level in this pipelin	e.			
Edit: Triggers					Edit	triggers
For source action: Source						
Filters						
Pull request						
Events: Created Revised Closed						
Include branches: master*						
Edit: Source					Ec	dit stage
Source 🛈						
6		+ Add stage				
Edit: manual			Ca	ancel	Delete	Done
Add entry condition Add s	uccess condition 🔻 🛛 Add fa	ailure condition				
+ Add action group						

Topics

- Pipeline declaration
- Stage declaration
- Action declaration

- Valid action providers in CodePipeline
- Valid settings for the PollForSourceChanges parameter
- Valid input and output artifacts for each action type
- Valid configuration parameters for each provider type

Pipeline declaration

The pipeline and metadata level of a pipeline has a basic structure that includes the following parameters and syntax. The pipeline parameter represents the structure of actions and stages to be performed in the pipeline.

For more information, see the **PipelineDeclaration** object in the *CodePipeline API Guide*.

The following example shows the pipeline and metadata level of the pipeline structure in both JSON and YAML for a V2 type pipeline.

YAML

```
pipeline:
 name: MyPipeline
  roleArn: >-
    arn:aws:iam::ACCOUNT_ID:role/service-role/AWSCodePipelineServiceRole-us-west-2-
MyPipeline
  artifactStore:
    type: S3
    location: amzn-s3-demo-bucket
  stages:
    . . .
 version: 6
  executionMode: SUPERSEDED
  pipelineType: V2
  variables:
  - name: MyVariable
    defaultValue: '1'
 triggers:
  - providerType: CodeStarSourceConnection
    gitConfiguration:
      sourceActionName: Source
      push:
      - branches:
```

includes: - main excludes: - feature-branch pullRequest: - events: - CLOSED branches: includes: - main* metadata: pipelineArn: 'arn:aws:codepipeline:us-west-2:ACCOUNT_ID:MyPipeline' <u>Created</u>: '2019-12-12T06:49:02.733000+00:00' <u>updated</u>: '2020-09-10T06:34:07.447000+00:00' pollingDisabledAt: '2020-09-10T06:34:07.447000+00:00'

JSON

```
{
    "pipeline": {
        "name": "MyPipeline",
        "roleArn": "arn:aws:iam::ACCOUNT_ID:role/service-role/
AWSCodePipelineServiceRole-us-west-2-MyPipeline",
        "artifactStore": {
            "type": "S3",
            "location": "amzn-s3-demo-bucket"
        },
        "stages": {
            . . .
    },
        "version": 6,
        "executionMode": "SUPERSEDED",
                "pipelineType": "V2",
        "variables": [
            {
                "name": "MyVariable",
                "defaultValue": "1"
            }
        ],
        "triggers": [
            {
                "providerType": "CodeStarSourceConnection",
                "gitConfiguration": {
```

```
"sourceActionName": "Source",
                     "push": [
                         {
                             "branches": {
                                 "includes": [
                                      "main"
                                 ],
                                 "excludes": [
                                      "feature-branch"
                                 ]
                             }
                         }
                     ],
                     "pullRequest": [
                         {
                             "events": [
                                 "CLOSED"
                             ],
                             "branches": {
                                 "includes": [
                                      "main*"
                                 ]
                             }
                         }
                     ]
                }
            }
        ]
    },
    "metadata": {
        "pipelineArn": "arn:aws:codepipeline:us-west-2:ACCOUNT_ID:MyPipeline",
        "created": "2019-12-12T06:49:02.733000+00:00",
        "updated": "2020-09-10T06:34:07.447000+00:00",
        "pollingDisabledAt": "2020-09-10T06:34:07.447000+00:00"
    }
}
```

name

The name of the pipeline. When you edit or update a pipeline, the pipeline name cannot be changed.

🚯 Note

If you want to rename an existing pipeline, you can use the CLI get-pipeline command to build a JSON file that contains your pipeline's structure. You can then use the CLI create-pipeline command to create a pipeline with that structure and give it a new name.

roleArn

The IAM ARN for the CodePipeline service role, such as arn:aws:iam::80398EXAMPLE:role/ CodePipeline_Service_Role.

To use the console to view the pipeline service role ARN instead of the JSON structure, choose your pipeline in the console, and then choose **Settings**. Under the **General** tab, the **Service role ARN** field displays.

artifactStore OR artifactStores

The artifactStore field contains the artifact bucket type and location for a pipeline with all actions in the same Amazon Region. If you add actions in a Region different from your pipeline, the artifactStores mapping is used to list the artifact bucket for each Amazon Region where actions are executed. When you create or edit a pipeline, you must have an artifact bucket in the pipeline Region and then you must have one artifact bucket per Region where you plan to execute an action.

🚯 Note

In the pipeline structure, you must include either artifactStore or artifactStores in your pipeline, but you cannot use both. If you create a cross-region action in your pipeline, you must use artifactStores.

The following example shows the basic structure for a pipeline with cross-Region actions that uses the artifactStores parameter:

"pipeline": {

type

The location type for the artifact bucket, specified as Amazon S3.

location

The name of the Amazon S3 bucket automatically generated for you the first time you create a pipeline using the console, such as codepipeline-us-east-2-1234567890, or any Amazon S3 bucket you provision for this purpose

stages

This parameter contains the name of each stage in the pipeline. For more information about the parameters and syntax at the stage level of the pipeline structure, see the <u>StageDeclaration</u> object in the *CodePipeline API Guide*.

The pipeline structure for stages has the following requirements:

- A pipeline must contain at least two stages.
- The first stage of a pipeline must contain at least one source action. It can contain source actions only.
- Only the first stage of a pipeline can contain source actions.
- At least one stage in each pipeline must contain an action that is not a source action.

- All stage names in a pipeline must be unique.
- Stage names cannot be edited in the CodePipeline console. If you edit a stage name by using the Amazon CLI, and the stage contains an action with one or more secret parameters (such as an OAuth token), the value of those secret parameters is not preserved. You must manually enter the value of the parameters (which are masked by four asterisks in the JSON returned by the Amazon CLI) and include them in the JSON structure.

A Important

Pipelines that are inactive for longer than 30 days will have polling disabled for the pipeline. For more information, see <u>pollingDisabledAt</u> in the pipeline structure reference. For the steps to migrate your pipeline from polling to event-based change detection, see <u>Change Detection Methods</u>.

version

The version number of a pipeline is automatically generated and updated every time you update the pipeline.

executionMode

You can set the pipeline execution mode so that you can specify the pipeline behavior for consecutive runs, such as queueing, superseding, or running in parallel mode. For more information, see <u>Set or change the pipeline execution mode</u>.

🛕 Important

For pipelines in PARALLEL mode, stage rollback is not available. Similarly, failure conditions with a rollback result type cannot be added to a PARALLEL mode pipeline.

pipelineType

The pipeline type specifies the available structure and features in the pipeline, such as for a V2 type pipeline. For more information, see Pipeline types.

variables

Variables at the pipeline level are defined when the pipeline is created and resolved at pipeline run time. For more information, see <u>Variables reference</u>. For a tutorial with a pipeline-level variable that is passed at the time of the pipeline execution, see <u>Tutorial: Use pipeline-level variables</u>.

triggers

Triggers allow you to configure your pipeline to start on a particular event type or filtered event type, such as when a change on a particular branch or pull request is detected. Triggers are configurable for source actions with connections that use the CodeStarSourceConnection action in CodePipeline, such as GitHub, Bitbucket, and GitLab. For more information about source actions that use connections, see <u>Add third-party source providers to pipelines using</u> <u>CodeConnections</u>.

For more information and more detailed examples, see <u>Automate starting pipelines using triggers</u> and filtering.

For filtering, regular expression patterns in glob format are supported as detailed in <u>Working with</u> <u>glob patterns in syntax</u>.

🚯 Note

The CodeCommit and S3 source actions require either a configured change detection resource (an EventBridge rule) or use the option to poll the repository for source changes. For pipelines with a Bitbucket, GitHub, or GitHub Enterprise Server source action, you do not have to set up a webhook or default to polling. The connections action manages change detection for you.

🔥 Important

Pipelines that are inactive for longer than 30 days will have polling disabled for the pipeline. For more information, see <u>pollingDisabledAt</u> in the pipeline structure reference. For the steps to migrate your pipeline from polling to event-based change detection, see <u>Change Detection Methods</u>.

gitConfiguration fields

The Git configuration for the trigger, including the event types and any parameters for filtering by branches, file paths, tags, or pull request events.

The fields in the JSON structure are defined as follows:

- sourceActionName: The name of the pipeline source action with the Git configuration.
- push: Push events with filtering. These events use an OR operation between different push filters and an AND operation inside filters.
 - branches: The branches to filter on. Branches use an AND operation between includes and excludes.
 - includes: Patterns to filter on for branches that will be included. Includes use an OR operation.
 - excludes: Patterns to filter on for branches that will be excluded. Excludes use an OR operation.
 - filePaths: The file path names to filter on.
 - includes: Patterns to filter on for file paths that will be included. Includes use an OR operation.
 - excludes: Patterns to filter on for file paths that will be excluded. Excludes use an OR operation.
 - tags: The tag names to filter on.
 - includes: Patterns to filter on for tags that will be included. Includes use an OR operation.
 - excludes: Patterns to filter on for tags that will be excluded. Excludes use an OR operation.
- pullRequest: Pull request events with filtering on pull request events and pull request filters.
 - events: Filters on open, updated, or closed pull request events as specified.
 - branches: The branches to filter on. Branches use an AND operation between includes and excludes.
 - includes: Patterns to filter on for branches that will be included. Includes use an OR operation.
 - excludes: Patterns to filter on for branches that will be excluded. Excludes use an OR operation.
 - filePaths: The file path names to filter on.

- includes: Patterns to filter on for file paths that will be included. Includes use an OR operation.
- excludes: Patterns to filter on for file paths that will be excluded. Excludes use an OR operation.

The following is an example of the trigger configuration for push and pull request event types.

```
"triggers": [
            {
                "provider": "Connection",
                "gitConfiguration": {
                     "sourceActionName": "ApplicationSource",
                     "push": [
                         {
                             "filePaths": {
                                  "includes": [
                                      "projectA/**",
                                      "common/**/*.js"
                                 ],
                                 "excludes": [
                                      "**/README.md",
                                      "**/LICENSE",
                                      "**/CONTRIBUTING.md"
                                 ]
                             },
                             "branches": {
                                 "includes": [
                                      "feature/**",
                                      "release/**"
                                 ],
                                 "excludes": [
                                      "mainline"
                                 ]
                             },
                             "tags": {
                                 "includes": [
                                      "release-v0", "release-v1"
                                 ],
                                 "excludes": [
                                      "release-v2"
                                 ]
                             }
```



Event type push fields for include and exclude

Include and exclude behavior for levels of Git configuration fields for **push** event types are shown in the following list:

**/FILE.md, **/FILE2 (OR operation is used between file path names)
branches (AND operation is used between filePaths, branches, and tags)
includes (AND operation is used between includes and excludes)
BRANCH/**", "BRANCH2/** (OR operation is used between branch names)
excludes (AND operation is used between includes and excludes)
BRANCH/**", "BRANCH2/** (OR operation is used between branch names)
tags (AND operation is used between filePaths, branches, and tags)
includes (AND operation is used between includes and excludes)
TAG/**", "TAG2/** (OR operation is used between tag names)
excludes (AND operation is used between includes and excludes)
TAG/**", "TAG2/** (OR operation is used between tag names)

Event type pull request fields for include and exclude

Include and exclude behavior for levels of Git configuration fields for **pull request** event types are shown in the following list:

```
pullRequest (OR operation is used between push and pullRequest or multiples)
    events (AND operation is used between events, filePaths, and branches). Includes/
excludes are N/A for pull request events.
    filePaths (AND operation is used between events, filePaths, and branches)
        includes (AND operation is used between includes and excludes)
            **/FILE.md, **/FILE2 (OR operation is used between file path names)
        excludes (AND operation is used between includes and excludes)
            **/FILE.md, **/FILE2 (OR operation is used between file path names)
    excludes (AND operation is used between events, filePaths, and branches)
    includes (AND operation is used between includes and excludes)
            **/FILE.md, **/FILE2 (OR operation is used between file path names)
    branches (AND operation is used between events, filePaths, and branches)
    includes (AND operation is used between includes and excludes)
        BRANCH/**", "BRANCH2/** (OR operation is used between branch names)
    excludes (AND operation is used between includes and excludes)
        BRANCH/**", "BRANCH2/** (OR operation is used between branch names)
    BRANCH/**", "BRANCH2/** (OR operation is used between branch names)
```

metadata

The pipeline metadata fields are distinct from the pipeline structure and cannot be edited. When you update a pipeline, the date in the updated metadata field changes automatically.

pipelineArn

The Amazon Resource Name (ARN) of the pipeline.

To use the console to view the pipeline ARN instead of the JSON structure, choose your pipeline in the console, and then choose **Settings**. Under the **General** tab, the **Pipeline ARN** field displays.

created

The date and time when the pipeline was created.

updated

The date and time when the pipeline was last updated.

pollingDisabledAt

The date and time when, for a pipeline that is configured for polling for change detection, when polling was disabled.

Pipelines that are inactive for longer than 30 days will have polling disabled for the pipeline.

- Inactive pipelines will have polling disabled after 30 days of no executions.
- Pipelines using EventBridge, CodeStar Connections, or webhooks will not be affected.
- Active pipelines will not be affected.

For more information, see the pollingDisabledAt parameter under <u>PipelineMetadata</u> object in the *CodePipeline API Guide*. For the steps to migrate your pipeline from polling to event-based change detection, see <u>Change Detection Methods</u>.

Stage declaration

The stage level of a pipeline has a basic structure that includes the following parameters and syntax. For more information, see the <u>StageDeclaration</u> object in the *CodePipeline API Guide*.

The following example shows the stage level of the pipeline structure in both JSON and YAML. The example shows two stages named Source and Build. The example contains two conditions, one for onSuccess and one for beforeEntry.

YAML

```
pipeline:
  name: MyPipeline
  roleArn: >-
    arn:aws:iam::ACCOUNT_ID:role/service-role/AWSCodePipelineServiceRole-us-west-2-
MyPipeline
```

```
artifactStore:
    type: S3
    location: amzn-s3-demo-bucket
  stages:
    - name: Source
      actions:
        - name: Source
           . . .
    - name: Build
      actions:
        - name: Build
           . . .
      onSuccess:
        conditions:
        - result: ROLLBACK
          rules:
          - name: DeploymentWindowRule
          . . .
      beforeEntry:
        conditions:
        - result: FAIL
          rules:
          - name: MyLambdaRule
          . . .
  version: 6
metadata:
  pipelineArn: 'arn:aws:codepipeline:us-west-2:ACCOUNT_ID:MyPipeline'
  created: '2019-12-12T06:49:02.733000+00:00'
  updated: '2020-09-10T06:34:07.447000+00:00'
```

JSON



```
}
],
],
"version": 6
},
"metadata": {
    "pipelineArn": "arn:aws:codepipeline:us-west-2:ACCOUNT_ID:MyPipeline",
    "created": "2019-12-12T06:49:02.733000+00:00",
    "updated": "2020-09-10T06:34:07.447000+00:00"
}
```

name

The name of the stage.

actions

The action level of a pipeline has a basic structure that includes the following parameters and syntax. To view parameters and examples, see <u>Action declaration</u>.

conditions

Conditions contain one or more rules that are available in a list of rules in CodePipeline. If all rules in a condition succeed, then the condition is met. You can configure conditions so that when the criteria are not met, the specified result engages.

You can configure the following types of conditions:

- beforeEntry
- onFailure
- onSuccess

For more information and examples, see <u>Configure conditions for a stage</u>.

rules

Each condition has a rule set which is an ordered set of rules that are evaluated together. Therefore, if one rule fails in the condition, then the condition fails. You can override rule conditions at pipeline runtime.

The available rules are provided in the Rule reference. For more information, see the Rule structure reference at <u>Rule structure reference</u>.

Action declaration

The action level of a pipeline has a basic structure that includes the following parameters and syntax. For more information, see the <u>ActionDeclaration</u> object in the *CodePipeline API Guide*.

The following example shows the action level of the pipeline structure in both JSON and YAML.

YAML

```
stages:
  - name: Source
    actions:
      - name: Source
        actionTypeId:
          category: Source
          owner: AWS
          provider: S3
          version: '1'
        runOrder: 1
        configuration:
          PollForSourceChanges: 'false'
          S3Bucket: amzn-s3-demo-bucket
          S3ObjectKey: codedeploy_linux.zip
        outputArtifacts:
          - name: SourceArtifact
        inputArtifacts: []
        region: us-west-2
        namespace: SourceVariables
  - name: Build
    actions:
```

- name: Build actionTypeId: category: Build owner: AWS provider: CodeBuild version: '1' runOrder: 1 configuration: EnvironmentVariables: >-[{"name":"ETag","value":"#{SourceVariables.ETag}","type":"PLAINTEXT"}] ProjectName: my-project outputArtifacts: - name: BuildArtifact inputArtifacts: - name: SourceArtifact region: us-west-2 namespace: BuildVariables runOrder: 1 configuration: CustomData: >-Here are the exported variables from the build action: S3 ETAG: #{BuildVariables.ETag} outputArtifacts: [] inputArtifacts: [] region: us-west-2

JSON

```
"stages": [
    {
        "name": "Source",
        "actions": [
        {
            "name": "Source",
            "actionTypeId": {
                 "category": "Source",
                "owner": "AWS",
                "provider": "S3",
                "version": "1"
        },
```

```
"runOrder": 1,
                         "configuration": {
                             "PollForSourceChanges": "false",
                             "S3Bucket": "amzn-s3-demo-bucket",
                             "S3ObjectKey": "aws-codepipeline-s3-aws-
codedeploy_linux.zip"
                         },
                         "outputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
                         ],
                         "inputArtifacts": [],
                         "region": "us-west-2",
                         "namespace": "SourceVariables"
                     }
                 ]
            },
            {
                 "name": "Build",
                 "actions": [
                     {
                         "name": "Build",
                         "actionTypeId": {
                             "category": "Build",
                             "owner": "AWS",
                             "provider": "CodeBuild",
                             "version": "1"
                         },
                         "runOrder": 1,
                         "configuration": {
                             "EnvironmentVariables": "[{\"name\":\"ETag\",\"value\":
\"#{SourceVariables.ETag}\", \"type\":\"PLAINTEXT\"}]",
                             "ProjectName": "my-build-project"
                         },
                         "outputArtifacts": [
                             {
                                 "name": "BuildArtifact"
                             }
                         ],
                         "inputArtifacts": [
                             {
                                 "name": "SourceArtifact"
                             }
```



For a list of example configuration details appropriate to the provider type, see <u>Valid</u> configuration parameters for each provider type.

The action structure has the following requirements:

- All action names within a stage must be unique.
- A source action is required for each pipeline.
- Source actions that do not use a connection can be configured for change detection or to turn off change detection. See <u>Change Detection Methods</u>.
- This is true for all actions, whether they are in the same stage or in following stages, but the input artifact does not have to be the next action in strict sequence from the action that provided the output artifact. Actions in parallel can declare different output artifact bundles, which are, in turn, consumed by different following actions.
- When you use an Amazon S3 bucket as a deployment location, you also specify an object key. An object key can be a file name (object) or a combination of a prefix (folder path) and file name.
 You can use variables to specify the location name you want the pipeline to use. Amazon S3 deployment actions support the use of the following variables in Amazon S3 object keys.

Using variables in Amazon S3

Variable	Example of console input	Output
datetime	js-application/{datetime}.zip	UTC timestamp in this format: <yyyy>-<mm>-DD>_<hh>-<mm>- <ss> Example:</ss></mm></hh></mm></yyyy>
		js-application/2019-01-10_07-39-57.z ip

Variable	Example of console input	Output
uuid	js-application/{uuid}.zip	The UUID is a globally unique identifie r that is guaranteed to be different from any other identifier. The UUID is in this format (all digits in hexadecim al format): <8-digits>-<4-digits>-4- digits>-<4-digits>-<12-digits> Example: js-application/54a60075-b96 a-4bf3-9013-db3a9EXAMPLE.zip

name

The name of the action.

region

For actions where the provider is an Amazon Web Services service, the Amazon Web Services Region of the resource.

Cross-Region actions use the Region field to designate the Amazon Web Services Region where the actions are to be created. The Amazon resources created for this action must be created in the same Region provided in the region field. You cannot create cross-Region actions for the following action types:

- Source actions
- Actions by third-party providers
- Actions by custom providers

roleArn

The ARN of the IAM service role that performs the declared action. This is assumed through the roleArn that is specified at the pipeline level.

namespace

Actions can be configured with variables. You use the namespace field to set the namespace and variable information for execution variables. For reference information about execution variables and action output variables, see Variables reference.

Note

For Amazon ECR, Amazon S3, or CodeCommit sources, you can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and EventBridge</u> resources, <u>Connecting to Amazon S3 source actions with a source enabled for events</u>, or <u>CodeCommit source actions and EventBridge</u>.

actionTypeId

The action type ID is identified as a combination of the following four fields.

category

The type of action, or step, in the pipeline, such as a source action. Each action type has a specific set of valid action providers. For a list of valid providers by action type, see the <u>Action structure</u> <u>reference</u>.

These are the valid actionTypeId categories (action types) for CodePipeline:

- Source
- Build
- Approval
- Deploy
- Test
- Invoke
- Compute

owner

For all currently supported action types, the only valid owner string is AWS, ThirdParty, or Custom. For the valid owner string for a specific action, see the <u>Action structure reference</u>.

For more information, see the <u>CodePipeline API Reference</u>.

version

The version of the action.

provider

The action provider, such as CodeBuild.

• Valid provider types for an action category depend on the category. For example, for a source action category, a valid provider type is S3, CodeStarSourceConnection, CodeCommit, or Amazon ECR. This example shows the structure for a source action with an S3 provider:

```
"actionTypeId": {
    "category": "Source",
    "owner": "AWS",
    "version": "1",
    "provider": "S3"},
```

InputArtifacts

This field is contains the input artifact structure, if supported for the action category. The input artifact of an action must exactly match the output artifact declared in a preceding action. For example, if a preceding action includes the following declaration:

```
"outputArtifacts": [
    {
        "MyApp"
    }
],
```

and there are no other output artifacts, then the input artifact of a following action must be:

```
"inputArtifacts": [
```

InputArtifacts

```
{
"MyApp"
}
],
```

For example, a source action cannot have input artifacts because it is the first action in the pipeline. However, a source action will always have output artifacts that are processed by the following action. The output artifacts for a source action are the application files from the source repository, zipped and provided through the artifact bucket, that are processed by the following action, such as a CodeBuild action that acts on the application files with build commands.

As an example of actions that cannot have output artifacts, deploy actions do not have output artifacts because these actions are generally the last action in a pipeline.

name

The artifact name for the action's input artifacts.

outputArtifacts

Output artifact names must be unique in a pipeline. For example, a pipeline can include one action that has an output artifact named "MyApp" and another action that has an output artifact named "MyBuiltApp". However, a pipeline cannot include two actions that both have an output artifact named "MyApp".

This field is contains the output artifact structure, if supported for the action category. The output artifact of an action must exactly match the output artifact declared in a preceding action. For example, if a preceding action includes the following declaration:

```
"outputArtifacts": [
    {
        "MyApp"
    }
],
```

and there are no other output artifacts, then the input artifact of a following action must be:

```
"inputArtifacts": [
{
```

User Guide

```
"MyApp"
}
],
```

For example, a source action cannot have input artifacts because it is the first action in the pipeline. However, a source action will always have output artifacts that are processed by the following action. The output artifacts for a source action are the application files from the source repository, zipped and provided through the artifact bucket, that are processed by the following action, such as a CodeBuild action that acts on the application files with build commands.

As an example of actions that cannot have output artifacts, deploy actions do not have output artifacts because these actions are generally the last action in a pipeline.

name

The artifact name for the action's output artifacts.

configuration (by action provider)

The action configuration contains details and parameters appropriate to the provider type. In the section below, the example action configuration parameters are specific to the S3 source action.

The action configuration and input/output artifact limits can vary by action provider. For a list of action configuration examples by action provider, see <u>Action structure reference</u> and the table in <u>Valid configuration parameters for each provider type</u>. The table provides a link to the action reference for each provider type, which lists the configuration parameters for each action in detail. For a table with the input and output artifact limits for each action provider, see <u>Valid input and</u> <u>output artifacts for each action type</u>.

The following considerations apply to working with actions:

- Source actions do not have input artifacts, and deploy actions do not have output artifacts.
- For source action providers that do not use a connection, such as S3, you must use the PollForSourceChanges parameter to specify whether you want your pipeline to start automatically when a change is detected. See <u>Valid settings for the PollForSourceChanges</u> parameter.
- To configure automated change detection to start your pipeline, or to disable change detection, see <u>Source actions and change detection methods</u>.

- To configure triggers with filtering, use the source action for connections, and then see <u>Automate</u> starting pipelines using triggers and filtering.
- For the output variables for each action, see Variables reference.

Note

For Amazon ECR, Amazon S3, or CodeCommit sources, you can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and</u> <u>EventBridge resources</u>, <u>Connecting to Amazon S3 source actions with a source enabled</u> for events, or CodeCommit source actions and EventBridge.

A Important

Pipelines that are inactive for longer than 30 days will have polling disabled for the pipeline. For more information, see <u>pollingDisabledAt</u> in the pipeline structure reference. For the steps to migrate your pipeline from polling to event-based change detection, see Change Detection Methods.

Note

The CodeCommit and S3 source actions require either a configured change detection resource (an EventBridge rule) or use the option to poll the repository for source changes. For pipelines with a Bitbucket, GitHub, or GitHub Enterprise Server source action, you do not have to set up a webhook or default to polling. The connections action manages change detection for you.

runOrder

A positive integer that indicates the run order of the action within the stage. Parallel actions in the stage are shown as having the same integer. For example, two actions with a run order of two will run in parallel after the first action in the stage runs.

The default runOrder value for an action is 1. The value must be a positive integer (natural number). You cannot use fractions, decimals, negative numbers, or zero. To specify a serial sequence of actions, use the smallest number for the first action and larger numbers for each of the rest of the actions in sequence. To specify parallel actions, use the same integer for each action you want to run in parallel. In the console, you can specify a serial sequence for an action by choosing **Add action group** at the level in the stage where you want it to run, or you can specify a parallel sequence by choosing **Add action**. *Action group* refers to a run order of one or more actions at the same level.

For example, if you want three actions to run in sequence in a stage, you would give the first action the runOrder value of 1, the second action the runOrder value of 2, and the third the runOrder value of 3. However, if you want the second and third actions to run in parallel, you would give the first action the runOrder value of 1 and both the second and third actions the runOrder value of 2.

🚯 Note

The numbering of serial actions do not have to be in strict sequence. For example, if you have three actions in a sequence and decide to remove the second action, you do not need to renumber the runOrder value of the third action. Because the runOrder value of that action (3) is higher than the runOrder value of the first action (1), it runs serially after the first action in the stage.

Valid action providers in CodePipeline

The pipeline structure format is used to build actions and stages in a pipeline. An action type consists of an action category and provider type.

Each action category has a valid list of action providers. To reference the valid action providers for each action category, see the Action structure reference.

Each action category has a designated set of providers. Each action provider, such as Amazon S3, has a provider name, such as S3, that must be used in the Provider field in the action category in your pipeline structure.

There are three valid values for the Owner field in the action category section in your pipeline structure: AWS, ThirdParty, and Custom.

To find the provider name and owner information for your action provider, see the <u>Action structure</u> reference or Valid input and output artifacts for each action type.

This table lists valid providers by action type.

i Note

For Bitbucket, GitHub, or GitHub Enterprise Server actions, refer to the <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server,</u> <u>GitLab.com, and GitLab self-managed actions</u> action reference topic.

Valid action providers by action type

Action category	Valid action providers	Pipeline type supported	Action reference
Source	Amazon S3	V1, V2	Amazon S3 source action reference
	Amazon ECR	V1, V2	Amazon ECR source action reference
	CodeCommit	V1, V2	CodeCommit source action reference
	CodeStarSourceConnection (for Bitbucket, GitHub, GitHub Enterprise Server actions)	V1, V2	CodeStarSourceConn ection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com, and GitLab self-managed actions
Build	Amazon ECR ECRBuildA ndPublish action	V2 only	ECRBuildA ndPublish build action reference
	CodeBuild	V1, V2	Amazon CodeBuild build and test action reference

Action category	Valid action providers	Pipeline type supported	Action reference
	Commands action (see Compute)	V2 only	
	Custom CloudBees	V1, V2	Valid input and output artifacts for each action type
	Custom Jenkins	V1, V2	Valid input and output artifacts for each action type
	Custom TeamCity	V1, V2	Valid input and output artifacts for each action type
Test	CodeBuild	V1, V2	Amazon CodeBuild build and test action reference
	Amazon Device Farm	V1, V2	Valid input and output artifacts for each action type
	Custom BlazeMeter	V1, V2	Valid input and output artifacts for each action type
	ThirdParty GhostInspector		Valid input and output artifacts for each action type
	Custom Jenkins		Valid input and output artifacts for each action type

Action category	Valid action providers	Pipeline type supported	Action reference
	ThirdParty Micro Focus StormRunner Load		Valid input and output artifacts for each action type
	ThirdParty Nouvola		Valid input and output artifacts for each action type
	ThirdParty Runscope		Valid input and output artifacts for each action type
Deploy	Amazon S3		Amazon S3 deploy action reference
	Amazon CloudFormation		Amazon CloudFormation deploy action reference
	CodeDeploy		Valid input and output artifacts for each action type
	EC2 Deploy action	V2 only	Amazon EC2 action reference
	Amazon ECS		Valid input and output artifacts for each action type
	Amazon ECS (Blue/Green) (this is the CodeDeplo yToECS action)		Valid input and output artifacts for each action type
	Amazon EKS action	V2 only	Amazon Elastic Kubernetes Service EKS deploy action reference

Action category	Valid action providers	Pipeline type supported	Action reference
	Elastic Beanstalk		Valid input and output artifacts for each action type
	Amazon AppConfig		Amazon AppConfig deploy action reference
	Amazon OpsWorks		Valid input and output artifacts for each action type
	Service Catalog		Valid input and output artifacts for each action type
	Amazon Alexa		Valid input and output artifacts for each action type
	Custom XebiaLabs		Valid input and output artifacts for each action type
Approval	Manual		Valid input and output artifacts for each action type
Invoke	CodePipeline Invoke action		Amazon CodePipeline invoke action reference
	Amazon Lambda		Amazon Lambda invoke action reference
	Amazon Step Functions		Amazon Step Functions invoke action reference

Action category	Valid action providers	Pipeline type supported	Action reference
	InspectorScan		Amazon Inspector InspectorScan invoke action reference
Compute	Commands action		Commands action reference

Some action types in CodePipeline are available in select Amazon Regions only. It is possible that an action type is available in an Amazon Region, but an Amazon provider for that action type is not available.

For more information about each action provider, see Integrations with CodePipeline action types.

Valid settings for the PollForSourceChanges parameter

The PollForSourceChanges parameter default is determined by the method used to create the pipeline, as described in the following table. In many cases, the PollForSourceChanges parameter defaults to true and must be disabled.

When the PollForSourceChanges parameter defaults to true, you should do the following:

- Add the PollForSourceChanges parameter to the JSON file or Amazon CloudFormation template.
- Create change detection resources (CloudWatch Events rule, as applicable).
- Set the PollForSourceChanges parameter to false.

🚯 Note

If you create a CloudWatch Events rule or webhook, you must set the parameter to false to avoid triggering the pipeline more than once.

The PollForSourceChanges parameter is not used for Amazon ECR source actions.

• PollForSourceChanges parameter defaults

Source	Creation method	Example "configuration" JSON structure output
CodeCommit	Pipeline is created with the console (and change detection resources are created by the console). The parameter is displayed in the pipeline structure output and defaults to false.	<pre>BranchName": "main", "PollForSourceCha nges": "false", "RepositoryName": "my- repo"</pre>
	Pipeline is created with the CLI or Amazon CloudFormation, and the PollForSo urceChanges parameter is not displayed in JSON output, but it sets to true. ²	BranchName": "main", "RepositoryName": "my- repo"
Amazon S3	Pipeline is created with the console (and change detection resources are created by the console). The parameter is displayed in the pipeline structure output and defaults to false.	<pre>"S3Bucket": "my-bucke t", "S3ObjectKey": "object.zip", "PollForSourceChanges" : "false"</pre>
	Pipeline is created with the CLI or Amazon CloudFormation, and the PollForSo urceChanges parameter is not displayed in JSON output, but it sets to true. ²	"S3Bucket": "my-bucke t", "S3ObjectKey": "object.zip"
GitHub	Pipeline is created with the console (and change detection resources are created by the console). The parameter is displayed in the pipeline structure output and defaults to false.	<pre>"Owner": "MyGitHubA ccountName ", "Repo": " MyGitHubR epositoryName " "PollForSourceCh anges": "false", "Branch": " main" "OAuthToken": " ****"</pre>

Source	Creation method	Example "configuration" JSON structure output
	Pipeline is created with the CLI or Amazon CloudFormation, and the PollForSo urceChanges parameter is not displayed in JSON output, but it sets to true. ²	<pre>"Owner": "MyGitHubA ccountName ", "Repo": "MyGitHubR epositoryName ", "Branch": " main", "OAuthToken": " ****"</pre>
	² If PollForSourceChanges has been add structure or the Amazon CloudFormation temp	
	"PollForSourceChanges": "true",	
	³ For information about the change detection r source provider, see Change Detection Method	

Valid input and output artifacts for each action type

Depending on the action type and provider, you can have the following number of input and output artifacts.

Action type constraints for artifacts

Owner	Type of action	Provider	Valid number of input artifacts	Valid number of output artifacts
AWS	Source	S3	0	1
AWS	Source	CodeCommit	0	1
AWS	Source	ECR	0	1
ThirdParty	Source	CodeStarS ourceConn ection	0	1

Amazon CodePipeline

Owner	Type of action	Provider	Valid number of input artifacts	Valid number of output artifacts
AWS	Build	CodeBuild	1 to 5	0 to 5
AWS	Test	CodeBuild	1 to 5	0 to 5
AWS	Test	DeviceFarm	1	0
AWS	Approval	ThirdParty	0	0
AWS	Deploy	S3	1	0
AWS	Deploy	CloudForm ation	0 to 10	0 to 1
AWS	Deploy	CodeDeploy	1	0
AWS	Deploy	ElasticBe anstalk	1	0
AWS	Deploy	OpsWorks	1	0
AWS	Deploy	ECS	1	0
AWS	Deploy	ServiceCa talog	1	0
AWS	Invoke	Lambda	0 to 5	0 to 5
ThirdParty	Deploy	AlexaSkil lsKit	1 to 2	0
Custom	Build	Jenkins	0 to 5	0 to 5
Custom	Test	Jenkins	0 to 5	0 to 5
Custom	Any supported category	As specified in the custom action	0 to 5	0 to 5

Valid configuration parameters for each provider type

This section lists valid configuration parameters for each action provider.

Every action must have a valid action configuration, which depends on the provider type for that action. The following table lists the required action configuration elements for each valid provider type:

Action configuration properties for provider types

Name of provider	Provider name in action type	Configuration properties	Required/ Optional
Amazon S3 (Deploy action provider)	For more information, including examples related to Amazon S3 Deploy action parameters, see <u>Amazon S3 deploy action reference</u> .		
Amazon S3 (Source action provider)		including examples related to Amazor on S3 source action reference.	1 S3 source action
Amazon ECR	For more information, including examples related to Amazon ECR parameters, see <u>Amazon ECR source action reference</u> .		
CodeCommi t	For more information, including examples related to CodeCommit parameters, see <u>CodeCommit source action reference</u> .		
CodeStarS ourceConn ection action for Bitbucket , GitHub (via GitHub app), GHES, and GitLab	For more information, Configuration parame	including examples of the action conf <u>ters</u> .	guration, see

Name of provider	Provider name in action type	Configuration properties	Required/ Optional	
GitHub (via OAuth app)	For more information, including examples related to GitHub parameters, see <u>GitHub (via OAuth app) source action reference</u> . This is the Version 1 GitHub action.			
Amazon CloudForm ation	For more information, including examples related to Amazon CloudFormation parameters, see <u>Amazon CloudFormation deploy action reference</u> .			
CodeBuild	For more description and examples related to CodeBuild parameters, see <u>Amazon</u> <u>CodeBuild build and test action reference</u> .			
CodeDeploy	For more description and examples related to CodeDeploy parameters, see <u>Amazon CodeDeploy deploy action reference</u> .			
Amazon Device Farm	For more description and examples related to Amazon Device Farm parameters, see <u>Amazon Device Farm test action reference</u> .			
Amazon Elastic Beanstalk	ElasticBe anstalk	ApplicationName	Required	
		EnvironmentName	Required	
Amazon Lambda	For more information, including examples related to Amazon Lambda parameter s, see <u>Amazon Lambda invoke action reference</u> .			
Amazon OpsWorks Stacks	OpsWorks	Stack	Required	
		Layer	Optional	
		Арр	Required	
Amazon ECS				

Name of provider	Provider name in action type	Configuration properties	Required/ Optional	
Amazon ECS and CodeDeplo y(Blue/Gr een)	For more description and examples related to Amazon ECS and CodeDeploy blue/green parameters, see <u>Amazon Elastic Container Service and CodeDeploy</u> <u>blue-green deploy action reference</u> .			
Service Catalog	ServiceCatalog	TemplateFilePath	Required	
		ProductVersionName	Required	
		ProductType	Required	
		ProductVersionDescription	Optional	
		ProductId	Required	
Alexa Skills Kit	AlexaSkillsKit	ClientId	Required	
		ClientSecret	Required	
		RefreshToken	Required	
		SkillId	Required	
Jenkins	The name of the action you provided in the CodePipeline Plugin for Jenkins (for example, <i>MyJenkins</i> <i>ProviderName</i>)	ProjectName	Required	
Manual Approval	Manual	CustomData	Optional	
		ExternalEntityLink	Optional	
		NotificationArn	Optional	

The following example shows a valid configuration for a deploy action that uses Alexa Skills Kit:

```
"configuration": {
   "ClientId": "amzn1.application-oa2-client.aadEXAMPLE",
   "ClientSecret": "****",
   "RefreshToken": "****",
   "SkillId": "amzn1.ask.skill.22649d8f-0451-4b4b-9ed9-bfb6cEXAMPLE"
}
```

The following example shows a valid configuration for a manual approval:

```
"configuration": {
    "CustomData": "Comments on the manual approval",
    "ExternalEntityLink": "http://my-url.com",
    "NotificationArn": "arn:aws:sns:us-west-2:12345EXAMPLE:Notification"
}
```

Action structure reference

This section is a reference for action configuration only. For a conceptual overview of the pipeline structure, see CodePipeline pipeline structure reference.

Each action provider in CodePipeline uses a set of required and optional configuration fields in the pipeline structure. This section provides the following reference information by action provider:

- Valid values for the ActionType fields included in the pipeline structure action block, such as Owner and Provider.
- Descriptions and other reference information for the Configuration parameters (required and optional) included in the pipeline structure action section.
- Valid example JSON and YAML action fields.

This section is updated periodically with more action providers. Reference information is currently available for the following action providers:

Topics

- Amazon EC2 action reference
- <u>Amazon ECR source action reference</u>
- ECRBuildAndPublish build action reference
- Amazon Elastic Container Service and CodeDeploy blue-green deploy action reference
- Amazon Elastic Container Service deploy action reference
- Amazon Elastic Kubernetes Service EKS deploy action reference
- <u>Amazon Lambda deploy action reference</u>
- <u>Amazon S3 deploy action reference</u>
- <u>Amazon S3 source action reference</u>
- <u>Amazon AppConfig deploy action reference</u>
- <u>Amazon CloudFormation deploy action reference</u>
- Amazon CloudFormation StackSets deploy action reference
- Amazon CodeBuild build and test action reference
- Amazon CodePipeline invoke action reference
- <u>CodeCommit source action reference</u>

User Guide

- <u>Amazon CodeDeploy deploy action reference</u>
- <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed actions
- <u>Commands action reference</u>
- <u>Amazon Device Farm test action reference</u>
- Elastic Beanstalk deploy action reference
- Amazon Inspector InspectorScan invoke action reference
- Amazon Lambda invoke action reference
- <u>Amazon OpsWorks deploy action reference</u>
- Amazon Service Catalog deploy action reference
- Amazon Step Functions invoke action reference

Amazon EC2 action reference

You use an Amazon EC2 EC2 action to deploy application code to your deployment fleet. Your deployment fleet can consist of Amazon EC2 Linux instances or Linux SSM-managed nodes. Your instances must have the SSM agent installed.

🚯 Note

This action supports Linux instance types only. The maximum fleet size supported is 500 instances.

The action will choose a number of instances based on a specified maximum. The failed instances from previous instances will be chosen first. The action will skip the deployment on certain instances if the instance has already received deployment of the same input artifact, such as a case where the action failed previously.

🚺 Note

This action is only supported for V2 type pipelines.

Topics

Amazon EC2 action reference

- Action type
- Configuration parameters
- Input artifacts
- Output artifacts
- Service role policy permissions for the EC2 deploy action
- Deploy spec file reference
- Action declaration
- Action declaration with Deploy spec example
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: EC2
- Version: 1

Configuration parameters

InstanceTagKey

Required: Yes

The tag key of the instances that you created in Amazon EC2, such as Name.

InstanceTagValue

Required: No

The tag value of the instances that you created in Amazon EC2, such as my-instances.

When this value is not specified, all instances with **InstanceTagKey** will be matched.

InstanceType

Required: Yes

The type of instances or SSM nodes created in Amazon EC2. The valid values are EC2 and SSM_MANAGED_NODE.

You must have already created, tagged, and installed the SSM agent on all instances.

Note

When you create the instance, you create or use an existing EC2 instance role. To avoid Access Denied errors, you must add S3 bucket permissions to the instance role to give the instance permissions to the CodePipeline artifact bucket. Create a default role or update your existing role with the s3:GetObject permission scoped down to the artifact bucket for your pipeline's Region.

TargetDirectory

Required: Yes (If script is specified)

The directory to be used on your Amazon EC2 instance to run scripts.

DeploySpec

Required: Yes (If deploy spec is specified)

The file to be used to configure deployment install and lifecycle events. For deploy spec field descriptions and information, see <u>Deploy spec file reference</u>. To view an action configuration with the deploy spec file specified, see the example in <u>Action declaration with Deploy spec</u> <u>example</u>.

MaxBatch

Required: No

The maximum number of instances allowed to deploy in parallel.

MaxError

Required: No

The maximum number of instance errors allowed during deployment.

TargetGroupNameList

Required: No

Configuration parameters

The list of target group names for deployment. You must have already created the target groups.

Target groups provide a set of instances to process specific requests. If the target group is specified, instances will be removed from the target group before deployment and added back to the target group after deployment.

PreScript

Required: No

The script to be run before the action Deploy phase.

PostScript

Required: Yes

The script to be run after the action Deploy phase.

The following image shows an example of the **Edit** page for the action where **Use action configurations** is chosen.

SourceArtifact X Defined by: Source					
No more than 100 characters					
Instance type					
Choose the instance type that you want to deploy to. Supported types are Amazon EC2 instances or AWS Systems Manag	er (SSM) managed nodes. You must have already created, tagged, and installed the SSM agent on all instances.				
EC2	▼				
You can add one group of tags for EC2 instances to this deployment group.					
One tag group: Any instance identified by the tag group will be deployed to.					
Key	Value - optional				
Q Name X	Q ec2 X				
Matching instances					
1 unique matched instance. Click here for details 🖸					
Deploy specifications					
• Use action configurations Store deploy specifications as action configurations	Use a DeploySpec file Store deploy specifications in a YAML-formatted DeploySpec file				
Target directory Specify the location of the target directory you want to deploy to. Use an absolute path like '/home/ec2-user/deploy'.					
/home/ec2-user/testhelloworld					
PreScript - optional					
Path to the executable script file that runs BEFORE the Deploy event. It should be relative to the root directory of your up	loaded source artifact. Use a relative path like 'uploadDir/preScript.sh'.				
PostScript					
Path to the executable script file that runs AFTER the Deploy event. It should be relative to the root directory of your uploaded source artifact. Use a relative path like 'uploadDir/postScript.sh'.					
test/script.sh					

The following image shows an example of the **Edit** page for the action where **Use a DeploySpec file** is chosen.

Action name Choose a name for your action	
Deploy	1
No more than 100 characters]
Action provider	1
Amazon EC2]
Region	_
United States (N. Virginia)	
Input artifacts	
Choose an input artifact for this action. Learn more 🖸	1
▼	
SourceArtifact 🗙	
Defined by: Source	
No more than 100 characters	
Instance type	ed to enail and installed the CCM second on all instances
Choose the instance type that you want to deploy to. Supported types are Amazon EC2 instances or AWS Systems Manager (SSM) managed nodes. You must have already created and the second s	ed, tagged, and installed the SSM agent on all instances.
EC2	
You can add one group of tags for EC2 instances to this deployment group.	
One tag group: Any instance identified by the tag group will be deployed to.	
Key Value - optional	_
Q Name X Q	
Matching instances	
1 unique matched instance. Click here for details [2]	
Deploy specifications	
Use action configurations Use a DeploySpec file	
Store deploy specifications as action configurations Store deploy specifications in a YAML-formatted DeploySpec file	
DeploySpec	
Path to the deploy specification file. It should be relative to the root directory of your uploaded source artifact.	
deployspec.yaml]
▼ Advanced	
Max batch - optional Specify the number or percentage of targets that can deploy in parallel.	
• targets	
) percentage	
targets: from 1 to the number of instances you have	1
]
Max errors - optional	
Stop the task after the task fails on the specified number or percentage of targets.	
targets	
⊖ percentage	
	Cancel Done

Input artifacts

• Number of artifacts: 1

• Description: The files provided, if any, to support the script actions during the deployment.

Output artifacts

- Number of artifacts: 0
- Description: Output artifacts do not apply for this action type.

Service role policy permissions for the EC2 deploy action

When CodePipeline runs the action, CodePipeline service role requires the following permissions, appropriately scoped down for access with least privilege.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "StatementWithAllResource",
            "Effect": "Allow",
            "Action": [
                "ec2:DescribeInstances",
                "elasticloadbalancing:DescribeTargetGroupAttributes",
                "elasticloadbalancing:DescribeTargetGroups",
                "elasticloadbalancing:DescribeTargetHealth",
                "ssm:CancelCommand",
                "ssm:DescribeInstanceInformation",
                "ssm:ListCommandInvocations"
            ],
            "Resource": [
                "*"
            ]
        },
        {
            "Sid": "StatementForLogs",
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogGroup",
                "logs:CreateLogStream",
                "logs:PutLogEvents"
            ],
            "Resource": [
```

```
"arn:aws:logs:{{region}}:{{AccountId}}:log-group:/aws/codepipeline/
{{pipelineName}}:*"
            1
        },
        {
            "Sid": "StatementForElasticloadbalancing",
            "Effect": "Allow",
            "Action": [
                "elasticloadbalancing:DeregisterTargets",
                "elasticloadbalancing:RegisterTargets"
            ],
            "Resource": [
                "arn:aws:elasticloadbalancing:{{region}}:{{AccountId}}:targetgroup/
[[targetGroupName]]/*"
            1
        },
        {
            "Sid": "StatementForSsmOnTaggedInstances",
            "Effect": "Allow",
            "Action": [
                "ssm:SendCommand"
            ],
            "Resource": [
                "arn:aws:ec2:{{region}}:{{AccountId}}:instance/*"
            ],
            "Condition": {
                "StringEquals": {
                    "aws:ResourceTag/{{tagKey}}": "{{tagValue}}"
                }
            }
        },
        {
            "Sid": "StatementForSsmApprovedDocuments",
            "Effect": "Allow",
            "Action": [
                "ssm:SendCommand"
            ],
            "Resource": [
                "arn:aws:ssm:{{region}}::document/AWS-RunPowerShellScript",
                "arn:aws:ssm:{{region}}::document/AWS-RunShellScript"
            ]
        }
    1
```

Log groups for your pipeline in CloudWatch logs

When CodePipeline runs the action, CodePipeline creates a log group using the name of the pipeline as follows. This enables you to scope down permissions to log resources using the pipeline name.

/aws/codepipeline/MyPipelineName

The following permissions for logging are included in the above updates for the service role.

- logs:CreateLogGroup
- logs:CreateLogStream
- logs:PutLogEvents

To view logs in the console using the action details dialog page, the permission to view logs must be added to the console role. For more information, see the console permissions policy example in Permissions required to view compute logs in the CodePipeline console.

Service role policy permissions for CloudWatch logs

When CodePipeline runs the action, CodePipeline creates a log group using the name of the pipeline as follows. This enables you to scope down permissions to log resources using the pipeline name.

/aws/codepipeline/MyPipelineName

To view logs in the console using the action details dialog page, the permission to view logs must be added to the console role. For more information, see the console permissions policy example in Permissions required to view compute logs in the CodePipeline console.

Deploy spec file reference

When CodePipeline runs the action, you can specify a spec file to configure deployment to your instances. The deploy spec file specifies what to install and which lifecycle event hooks to run in response to deployment lifecycle events. The deploy spec file is always YAML-formatted. The deploy spec file is used to:

- Map the source files in your application revision to their destinations on the instance.
- Specify custom permissions for deployed files.
- Specify scripts to be run on each instance at various stages of the deployment process.

The deploy spec file supports specific deployment configuration parameters supported by CodeDeploy with the AppSpec file. You can use your existing AppSpec file directly, and any unsupported parameters will be ignored. For more information about the AppSpec file in CodeDeploy, see the Application Specification file reference in the *CodeDeploy User Guide*.

The file deployment parameters are specified as follows.

- files The deploy spec file designates the source: and destination: for the deployment files.
- scripts The scripted events for the deployment. Two events are supported: BeforeDeploy and AfterDeploy.
- hooks The lifecycle hooks for the event. The following hooks are supported: ApplicationStop, BeforeInstall, AfterInstall, ApplicationStart, and ValidateService.

Note

The hooks parameter is available for AppSpec compatibility with CodeDeploy and is only available in version 0.0 (AppSpec format). For this format, CodePipeline will perform a best effort mapping of the events.

Correct YAML spacing must be used in the spec file; otherwise, an error is raised if the locations and number of spaces in a deploy spec file are not correct. For more information about spacing, see the YAML specification.

An example deploy spec file is below.

```
version: 0.1
files:
    - source: /index.html
    destination: /var/www/html/
scripts:
    BeforeDeploy:
```

```
User Guide
```

```
    location: scripts/install_dependencies
timeout: 300
runas: myuser
    AfterDeploy:

            location: scripts/start_server
timeout: 300
runas: myuser
```

To view an action configuration with the deploy spec file specified, see the example in <u>Action</u> declaration with Deploy spec example.

Action declaration

YAML

```
name: DeployEC2
actions:
- name: EC2
 actionTypeId:
    category: Deploy
    owner: AWS
    provider: EC2
    version: '1'
  runOrder: 1
  configuration:
    InstanceTagKey: Name
    InstanceTagValue: my-instances
    InstanceType: EC2
    PostScript: "test/script.sh",
    TargetDirectory: "/home/ec2-user/deploy"
  outputArtifacts: []
  inputArtifacts:
  - name: SourceArtifact
  region: us-east-1
```

JSON

```
{
    "name": "DeployEC2",
    "actions": [
        {
            "name": "EC2Deploy",
            "name": "EC2Deploy",
```



Action declaration with Deploy spec example

YAML

```
name: DeployEC2
actions:
- name: EC2
actionTypeId:
   category: Deploy
   owner: AWS
   provider: EC2
   version: '1'
runOrder: 1
   configuration:
    DeploySpec: "deployspec.yaml"
    InstanceTagKey: Name
    InstanceTagValue: my-instances
```

```
InstanceType: EC2
outputArtifacts: []
inputArtifacts:
    name: SourceArtifact
region: us-east-1
```

JSON

```
{
    "name": "DeployEC2",
    "actions": [
        {
            "name": "EC2Deploy",
            "actionTypeId": {
                "category": "Deploy",
                "owner": "AWS",
                "provider": "EC2",
                "version": "1"
            },
            "runOrder": 1,
            "configuration": {
                "DeploySpec": "deployspec.yaml",
                "InstanceTagKey": "Name",
                "InstanceTagValue": "my-instances",
                "InstanceType": "EC2"
            },
            "outputArtifacts": [],
            "inputArtifacts": [
                {
                     "name": "SourceArtifact"
                }
            ],
            "region": "us-east-1"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

- <u>Tutorial: Deploy to Amazon EC2 instances with CodePipeline</u> This tutorial walks you through the creation of a EC2 instances where you will deploy a script file, along with creation of the pipeline using the EC2 action.
- <u>EC2 Deploy action fails with an error message No such file</u> This topic describes troubleshooting for file not found errors with the EC2 action.

Amazon ECR source action reference

Triggers the pipeline when a new image is pushed to the Amazon ECR repository. This action provides an image definitions file referencing the URI for the image that was pushed to Amazon ECR. This source action is often used in conjunction with another source action, such as CodeCommit, to allow a source location for all other source artifacts. For more information, see Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment.

When you use the console to create or edit your pipeline, CodePipeline creates an EventBridge rule that starts your pipeline when a change occurs in the repository.

Note

For Amazon ECR, Amazon S3, or CodeCommit sources, you can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and EventBridge</u> resources, <u>Connecting to Amazon S3 source actions with a source enabled for events</u>, or CodeCommit source actions and EventBridge.

You must have already created an Amazon ECR repository and pushed an image before you connect the pipeline through an Amazon ECR action.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts

- Output variables
- Service role permissions: Amazon ECR action
- Action declaration (Amazon ECR example)
- See also

Action type

- Category: Source
- Owner: AWS
- Provider: ECR
- Version: 1

Configuration parameters

RepositoryName

Required: Yes

The name of the Amazon ECR repository where the image was pushed.

ImageTag

Required: No

The tag used for the image.

Note

If a value for ImageTag is not specified, the value defaults to latest.

Input artifacts

- Number of artifacts: 0
- **Description:** Input artifacts do not apply for this action type.

Output artifacts

- Number of artifacts: 1
- **Description:** This action produces an artifact that contains an imageDetail.json file that contains the URI for the image that triggered the pipeline execution. For information about the imageDetail.json file, see <u>imageDetail.json file for Amazon ECS blue/green deployment</u> actions.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information, see <u>Variables reference</u>.

RegistryId

The Amazon account ID associated with the registry that contains the repository.

RepositoryName

The name of the Amazon ECR repository where the image was pushed.

ImageTag

The tag used for the image.

1 Note

The ImageTag output variable is not output when the source revision is overridden

ImageDigest

The sha256 digest of the image manifest.

ImageURI

The URI for the image.

Service role permissions: Amazon ECR action

For Amazon ECR support, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": [
        "ecr:DescribeImages"
    ],
    "Resource": "resource_ARN"
},
```

For more information about this action, see <u>Amazon ECR source action reference</u>.

Action declaration (Amazon ECR example)

YAML

```
Name: Source
Actions:
  - InputArtifacts: []
  ActionTypeId:
    Version: '1'
    Owner: AWS
    Category: Source
    Provider: ECR
    OutputArtifacts:
        - Name: SourceArtifact
    RunOrder: 1
    Configuration:
        ImageTag: latest
        RepositoryName: my-image-repo
    Name: ImageSource
```

JSON

```
"ActionTypeId": {
                 "Version": "1",
                 "Owner": "AWS",
                 "Category": "Source",
                 "Provider": "ECR"
            },
             "OutputArtifacts": [
                 {
                     "Name": "SourceArtifact"
                 }
            ],
            "RunOrder": 1,
            "Configuration": {
                 "ImageTag": "latest",
                 "RepositoryName": "my-image-repo"
            },
            "Name": "ImageSource"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

• Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment

 This tutorial provides a sample app spec file and sample CodeDeploy application and deployment group to create a pipeline with a CodeCommit and Amazon ECR source that deploys to Amazon ECS instances.

ECRBuildAndPublish build action reference

This build action allows you to automate building and pushing a new image when a change occurs in your source. This action builds based on a specified Docker file location and pushes the image. This build action is not the same as the Amazon ECR source action in CodePipeline, which triggers pipeline when a change occurs in your Amazon ECR source repository. For information about that action, see Amazon ECR source action reference.

This is not a source action that will trigger the pipeline. This action builds an image and pushes it to your Amazon ECR image repository.

You must have already created an Amazon ECR repository and have added a Dockerfile to your source code repository, such as GitHub, before you add the action to your pipeline.

<u> Important</u>

This action uses CodePipeline managed CodeBuild compute to run commands in a build environment. Running the commands action will incur separate charges in Amazon CodeBuild.

(i) Note

This action is only available for V2 type pipelines.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: ECRBuildAndPublish action
- Action declaration
- See also

Action type

- Category: Build
- Owner: AWS
- Provider: ECRBuildAndPublish
- Version: 1

Configuration parameters

ECRRepositoryName

Required: Yes

The name of the Amazon ECR repository where the image is pushed.

DockerFilePath

Required: No

The location of the Docker file used to build the image. Optionally, you can provide an alternate docker file location if not at the root level.

Note

If a value for DockerFilePath is not specified, the value defaults to the source repository root level.

ImageTags

Required: No

The tags used for the image. You can enter multiple tags as a comma-delimited list of strings.

Note

If a value for ImageTags is not specified, the value defaults to latest.

RegistryType

Required: No

Specifies whether the repository is public or private. Valid values are private | public.

Note

If a value for RegistryType is not specified, the value defaults to private.

Input artifacts

User Guide

- Number of artifacts: 1
- **Description:** The artifact produced by the source action that contains the Dockerfile needed to build the image.

Output artifacts

Number of artifacts: 0

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information, see Variables reference.

ECRImageDigestId

The sha256 digest of the image manifest.

ECRRepositoryName

The name of the Amazon ECR repository where the image was pushed.

Service role permissions: ECRBuildAndPublish action

For the ECRBuildAndPublish action support, add the following to your policy statement:

```
{
    "Statement": [
        {
          "Sid": "ECRRepositoryAllResourcePolicy",
          "Effect": "Allow",
          "Action": [
          "ecr:DescribeRepositories",
          "ecr:GetAuthorizationToken",
          "ecr-public:DescribeRepositories",
          "ecr-public:DescribeR
```

```
"ecr-public:GetAuthorizationToken"
        ],
    "Resource": "*"
    },
    {
        "Effect": "Allow",
        "Action": [
            "ecr:GetAuthorizationToken",
            "ecr:InitiateLayerUpload",
            "ecr:UploadLayerPart",
            "ecr:CompleteLayerUpload",
            "ecr:PutImage",
            "ecr:GetDownloadUrlForLayer",
            "ecr:BatchCheckLayerAvailability"
        ],
        "Resource": "PrivateECR_Resource_ARN"
    },
    {
        "Effect": "Allow",
        "Action": [
            "ecr-public:GetAuthorizationToken",
            "ecr-public:DescribeRepositories",
            "ecr-public:InitiateLayerUpload",
            "ecr-public:UploadLayerPart",
            "ecr-public:CompleteLayerUpload",
            "ecr-public:PutImage",
            "ecr-public:BatchCheckLayerAvailability",
            "sts:GetServiceBearerToken"
        ],
        "Resource": "PublicECR_Resource_ARN"
    },
    {
        "Effect": "Allow",
        "Action": [
            "sts:GetServiceBearerToken"
        ],
        "Resource": "*"
    }
]
```

In addition, if not already added for the Commands action, add the following permissions to your service role in order to view CloudWatch logs.

}

```
{
    "Effect": "Allow",
    "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
    ],
    "Resource": "resource_ARN"
},
```

i Note

Scope down the permissions to the pipeline resource level by using resource-based permissions in the service role policy statement.

For more information about this action, see <u>ECRBuildAndPublish build action reference</u>.

Action declaration

YAML

```
name: ECRBuild
actionTypeId:
   category: Build
   owner: AWS
   provider: ECRBuildAndPublish
   version: '1'
runOrder: 1
configuration:
   ECRRepositoryName: actions/my-imagerepo
outputArtifacts: []
inputArtifacts:
   name: SourceArtifact
region: us-east-1
namespace: BuildVariables
```

JSON

"name": "ECRBuild",

{

```
"actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "provider": "ECRBuildAndPublish",
        "version": "1"
    },
    "runOrder": 1,
    "configuration": {
        "ECRRepositoryName": "actions/my-imagerepo"
    },
    "outputArtifacts": [],
    "inputArtifacts": [
        {
            "name": "SourceArtifact"
        }
    ],
    "region": "us-east-1",
    "namespace": "BuildVariables"
},
```

See also

The following related resources can help you as you work with this action.

• <u>Tutorial: Build and push a Docker image to Amazon ECR with CodePipeline (V2 type)</u> – This tutorial provides a sample Dockerfile and instructions to create a pipeline that pushes your image to ECR on a change to your source repository and then deploys to Amazon ECS.

Amazon Elastic Container Service and CodeDeploy blue-green deploy action reference

You can configure a pipeline in Amazon CodePipeline that deploys container applications using a blue/green deployment. In a blue/green deployment, you can launch a new version of your application alongside the old version, and you can test the new version before you reroute traffic to it. You can also monitor the deployment process and rapidly roll back if there is an issue.

The completed pipeline detects changes to your images or task definition file and and uses CodeDeploy to route and deploy traffic to an Amazon ECS cluster and load balancer. CodeDeploy creates a new listener on your load balancer which can target your new task through a special port. You can also configure the pipeline to use a source location, such as a CodeCommit repository, where your Amazon ECS task definition is stored.

Before you create your pipeline, you must have already created the Amazon ECS resources, the CodeDeploy resources, and the load balancer and target group. You must have already tagged and stored the image in your image repository, and uploaded the task definition and AppSpec file to your file repository.

🚯 Note

This topic describes the Amazon ECS to CodeDeploy blue/green deployment action for CodePipeline. For reference information about Amazon ECS standard deployment actions in CodePipeline, see <u>Amazon Elastic Container Service deploy action reference</u>.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Service role permissions: CodeDeployToECS action
- <u>Action declaration</u>
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: CodeDeployToECS
- Version: 1

Configuration parameters

ApplicationName

Required: Yes

The name of the application in CodeDeploy. Before you create your pipeline, you must have already created the application in CodeDeploy.

DeploymentGroupName

Required: Yes

The deployment group specified for Amazon ECS task sets that you created for your CodeDeploy application. Before you create your pipeline, you must have already created the deployment group in CodeDeploy.

TaskDefinitionTemplateArtifact

Required: Yes

The name of the input artifact that provides the task definition file to the deployment action. This is generally the name of the output artifact from the source action. When you use the console, the default name for the source action output artifact is SourceArtifact.

AppSpecTemplateArtifact

Required: Yes

The name of the input artifact that provides the AppSpec file to the deployment action. This value is updated when your pipeline runs. This is generally the name of the output artifact from the source action. When you use the console, the default name for the source action output artifact is SourceArtifact. For TaskDefinition in AppSpec file, you can keep the <TASK_DEFINITION> placeholder text as shown <u>here</u>.

AppSpecTemplatePath

Required: No

The file name of the AppSpec file stored in the pipeline source file location, such as your pipeline's CodeCommit repository. The default file name is appspec.yaml. If your AppSpec file has the same name and is stored at the root level in your file repository, you do not need to provide the file name. If the path is not the default, enter the path and file name.

TaskDefinitionTemplatePath

Required: No

The file name of the task definition stored in the pipeline file source location, such as your pipeline's CodeCommit repository. The default file name is taskdef.json. If your task definition file has the same name and is stored at the root level in your file repository, you do not need to provide the file name. If the path is not the default, enter the path and file name.

Image<Number>ArtifactName

Required: No

The name of the input artifact that provides the image to the deployment action. This is generally the image repository's output artifact, such as output from the Amazon ECR source action.

Available values for <Number> are 1 through 4.

Image<Number>ContainerName

Required: No

The name of the image available from the image repository, such as the Amazon ECR source repository.

Available values for <Number> are 1 through 4.

Input artifacts

- Number of Artifacts: 1 to 5
- **Description:** The CodeDeployToECS action first looks for the task definition file and the AppSpec file in the source file repository, next looks for the image in the image repository, then dynamically generates a new revision of task definition, and finallyruns the AppSpec commands to deploy the task set and container to the cluster.

The CodeDeployToECS action looks for an imageDetail.json file that maps the image URI to the image. When you commit a change to your Amazon ECR image repository, the pipeline ECR source action creates an imageDetail.json file for that commit. You can also manually add an imageDetail.json file for a pipeline where the action is not automated. For information about

the imageDetail.json file, see imageDetail.json file for Amazon ECS blue/green deployment actions.

The CodeDeployToECS action dynamically generates a new revision of the task definition. In this phase, this action replaces placeholders in task definition file into image URI retrieved from imageDetail.json files. For example, if you set *IMAGE1_NAME* as Image1ContainerName parameter, you should specify the placeholder *<IMAGE1_NAME>* as the value of image field in your task definition file. In this case, the CodeDeployToECS action replaces the placeholder *<IMAGE1_NAME>* into actual image URI retrieved from imageDetail.json in the artifact which you specify as Image1ArtifactName.

For task definition updates, the CodeDeploy AppSpec.yaml file contains the TaskDefinition property.

TaskDefinition: <TASK_DEFINITION>

This property will be updated by the CodeDeployToECS action after the new task definition is created.

For the value of the TaskDefinition field, the placeholder text must be <TASK_DEFINITION>. The CodeDeployToECS action replaces this placeholder with the actual ARN of the dynamically generated task definition.

Output artifacts

- Number of Artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: CodeDeployToECS action

For the CodeDeployToECS action (blue/green deployments), the following are the minimum permissions needed to create pipelines with a CodeDeploy to Amazon ECS blue/green deployment action.

```
{
    "Version": "2012-10-17",
    "Statement": [
```

```
{
      "Sid": "AllowCodeDeployDeploymentActions",
      "Action": [
        "codedeploy:CreateDeployment",
        "codedeploy:GetDeployment"
      ],
      "Resource": [
        "arn:aws:codedeploy:*:{{customerAccountId}}:deploymentgroup:
[[ApplicationName]]/*"
      ],
      "Effect": "Allow"
   },
    {
      "Sid": "AllowCodeDeployApplicationActions",
      "Action": [
        "codedeploy:GetApplication",
        "codedeploy:GetApplicationRevision",
        "codedeploy:RegisterApplicationRevision"
     ],
      "Resource": [
        "arn:aws:codedeploy:*:{{customerAccountId}}:application:[[ApplicationName]]",
        "arn:aws:codedeploy:*:{{customerAccountId}}:application:[[ApplicationName]]/*"
     ],
     "Effect": "Allow"
   },
    {
      "Sid": "AllowCodeDeployDeploymentConfigAccess",
      "Action": [
        "codedeploy:GetDeploymentConfig"
      ],
      "Resource": [
        "arn:aws:codedeploy:*:{{customerAccountId}}:deploymentconfig:*"
     ],
     "Effect": "Allow"
   },
    {
      "Sid": "AllowECSRegisterTaskDefinition",
      "Action": [
        "ecs:RegisterTaskDefinition"
      ],
      "Resource": [
       "*"
      ],
      "Effect": "Allow"
```

```
User Guide
```

```
},
    {
      "Sid": "AllowPassRoleToECS",
      "Effect": "Allow",
      "Action": "iam:PassRole",
      "Resource": [
        "arn:aws:iam::{{customerAccountId}}:role/[[PassRoles]]"
      ],
      "Condition": {
        "StringEquals": {
          "iam:PassedToService": [
            "ecs.amazonaws.com",
            "ecs-tasks.amazonaws.com"
          ]
        }
      }
    }
  ]
}
```

You can opt in to using tagging authorization in Amazon ECS. By opting in, you must grant the following permissions: ecs:TagResource. For more information about how to opt in and to determine whether the permission is required and tag authorization is enforced, see <u>Tagging</u> <u>authorization timeline</u> in the Amazon Elastic Container Service Developer Guide.

You must also add the iam: PassRole permissions to use IAM roles for tasks. For more information, see <u>Amazon ECS task execution IAM role</u> and <u>IAM Roles for Tasks</u>.

You can also add ecs-tasks.amazonaws.com to the list of services under the iam:PassedToService condition, as shown in the above example.

Action declaration

YAML

```
Name: Deploy
Actions:
   - Name: Deploy
   ActionTypeId:
     Category: Deploy
   Owner: AWS
     Provider: CodeDeployToECS
```

Version: '1' RunOrder: 1 Configuration: AppSpecTemplateArtifact: SourceArtifact ApplicationName: ecs-cd-application DeploymentGroupName: ecs-deployment-group Image1ArtifactName: MyImage Image1ContainerName: IMAGE1_NAME TaskDefinitionTemplatePath: taskdef.json AppSpecTemplatePath: appspec.yaml TaskDefinitionTemplateArtifact: SourceArtifact OutputArtifacts: [] InputArtifacts: - Name: SourceArtifact - Name: MyImage Region: us-west-2 Namespace: DeployVariables

JSON

```
{
    "Name": "Deploy",
    "Actions": [
        {
            "Name": "Deploy",
            "ActionTypeId": {
                "Category": "Deploy",
                "Owner": "AWS",
                "Provider": "CodeDeployToECS",
                "Version": "1"
            },
            "RunOrder": 1,
            "Configuration": {
                "AppSpecTemplateArtifact": "SourceArtifact",
                "ApplicationName": "ecs-cd-application",
                "DeploymentGroupName": "ecs-deployment-group",
                "Image1ArtifactName": "MyImage",
                "Image1ContainerName": "IMAGE1_NAME",
                "TaskDefinitionTemplatePath": "taskdef.json",
                "AppSpecTemplatePath": "appspec.yaml",
                "TaskDefinitionTemplateArtifact": "SourceArtifact"
            },
            "OutputArtifacts": [],
```

```
"InputArtifacts": [
        {
            "Name": "SourceArtifact"
        },
        {
            "Name": "MyImage"
        }
        ],
        "Region": "us-west-2",
        "Namespace": "DeployVariables"
        }
    ]
}
```

See also

The following related resources can help you as you work with this action.

 Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment – This tutorial walks you through creation of the CodeDeploy and Amazon ECS resources you need for a blue/green deployment. The tutorial shows you how to push a Docker image to Amazon ECR and create an Amazon ECS task definition that lists your Docker image name, container name, Amazon ECS service name, and load balancer configuration. The tutorial then walks you through creating the AppSpec file and pipeline for your deployment.

i Note

This topic and tutorial describe the CodeDeploy/ECS blue/green action for CodePipeline. For information about ECS standard actions in CodePipeline, see <u>Tutorial: Continuous</u> <u>Deployment with CodePipeline</u>.

- Amazon CodeDeploy User Guide For information about how to use the load balancer, production listener, target groups, and your Amazon ECS application in a blue/green deployment, see <u>Tutorial: Deploy an Amazon ECS Service</u>. This reference information in the Amazon CodeDeploy User Guide provides an overview for blue/green deployments with Amazon ECS and Amazon CodeDeploy.
- Amazon Elastic Container Service Developer Guide For information about working with Docker images and containers, ECS services and clusters, and ECS task sets, see <u>What Is Amazon ECS?</u>

Amazon Elastic Container Service deploy action reference

You can use an Amazon ECS action to deploy an Amazon ECS service and task set. An Amazon ECS service is a container application that is deployed to an Amazon ECS cluster. An Amazon ECS cluster is a collection of instances that host your container application in the cloud. The deployment requires a task definition that you create in Amazon ECS and an image definitions file that CodePipeline uses to deploy the image.

<u> Important</u>

The Amazon ECS standard deployment action for CodePipeline creates its own revision of the task definition based on the the revision used by the Amazon ECS service. If you create new revisions for the task definition without updating the Amazon ECS service, the deployment action will ignore those revisions.

Before you create your pipeline, you must have already created the Amazon ECS resources, tagged and stored the image in your image repository, and uploaded the BuildSpec file to your file repository.

Note

This reference topic describes the Amazon ECS standard deployment action for CodePipeline. For reference information about Amazon ECS to CodeDeploy blue/green deployment actions in CodePipeline, see <u>Amazon Elastic Container Service and CodeDeploy</u> <u>blue-green deploy action reference</u>.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Service role permissions: Amazon ECS standard action
- Action declaration

• See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: ECS
- Version: 1

Configuration parameters

ClusterName

Required: Yes

The Amazon ECS cluster in Amazon ECS.

ServiceName

Required: Yes

The Amazon ECS service that you created in Amazon ECS.

FileName

Required: No

The name of your image definitions file, the JSON file that describes your service's container name and the image and tag. You use this file for ECS standard deployments. For more information, see <u>Input artifacts</u> and <u>imagedefinitions.json file for Amazon ECS standard deployment actions</u>.

DeploymentTimeout

Required: No

The Amazon ECS deployment action timeout in minutes. The timeout is configurable up to the maximum default timeout for this action. For example:

```
"DeploymentTimeout": "15"
```

Input artifacts

User Guide

- Number of artifacts: 1
- Description: The action looks for an imagedefinitions.json file in the source file repository for the pipeline. An image definitions document is a JSON file that describes your Amazon ECS container name and the image and tag. CodePipeline uses the file to retrieve the image from your image repository such as Amazon ECR. You can manually add an imagedefinitions.json file for a pipeline where the action is not automated. For information about the imagedefinitions.json file, see <u>imagedefinitions.json file for Amazon ECS standard deployment actions</u>.

The action requires an existing image that has already been pushed to your image repository. Because the image mapping is provided by the imagedefinitions.json file, the action does not require that the Amazon ECR source be included as a source action in the pipeline.

Output artifacts

- Number of artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: Amazon ECS standard action

For Amazon ECS, the following are the minimum permissions needed to create pipelines with an Amazon ECS deploy action.

```
{
    "Version": "2012-10-17",
    "Statement": [
        { "Sid": "TaskDefinitionPermissions",
            "Effect": "Allow",
            "Action": [
               "ecs:DescribeTaskDefinition",
               "ecs:RegisterTaskDefinition"
        ],
        "Resource": [
               "*"
        ]
     },
```

```
{ "Sid": "ECSServicePermissions",
      "Effect": "Allow",
      "Action": [
        "ecs:DescribeServices",
        "ecs:UpdateService"
      ],
      "Resource": [
        "arn:aws:ecs:*:{{customerAccountId}}:service/[[clusters]]/*"
      ]
    },
    { "Sid": "ECSTagResource",
      "Effect": "Allow",
      "Action": [
        "ecs:TagResource"
      ],
      "Resource": [
        "arn:aws:ecs:*:{{customerAccountId}}:task-definition/[[taskDefinitions]]:*"
      ],
      "Condition": {
        "StringEquals": {
          "ecs:CreateAction": [
            "RegisterTaskDefinition"
          ]
        }
      }
    },
    { "Sid": "IamPassRolePermissions",
      "Effect": "Allow",
      "Action": "iam:PassRole",
      "Resource": [
        "arn:aws:iam::{{customerAccountId}}:role/[[passRoles]]"
      ],
      "Condition": {
        "StringEquals": {
          "iam:PassedToService": [
            "ecs.amazonaws.com",
            "ecs-tasks.amazonaws.com"
          ]
        }
      }
    }
  ]
}
```

Amazon CodePipeline

You can opt in to using tagging authorization in Amazon ECS. By opting in, you must grant the following permissions: ecs: TagResource. For more information about how to opt in and to determine whether the permission is required and tag authorization is enforced, see <u>Tagging</u> authorization timeline in the Amazon Elastic Container Service Developer Guide.

You must add the iam: PassRole permissions to use IAM roles for tasks. For more information, see Amazon ECS task execution IAM role and IAM Roles for Tasks. Use the following policy text.

Action declaration

YAML

```
Name: DeployECS
ActionTypeId:
  Category: Deploy
  Owner: AWS
  Provider: ECS
  Version: '1'
RunOrder: 2
Configuration:
  ClusterName: my-ecs-cluster
  ServiceName: sample-app-service
  FileName: imagedefinitions.json
  DeploymentTimeout: '15'
OutputArtifacts: []
InputArtifacts:
  - Name: my-image
```

JSON

```
{
    "Name": "DeployECS",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "ECS",
        "Version": "1"
    },
    "RunOrder": 2,
    "Configuration": {
        "ClusterName": "my-ecs-cluster",
        "ServiceName": "sample-app-service",
    }
}
```

```
"FileName": "imagedefinitions.json",
    "DeploymentTimeout": "15"
},
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "my-image"
        }
]
},
```

See also

The following related resources can help you as you work with this action.

- See <u>Tutorial: Build and push a Docker image to Amazon ECR with CodePipeline (V2 type)</u> for a tutorial that shows you how to use the ECRBuildandPublish action to push an image and then use the ECS standard action to deploy to Amazon ECS.
- <u>Tutorial: Continuous Deployment with CodePipeline</u> This tutorial shows you how to create a Dockerfile that you store in a source file repository such as CodeCommit. Next, the tutorial shows you how to incorporate a CodeBuild BuildSpec file that builds and pushes your Docker image to Amazon ECR and creates your imagedefinitions.json file. Finally, you create an Amazon ECS service and task definition, and then you create your pipeline with an Amazon ECS deployment action.

🚯 Note

This topic and tutorial describe the Amazon ECS standard deployment action for CodePipeline. For information about Amazon ECS to CodeDeploy blue/green deployment actions in CodePipeline, see <u>Tutorial: Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment</u>.

 Amazon Elastic Container Service Developer Guide – For information about working with Docker images and containers, Amazon ECS services and clusters, and Amazon ECS task sets, see <u>What Is</u> <u>Amazon ECS?</u>

Amazon Elastic Kubernetes Service EKS deploy action reference

You can use the EKSDeploy action to deploy an Amazon EKS service. The deployment requires a Kubernetes manifest file that CodePipeline uses to deploy the image.

Before you create your pipeline, you must have already created the Amazon EKS resources and have stored the image in your image repository. Optionally, you can provide VPC information for your cluster.

<u> Important</u>

This action uses CodePipeline managed CodeBuild compute to run commands in a build environment. Running the commands action will incur separate charges in Amazon CodeBuild.

🚯 Note

The EKS deploy action is only available for V2 type pipelines.

The EKS action supports both public and private EKS clusters. Private clusters are the type recommended by EKS; however, both types are supported.

The EKS action is supported for cross-account actions. To add a cross-account EKS action, add actionRoleArn from your target account in the action declaration.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Environment variables
- Output variables
- Service role policy permissions
- Action declaration
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: EKS
- Version: 1

Configuration parameters

ClusterName

Required: Yes

The Amazon EKS cluster in Amazon EKS.

Options under Helm

The following are available options when **Helm** is the selected deployment tool.

HelmReleaseName

Required: Yes (Required only for Helm type)

The release name for your deployment.

HelmChartLocation

Required: Yes (Required only for Helm type)

The chart location for your deployment.

HelmValuesFiles

Required: No (Optional only for Helm type)

To override for helm values files, enter the comma-separated helm values files in the helm chart location.

Options under Kubectl

The following are available options when **Kubectl** is the selected deployment tool.

ManifestFiles

Required: Yes (Required only for Kubectl type)

The name of your manifest file, the text file that describes your service's container name and the image and tag. You use this file to parameterize your image URI and other information. You can use environment variable for this purpose.

You store this file in the source repository for your pipeline.

Namespace

Required: No

The kubernetes namepsace to be used in kubectl or helm commands.

Subnets

Required: No

The subnets for the VPC for your cluster. These are part of the same VPC that is attached to your cluster. You can also provide subnets that aren't already attached to your cluster and specify them here.

SecurityGroupIds

Required: No

The security groups for the VPC for your cluster. These are part of the same VPC that is attached to your cluster. You can also provide security groups that aren't already attached to your cluster and specify them here.

Input artifacts

- Number of artifacts: 1
- **Description:** The action looks for the Kubernetes manifest file or Helm chart in the source file repository for the pipeline. If you want to use helm charts in .tgz format stored in an S3 bucket, you can do so by configuring the S3 Bucket/Key as your source action. For example, the object key provided would be my-chart-0.1.0.tgz.

Output artifacts

- Number of artifacts: Ø
- **Description:** Output artifacts do not apply for this action type.

Environment variables

Used to replace variables such as image repositories or image tags in manifest files or helm chart values files.

Key

The key in a key-value environment variable pair, such as \$IMAGE_TAG.

Value

The value for the key-value pair, such as v1.0. The value can be parameterized with output variables from pipeline actions or pipeline variables. For example, pipeline can have an ECRBuildAndPublish action that creates an ECR image with \${codepipeline.PipelineExecutionId}, and the EKS action can use this image using \${codepipeline.PipelineExecutionId} as the value of the environment variable.

Output variables

EKSClusterName

The Amazon EKS cluster in Amazon EKS.

Service role policy permissions

To run this action, the following permissions must be available in your pipeline's service role policy.

• **EC2 actions:** When CodePipeline runs the action EC2 instance permissions are required. Note that this is not the same as the EC2 instance role required when you create your EKS cluster.

If you are using an existing service role, to use this action, you will need to add the following permissions for the service role.

- ec2:CreateNetworkInterface
- ec2:DescribeDhcpOptions
- ec2:DescribeNetworkInterfaces
- ec2:DeleteNetworkInterface
- ec2:DescribeSubnets
- ec2:DescribeSecurityGroups

- ec2:DescribeVpcs
- **EKS actions:** When CodePipeline runs the action, EKS cluster permissions are required. Note that this is not the same as the IAM EKS cluster role required when you create your EKS cluster.

If you are using an existing service role, to use this action, you will need to add the following permission for the service role.

- eks:DescribeCluster
- Log stream actions: When CodePipeline runs the action, CodePipeline creates a log group using the name of the pipeline as follows. This enables you to scope down permissions to log resources using the pipeline name.

/aws/codepipeline/MyPipelineName

If you are using an existing service role, to use this action, you will need to add the following permissions for the service role.

- logs:CreateLogGroup
- logs:CreateLogStream
- logs:PutLogEvents

In the service role policy statement, scope down the permissions to the resource level as shown in the following example.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "eks:DescribeCluster"
            ],
            "Resource": "arn:aws:eks:*:YOUR_AWS_ACCOUNT_ID:cluster/YOUR_CLUSTER_NAME"
        },
        {
            "Effect": "Allow",
            "Action": [
                "ec2:CreateNetworkInterface",
                "ec2:CreateNetworkInterfacePermission",
                "ec2:DescribeDhcpOptions",
```

```
"ec2:DescribeNetworkInterfaces",
                "ec2:DeleteNetworkInterface",
                "ec2:DescribeSubnets",
                "ec2:DescribeSecurityGroups",
                "ec2:DescribeVpcs",
                "ec2:DescribeRouteTables"
            ],
            "Resource": "*"
        },
        {
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogStream",
                "logs:CreateLogGroup",
                "logs:PutLogEvents"
            ],
            "Resource": [ "arn:aws:logs:*:YOUR_AWS_ACCOUNT_ID:log-group:/aws/
codepipeline/YOUR_PIPELINE_NAME", "arn:aws:logs:*:YOUR_AWS_ACCOUNT_ID:log-group:/aws/
codepipeline/YOUR_PIPELINE_NAME:*"]
        },
    ]
}
```

To view logs in the console using the action details dialog page, the permission to view logs must be added to the console role. For more information, see the console permissions policy example in Permissions required to view compute logs in the CodePipeline console.

Adding the service role as an access entry for your cluster

After the permissions are available in your pipeline's service role policy, you configure your cluster permissions by adding the CodePipeline service role as an access entry for your cluster.

You can also use an action role that has the updated permissions. For more information, see the tutorial example in <u>Step 4</u>: Create an access entry for the CodePipeline service role.

Action declaration

YAML

```
Name: DeployEKS
ActionTypeId:
Category: Deploy
```

```
Owner: AWS

Provider: EKS

Version: '1'

RunOrder: 2

Configuration:

ClusterName: my-eks-cluster

ManifestFiles: ManifestFile.json

OutputArtifacts: []

InputArtifacts:

- Name: SourceArtifact
```

JSON

```
{
    "Name": "DeployECS",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "EKS",
        "Version": "1"
    },
    "RunOrder": 2,
    "Configuration": {
        "ClusterName": "my-eks-cluster",
        "ManifestFiles": "ManifestFile.json"
    },
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "SourceArtifact"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

• See <u>Tutorial: Deploy to Amazon EKS with CodePipeline</u> for a tutorial that demonstrates how to create an EKS cluster and Kubernetes manifest file to add the action to your pipeline.

Amazon Lambda deploy action reference

You use an Amazon Lambda deploy action to manage deploying your application code for your serverless deployment. You can deploy a function and use deployment strategies for traffic deployment as follows:

- Canary and linear deployments for traffic shifting
- All at once deployments

🚯 Note

This action is only supported for V2 type pipelines.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Service role policy permissions for the Lambda deploy action
- <u>Action declaration</u>
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: Lambda
- Version: 1

Configuration parameters

FunctionName

Required: Yes

The name of the function that you created in Lambda, such as MyLambdaFunction.

You must have already created a version.

FunctionAlias

Required: No

The alias of the function that you created in Lambda and is the function to be deployed to, such as live. The alias must exist and has one version behind it when the action executions starts. (It will be the rollback target version.)

If not provided, the action deploys the source artifact to \$LATEST and creates a new version. In this use case, the deploy strategy and target version options are not available.

PublishedTargetVersion

Required: No

The desired Lambda Function version to be deployed to FunctionAlias. It can be pipeline or action level variables, such as #{variables.lambdaTargetVersion}. The version must be published when action execution starts.

Required if no input artifact is provided.

DeployStrategy

```
Required: No (Default is AllAtOnce)
```

Determines the rate that the Lambda deploy action adopts to shift traffic from the original version of the Lambda function to the new version for **FunctionAlias**. Available deploy strategies are canary or linear. Accepted formats:

• AllAtOnce -

Shifts all traffic to the updated Lambda functions at once.

If not specified, the default is AllAtOnce)

• Canary10Percent5Minutes - Shifts 10 percent of traffic in the first increment. The remaining 90 percent is deployed five minutes later.

The values for both percentage and minutes can be changed.

• Linear10PercentEvery1Minute - Shifts 10 percent of traffic every minute until all traffic is shifted.

The values for both percentage and minutes can be changed.

The following considerations apply for this field:

- Maximum total wait time is 2 days.
- Only available when **FunctionAlias** is provided.

Alarms

Required: No

A comma-separated list of alarm names configured for the Lambda deployment. A maximum of 10 alarms can be added. The action fails when monitored alarms go to the ALARM state.

The following image shows an example of the Edit page for the action.

×

Edit action

Action name

Choose a name for your action

Deploy

No more than 100 characters

Action provider

AWS Lambda	•

Region

United States (N. Virginia)

Input artifacts

Choose an input artifact for this action. Learn more 🖸		
▼		
SourceArtifact X		

SourceArtifact Defined by: Source

No more than 100 characters

Function name

Choose a function that you have already created in the AWS Lambda console. Or create a function in the AWS Lambda console and then return to this task.

•

×

Q MyLambdaFunction			
	Q MyLambdaFunction	Q MyLambdaFunction	Q MyLambdaFunction

Function alias

Choose an alias of the Lambda Function to be deployed to, such as live. The alias must exist and have a version behind it when the action executions starts (it will be the rollback target version). If not provided, action deploys source artifact to \$LATEST and creates a new version. In this use case, deploy strategy and target version options are not available.

Deploy strategy

Choose the rate at which the Lambda deploy action adopts to shift traffic from the original version of the Lambda function to the new version.

Canary deployment	•
Traffic Percentage	
Percentage of traffic to shift in each increment (1-100)	
10	
Time interval (minutes)	
Time between traffic shifts	

Alarms

A list of alarm names configured for the lambda deployment. A maximum of 10 alarms can be added. The Lambda deploy action fails when any monitored alarm goes into alarm state.

configuration	API Version 2015-07-09 1061

Input artifacts

- Number of artifacts: 1
- **Description:** The files provided, if any, to support the script actions during the deployment.

Output artifacts

- Number of artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information, see Variables reference.

FunctionVersion

Input artifacts

The new Lambda function version that was deployed.

Service role policy permissions for the Lambda deploy action

When CodePipeline runs the action, CodePipeline service role requires the following permissions, appropriately scoped down for access with least privilege.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "StatementForLambda",
            "Effect": "Allow",
            "Action": [
            "lambda:GetAlias",
            "lambda:GetFunctionConfiguration",
            "lambda:GetProvisionedConcurrencyConfig",
            "lambda:PublishVersion",
```

```
"lambda:UpdateAlias",
                "lambda:UpdateFunctionCode"
            ],
            "Resource": [
                "arn:aws:lambda:aws:{{customerAccountId}}:function:{{FunctionName}}",
                "arn:aws:lambda:aws:{{customerAccountId}}:function:{{FunctionName}}:*"
            ]
        },
        {
            "Sid": "StatementForCloudWatch",
            "Effect": "Allow",
            "Action": [
                "cloudwatch:DescribeAlarms"
            ],
            "Resource": [
                "arn:aws:cloudwatch:aws:{{customerAccountId}}:alarm:{{AlarmNames}}"
            ]
        },
        {
            "Sid": "StatementForLogs1",
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogGroup"
            ],
            "Resource": [
                "arn:aws:logs:aws:{{customerAccountId}}:log-group:/aws/codepipeline/
{{pipelineName}}",
                "arn:aws:logs:aws:{{customerAccountId}}:log-group:/aws/codepipeline/
{{pipelineName}}:*"
            ]
        },
        {
            "Sid": "StatementForLogs2",
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogStream",
                "logs:PutLogEvents"
            ],
            "Resource": [
                "arn:aws:logs:aws:{{customerAccountId}}:log-group:/aws/codepipeline/
{{pipelineName}}:log-stream:*"
            ]
        }
    ]
```

}

Action declaration

YAML

```
name: Deploy
actionTypeId:
 category: Deploy
 owner: AWS
  provider: Lambda
 version: '1'
runOrder: 1
configuration:
  DeployStrategy: Canary10Percent5Minutes
 FunctionAlias: aliasV1
  FunctionName: MyLambdaFunction
outputArtifacts: []
inputArtifacts:
- name: SourceArtifact
region: us-east-1
namespace: DeployVariables
```

JSON

```
{
    "name": "Deploy",
    "actionTypeId": {
        "category": "Deploy",
        "owner": "AWS",
        "provider": "Lambda",
        "version": "1"
    },
    "runOrder": 1,
    "configuration": {
        "DeployStrategy": "Canary10Percent5Minutes",
        "FunctionAlias": "aliasV1",
        "FunctionName": "MyLambdaFunction"
    },
    "outputArtifacts": [],
    "inputArtifacts": [
        {
            "name": "SourceArtifact"
```

```
}
],
"region": "us-east-1",
"namespace": "DeployVariables"
},
```

See also

The following related resources can help you as you work with this action.

 <u>Tutorial: Lambda function deployments with CodePipeline</u> – This tutorial walks you through the creation of a sample Lambda function where you will create an alias and version, add the zipped Lambda function to your source location, and run the Lambda action in your pipeline.

Amazon S3 deploy action reference

You use an Amazon S3 deploy action to deploy files to an Amazon S3 bucket for static web site hosting or archive. You can specify whether to extract deployment files before upload to your bucket.

i Note

This reference topic describes the Amazon S3 deployment action for CodePipeline where the deployment platform is an Amazon S3 bucket configured for hosting. For reference information about the Amazon S3 source action in CodePipeline, see <u>Amazon S3 source action reference</u>.

Topics

- Action type
- Configuration parameters
- Input artifacts
- Output artifacts
- Service role permissions: S3 deploy action
- Example action configuration
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: S3
- Version: 1

Configuration parameters

BucketName

Required: Yes

The name of the Amazon S3 bucket where files are to be deployed.

Extract

Required: Yes

If true, specifies that files are to be extracted before upload. Otherwise, application files remain zipped for upload, such as in the case of a hosted static web site. If false, then the ObjectKey is required.

ObjectKey

Conditional. Required if Extract = false

The name of the Amazon S3 object key that uniquely identifies the object in the S3 bucket.

KMSEncryptionKeyARN

Required: No

The ARN of the Amazon KMS encryption key for the host bucket. The KMSEncryptionKeyARN parameter encrypts uploaded artifacts with the provided Amazon KMS key. For a KMS key, you can use the key ID, the key ARN, or the alias ARN.

1 Note

Aliases are recognized only in the account that created the KMS key. For cross-account actions, you can only use the key ID or key ARN to identify the key. Cross-account

actions involve using the role from the other account (AccountB), so specifying the key ID will use the key from the other account (AccountB).

🔥 Important

CodePipeline only supports symmetric KMS keys. Do not use an asymmetric KMS key to encrypt the data in your S3 bucket.

CannedACL

Required: No

The CannedACL parameter applies the specified <u>canned ACL</u> to objects deployed to Amazon S3. This overwrites any existing ACL that was applied to the object.

CacheControl

Required: No

The CacheControl parameter controls caching behavior for requests/responses for objects in the bucket. For a list of valid values, see the <u>Cache-Control</u> header field for HTTP operations. To enter multiple values in CacheControl, use a comma between each value. You can add a space after each comma (optional), as shown in this example for the CLI:

"CacheControl": "public, max-age=0, no-transform"

Input artifacts

- Number of Artifacts: 1
- **Description:** The files for deployment or archive are obtained from the source repository, zipped, and uploaded by CodePipeline.

Output artifacts

- Number of artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: S3 deploy action

For S3 deploy action support, add the following to your policy statement:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "s3:PutObject",
        "s3:PutObjectAcl",
        "s3:PutObjectVersionAcl",
        "s3:GetBucketVersioning",
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": [
        "arn:aws:s3:::[[s3DeployBuckets]]",
        "arn:aws:s3:::[[s3DeployBuckets]]/*"
      ],
      "Condition": {
        "StringEquals": {
          "aws:ResourceAccount": "{{customerAccountId}}"
        }
      }
    }
  ]
}
```

For the S3 deploy action support, if your S3 objects have tags, you must also add the following permissions to your policy statement:

```
"s3:GetObjectTagging",
"s3:GetObjectVersionTagging",
"s3:PutObjectTagging"
```

Example action configuration

The following show examples for the action configuration.

Example configuration when Extract is set to false

The following example shows the default action configuration when the action is created with the Extract field set to false.

YAML

```
Name: Deploy
Actions:
  - Name: Deploy
    ActionTypeId:
      Category: Deploy
      Owner: AWS
      Provider: S3
      Version: '1'
    RunOrder: 1
    Configuration:
      BucketName: website-bucket
      Extract: 'false'
      ObjectKey: MyWebsite
    OutputArtifacts: []
    InputArtifacts:
      - Name: SourceArtifact
    Region: us-west-2
    Namespace: DeployVariables
```

JSON

```
{
    "Name": "Deploy",
    "Actions": [
        {
            "Name": "Deploy",
            "ActionTypeId": {
                "Category": "Deploy",
                "Owner": "AWS",
                "Provider": "S3",
                "Version": "1"
        },
        "RunOrder": 1,
        "Configuration": {
                "BucketName": "website-bucket",
                "Extract": "false",
                "Extract": "false",
                "
                "States and the set and the set
```

Example configuration when Extract is set to true

The following example shows the default action configuration when the action is created with the Extract field set to true.

YAML

```
Name: Deploy
Actions:
  - Name: Deploy
    ActionTypeId:
      Category: Deploy
      Owner: AWS
      Provider: S3
      Version: '1'
    RunOrder: 1
    Configuration:
      BucketName: website-bucket
      Extract: 'true'
    OutputArtifacts: []
    InputArtifacts:
      - Name: SourceArtifact
    Region: us-west-2
    Namespace: DeployVariables
```

JSON

{

```
"Name": "Deploy",
    "Actions": [
        {
            "Name": "Deploy",
            "ActionTypeId": {
                 "Category": "Deploy",
                "Owner": "AWS",
                 "Provider": "S3",
                 "Version": "1"
            },
            "RunOrder": 1,
            "Configuration": {
                 "BucketName": "website-bucket",
                "Extract": "true"
                },
            "OutputArtifacts": [],
            "InputArtifacts": [
                {
                     "Name": "SourceArtifact"
                }
            ],
            "Region": "us-west-2",
            "Namespace": "DeployVariables"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

- <u>Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider</u> This tutorial walks you through two examples for creating a pipeline with an S3 deploy action. You download sample files, upload the files to your CodeCommit repository, create your S3 bucket, and configure your bucket for hosting. Next, you use the CodePipeline console to create your pipeline and specify an Amazon S3 deployment configuration.
- <u>Amazon S3 source action reference</u> This action reference provides reference information and examples for Amazon S3 source actions in CodePipeline.

Amazon S3 source action reference

Triggers the pipeline when a new object is uploaded to the configured bucket and object key.

Note

This reference topic describes the Amazon S3 source action for CodePipeline where the source location is an Amazon S3 bucket configured for versioning. For reference information about the Amazon S3 deploy action in CodePipeline, see <u>Amazon S3 deploy</u> action reference.

You can create an Amazon S3 bucket to use as the source location for your application files.

Note

When you create your source bucket, make sure you enable versioning on the bucket. If you want to use an existing Amazon S3 bucket, see <u>Using versioning</u> to enable versioning on an existing bucket.

If you use the console to create or edit your pipeline, CodePipeline creates an EventBridge rule that starts your pipeline when a change occurs in the S3 source bucket.

🚯 Note

For Amazon ECR, Amazon S3, or CodeCommit sources, you can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and EventBridge</u> resources, <u>Connecting to Amazon S3 source actions with a source enabled for events</u>, or <u>CodeCommit source actions and EventBridge</u>.

You must have already created an Amazon S3 source bucket and uploaded the source files as a single ZIP file before you connect the pipeline through an Amazon S3 action.

i Note

When Amazon S3 is the source provider for your pipeline, you may zip your source file or files into a single .zip and upload the .zip to your source bucket. You may also upload a single unzipped file; however, downstream actions that expect a .zip file will fail.

Topics

- <u>Action type</u>
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: S3 source action
- Action declaration
- See also

Action type

- Category: Source
- Owner: AWS
- Provider: S3
- Version: 1

Configuration parameters

S3Bucket

Required: Yes

The name of the Amazon S3 bucket where source changes are to be detected.

S3ObjectKey

Required: Yes

The name of the Amazon S3 object key where source changes are to be detected. AllowOverrideForS3ObjectKey

Required: No

AllowOverrideForS30bjectKey controls whether source overrides from StartPipelineExecution can override the already configured S30bjectKey in the source action. For more information on source overrides with the S3 Object Key, see <u>Start a pipeline</u> with a source revision override.

🔥 Important

If you omit AllowOverrideForS3ObjectKey, CodePipeline defaults the ability to override the S3 ObjectKey in the source action by setting this parameter to false.

Valid values for this parameter:

 true: If set, the pre-configured S3 Object Key can be overridden by source revision overrides during a pipeline execution.

🚯 Note

If you intend to allow all CodePipeline users the ability to override the preconfigured S3 Object Key while starting a new pipeline execution, you must set AllowOverrideForS3ObjectKey to true.

false:

If set, CodePipeline will not allow the S3 Object Key to be overridden using source revision overrides. This is also the default value for this parameter.

PollForSourceChanges

Required: No

PollForSourceChanges controls whether CodePipeline polls the Amazon S3 source bucket for source changes. We recommend that you use CloudWatch Events and CloudTrail to detect source changes instead. For more information about configuring CloudWatch Events, see <u>Migrate polling pipelines with an S3 source and CloudTrail trail (CLI)</u> or <u>Migrate polling pipelines</u> with an S3 source and CloudTrail trail (Amazon CloudFormation template).

A Important

If you intend to configure CloudWatch Events, you must set PollForSourceChanges to false to avoid duplicate pipeline executions.

Valid values for this parameter:

• true: If set, CodePipeline polls your source location for source changes.

🚯 Note

If you omit PollForSourceChanges, CodePipeline defaults to polling your source location for source changes. This behavior is the same as if PollForSourceChanges is included and set to true.

• false: If set, CodePipeline does not poll your source location for source changes. Use this setting if you intend to configure a CloudWatch Events rule to detect source changes.

Input artifacts

- Number of Artifacts: 0
- **Description:** Input artifacts do not apply for this action type.

Output artifacts

- Number of artifacts: 1
- Description: Provides the artifacts that are available in the source bucket configured to connect to the pipeline. The artifacts generated from the bucket are the output artifacts for the Amazon S3 action. The Amazon S3 object metadata (ETag and version ID) is displayed in CodePipeline as the source revision for the triggered pipeline execution.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as

output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information about variables in CodePipeline, see Variables reference.

BucketName

The name of the Amazon S3 bucket related to the source change that triggered the pipeline.

ETag

The entity tag for the object related to the source change that triggered the pipeline. The ETag is an MD5 hash of the object. ETag reflects only changes to the contents of an object, not its metadata.

ObjectKey

The name of the Amazon S3 object key related to the source change that triggered the pipeline.

VersionId

The version ID for the version of the object related to the source change that triggered the pipeline.

Service role permissions: S3 source action

For S3 source action support, add the following to your policy statement:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
         "Effect": "Allow",
         "Action": [
            "s3:GetObject",
            "s3:GetObjectVersion",
            "s3:GetBucketVersioning",
            "s3:GetBucketAcl",
            "s3:GetBucketLocation",
            "s3:GetObjectTagging",
            "s3:GetObjectVersionTagging"
        ],
        "Resource": [
```

```
"arn:aws:s3:::[[S3Bucket]]",
    "arn:aws:s3:::[[S3Bucket]]/*"
],
    "Condition": {
        "StringEquals": {
            "aws:ResourceAccount": "{{customerAccountId}}"
        }
     }
     }
}
```

Action declaration

YAML

```
Name: Source
Actions:
  - RunOrder: 1
   OutputArtifacts:
      - Name: SourceArtifact
   ActionTypeId:
      Provider: S3
      Owner: AWS
      Version: '1'
      Category: Source
    Region: us-west-2
    Name: Source
    Configuration:
      S3Bucket: amzn-s3-demo-source-bucket
      S3ObjectKey: my-application.zip
      PollForSourceChanges: 'false'
    InputArtifacts: []
```

JSON

```
{
    "Name": "Source",
    "Actions": [
        {
            "RunOrder": 1,
            "OutputArtifacts": [
```

```
{
                     "Name": "SourceArtifact"
                }
            ],
            "ActionTypeId": {
                 "Provider": "S3",
                "Owner": "AWS",
                 "Version": "1",
                 "Category": "Source"
            },
            "Region": "us-west-2",
            "Name": "Source",
            "Configuration": {
                 "S3Bucket": "amzn-s3-demo-source-bucket",
                 "S3ObjectKey": "my-application.zip",
                 "PollForSourceChanges": "false"
            },
            "InputArtifacts": []
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

 <u>Tutorial: Create a simple pipeline (S3 bucket)</u> – This tutorial provides a sample app spec file and sample CodeDeploy application and deployment group. Use this tutorial to create a pipeline with an Amazon S3 source that deploys to Amazon EC2 instances.

Amazon AppConfig deploy action reference

Amazon AppConfig is a capability of Amazon Systems Manager. AppConfig supports controlled deployments to applications of any size and includes built-in validation checks and monitoring. You can use AppConfig with applications hosted on Amazon EC2 instances, Amazon Lambda, containers, mobile applications, or IoT devices.

The AppConfig deploy action is an Amazon CodePipeline action that deploys configurations stored in your pipeline source location to a specified AppConfig *application*, *environment*, and *configuration* profile. It uses the preferences defined in an AppConfig *deployment strategy*.

Action type

- Category: Deploy
- Owner: AWS
- Provider: AppConfig
- Version: 1

Configuration parameters

Application

Required: Yes

The ID of the Amazon AppConfig application with the details for your configuration and deployment.

Environment

Required: Yes

The ID of the Amazon AppConfig environment where the configuration is deployed.

ConfigurationProfile

Required: Yes

The ID of the Amazon AppConfig configuration profile to deploy.

InputArtifactConfigurationPath

Required: Yes

The file path of the configuration data within the input artifact to deploy.

DeploymentStrategy

Required: No

The Amazon AppConfig deployment strategy to use for deployment.

Input artifacts

• Number of artifacts: 1

Action type

Output artifacts

Not applicable.

Service role permissions: AppConfig action

When CodePipeline runs the action, the CodePipeline service role policy requires the following permissions, appropriately scoped down to the resource level in order to maintain access with least privilege.

```
{
    "Version": "2012-10-17",
    "Statement": [
         {
            "Action": [
                "appconfig:StartDeployment",
                "appconfig:StopDeployment",
                "appconfig:GetDeployment"
            ],
            "Resource": [
             "arn:aws:appconfig:*:{{customerAccountId}}:application/[[Application]]",
             "arn:aws:appconfig:*:{{customerAccountId}}:application/[[Application]]/*",
             "arn:aws:appconfig:*:{{customerAccountId}}:deploymentstrategy/*"
         ],
            "Effect": "Allow"
        }
    ]
}
```

Example action configuration

YAML

```
name: Deploy
actions:
    - name: Deploy
    actionTypeId:
        category: Deploy
        owner: AWS
```

```
provider: AppConfig
version: '1'
runOrder: 1
configuration:
  Application: 2s2qv57
  ConfigurationProfile: PvjrpU
  DeploymentStrategy: frqt7ir
  Environment: 9tm27yd
  InputArtifactConfigurationPath: /
outputArtifacts: []
inputArtifacts:
        - name: SourceArtifact
region: us-west-2
namespace: DeployVariables
```

```
JSON
```

```
{
    "name": "Deploy",
    "actions": [
        {
            "name": "Deploy",
            "actionTypeId": {
                "category": "Deploy",
                "owner": "AWS",
                "provider": "AppConfig",
                "version": "1"
            },
            "runOrder": 1,
            "configuration": {
                "Application": "2s2qv57",
                "ConfigurationProfile": "PvjrpU",
                "DeploymentStrategy": "frqt7ir",
                "Environment": "9tm27yd",
                "InputArtifactConfigurationPath": "/"
            },
            "outputArtifacts": [],
            "inputArtifacts": [
                {
                    "name": "SourceArtifact"
                }
            ],
            "region": "us-west-2",
```

```
"namespace": "DeployVariables"
}
]
```

See also

}

The following related resources can help you as you work with this action.

- <u>Amazon AppConfig</u> For information about Amazon AppConfig deployments, see the *Amazon Systems Manager User Guide*.
- <u>Tutorial: Create a pipeline that uses Amazon AppConfig as a deployment provider</u> This tutorial gets you started setting up simple deployment configuration files and AppConfig resources, and shows you how to use the console to create a pipeline with an Amazon AppConfig deployment action.

Amazon CloudFormation deploy action reference

Executes an operation on an Amazon CloudFormation stack. A stack is a collection of Amazon resources that you can manage as a single unit. The resources in a stack are defined by the stack's Amazon CloudFormation template. A change set creates a comparison that can be viewed without altering the original stack. For information about the types of Amazon CloudFormation actions that can be performed on stacks and change sets, see the ActionMode parameter.

Note: The CodePipeline action for Amazon CloudFormation is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service</u> integrations with CodePipeline.

To construct an error message for an Amazon CloudFormation action where a stack operation has failed, CodePipeline calls the Amazon CloudFormation DescribeStackEvents API. If an action IAM role has permission to access that API, the details about the first failed resource will be included in the CodePipeline error message. Otherwise, if the role policy does not have the appropriate permission, CodePipeline will ignore accessing the API and show a generic error message instead. To do this, the cloudformation:DescribeStackEvents permission must be added to the service role or other IAM roles for the pipeline.

If you do not want the resource details surfaced in the pipeline error messages, you can revoke this permission for the action IAM role by removing the cloudformation:DescribeStackEvents permission.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: Amazon CloudFormation action
- Action declaration
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: CloudFormation
- Version: 1

Configuration parameters

ActionMode

Required: Yes

ActionMode is the name of the action Amazon CloudFormation performs on a stack or change set. The following action modes are available:

- CHANGE_SET_EXECUTE executes a change set for the resource stack that is based on a set of specified resource updates. With this action, Amazon CloudFormation starts to alter the stack.
- CHANGE_SET_REPLACE creates the change set, if it doesn't exist, based on the stack name and template that you submit. If the change set exists, Amazon CloudFormation deletes it, and then creates a new one.

- CREATE_UPDATE creates the stack if it doesn't exist. If the stack exists, Amazon CloudFormation updates the stack. Use this action to update existing stacks. Unlike REPLACE_ON_FAILURE, if the stack exists and is in a failed state, CodePipeline won't delete and replace the stack.
- DELETE_ONLY deletes a stack. If you specify a stack that doesn't exist, the action is completed successfully without deleting a stack.
- REPLACE_ON_FAILURE creates a stack, if it doesn't exist. If the stack exists and is in a failed state, Amazon CloudFormation deletes the stack, and then creates a new stack. If the stack isn't in a failed state, Amazon CloudFormation updates it.

The stack is in a failed state when any of the following status types are displayed in Amazon CloudFormation:

- ROLLBACK_FAILED
- CREATE_FAILED
- DELETE_FAILED
- UPDATE_ROLLBACK_FAILED

Use this action to automatically replace failed stacks without recovering or troubleshooting them.

🔥 Important

We recommend that you use REPLACE_ON_FAILURE for testing purposes only because it might delete your stack.

StackName

Required: Yes

StackName is the name of an existing stack or a stack that you want to create.

Capabilities

Required: Conditional

Use of Capabilities acknowledges that the template might have the capabilities to create and update some resources on its own, and that these capabilities are determined based on the types of resources in the template. This property is required if you have IAM resources in your stack template or you create a stack directly from a template containing macros. In order for the Amazon CloudFormation action to successfully operate in this way, you must explicitly acknowledge that you would like it to do so with one of the following capabilities:

- CAPABILITY_IAM
- CAPABILITY_NAMED_IAM
- CAPABILITY_AUTO_EXPAND

You can specify more than one capability by using a comma (no space) between capabilities. The example in <u>Action declaration</u> shows an entry with both the CAPABILITY_IAM and CAPABILITY_AUTO_EXPAND properties.

For more information about Capabilities, see the properties under <u>UpdateStack</u> in the *Amazon CloudFormation API Reference*.

ChangeSetName

Required: Conditional

ChangeSetName is the name of an existing change set or a new change set that you want to create for the specified stack.

This property is required for the following action modes: CHANGE_SET_REPLACE and CHANGE_SET_EXECUTE. For all other action modes, this property is ignored.

RoleArn

Required: Conditional

The RoleArn is the ARN of the IAM service role that Amazon CloudFormation assumes when it operates on resources in the specified stack. RoleArn is not applied when executing a change set. If you do not use CodePipeline to create the change set, make sure that the change set or stack has an associated role.

🚯 Note

This role must be in the same account as the role for the action that is running, as configured in the action declaration RoleArn.

This property is required for the following action modes:

- CREATE_UPDATE
- REPLACE_ON_FAILURE
- DELETE_ONLY
- CHANGE_SET_REPLACE

🚯 Note

Amazon CloudFormation is given an S3-signed URL to the template; therefore, this RoleArn does not need permission to access the artifact bucket. However, the action RoleArn *does* need permission to access the artifact bucket, in order to generate the signed URL.

TemplatePath

Required: Conditional

TemplatePath represents the Amazon CloudFormation template file. You include the file in an input artifact to this action. The file name follows this format:

Artifactname::TemplateFileName

Artifactname is the input artifact name as it appears in CodePipeline. For example, a source stage with the artifact name of SourceArtifact and a template-export.json file name creates a TemplatePath name, as shown in this example:

"TemplatePath": "SourceArtifact::template-export.json"

This property is required for the following action modes:

- CREATE_UPDATE
- REPLACE_ON_FAILURE
- CHANGE_SET_REPLACE

For all other action modes, this property is ignored.

Note

The Amazon CloudFormation template file containing the template body has a minimum length of 1 byte and a maximum length of 1 MB. For Amazon CloudFormation

deployment actions in CodePipeline, the maximum input artifact size is always 256 MB. For more information, see <u>Quotas in Amazon CodePipeline</u> and <u>Amazon</u> <u>CloudFormation Limits</u>.

OutputFileName

Required: No

Use OutputFileName to specify an output file name, such as CreateStackOutput.json, that CodePipeline adds to the pipeline output artifact for this action. The JSON file contains the contents of the Outputs section from the Amazon CloudFormation stack.

If you don't specify a name, CodePipeline doesn't generate an output file or artifact.

ParameterOverrides

Required: No

Parameters are defined in your stack template and allow you to provide values for them at the time of stack creation or update. You can use a JSON object to set parameter values in your template. (These values override those set in the template configuration file.) For more information about using parameter overrides, see <u>Configuration Properties (JSON Object</u>).

We recommend that you use the template configuration file for most of your parameter values. Use parameter overrides only for values that aren't known until the pipeline is running. For more information, see <u>Using Parameter Override Functions with CodePipeline Pipelines</u> in the *Amazon CloudFormation User Guide*.

Note

All parameter names must be present in the stack template.

TemplateConfiguration

Required: No

TemplateConfiguration is the template configuration file. You include the file in an input artifact to this action. It can contain template parameter values and a stack policy. For more

information about the template configuration file format, see <u>Amazon CloudFormation</u> <u>Artifacts</u>.

The template configuration file name follows this format:

Artifactname::TemplateConfigurationFileName

Artifactname is the input artifact name as it appears in CodePipeline. For example, a source stage with the artifact name of SourceArtifact and a test-configuration.json file name creates a TemplateConfiguration name as shown in this example:

```
"TemplateConfiguration": "SourceArtifact::test-configuration.json"
```

Input artifacts

- Number of artifacts: 0 to 10
- **Description:** As input, the Amazon CloudFormation action optionally accepts artifacts for these purposes:
 - To provide the stack template file to execute. (See the TemplatePath parameter.)
 - To provide the template configuration file to use. (See the TemplateConfiguration parameter.) For more information about the template configuration file format, see <u>Amazon</u> CloudFormation Artifacts.
 - To provide the artifact for a Lambda function to be deployed as part of the Amazon CloudFormation stack.

Output artifacts

- Number of artifacts: 0 to 1
- **Description:** If the OutputFileName parameter is specified, there is an output artifact produced by this action that contains a JSON file with the specified name. The JSON file contains the contents of the Outputs section from the Amazon CloudFormation stack.

For more information about the outputs section you can create for your Amazon CloudFormation action, see <u>Outputs</u>.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For Amazon CloudFormation actions, variables are produced from any values designated in the Outputs section of a stack template. Note that the only CloudFormation action modes that generate outputs are those that result in creating or updating a stack, such as stack creation, stack updates, and change set execution. The corresponding action modes that generate variables are:

- CHANGE_SET_EXECUTE
- CHANGE_SET_REPLACE
- CREATE_UPDATE
- REPLACE_ON_FAILURE

For more information, see <u>Variables reference</u>. For a tutorial that shows you how to create a pipeline with a CloudFormation deployment action in a pipeline that uses CloudFormation output variables, see <u>Tutorial: Create a pipeline that uses variables from Amazon CloudFormation</u> <u>deployment actions</u>.

Service role permissions: Amazon CloudFormation action

When CodePipeline runs the action, the CodePipeline service role policy requires the following permissions, appropriately scoped down to the pipeline resource ARN in order to maintain access with least privilege. For example, add the following to your policy statement:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "AllowCFNStackAccess",
            "Effect": "Allow",
            "Action": [
               "cloudformation:CreateStack",
               "cloudformation:UpdateStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStack",
               "cloudformation:DeleteStacks",
               "cloudformation:DeleteStacks",
```

```
"cloudformation:DescribeStackResources",
        "cloudformation:DescribeStackEvents",
        "cloudformation:GetTemplate",
        "cloudformation:DescribeChangeSet",
        "cloudformation:CreateChangeSet",
        "cloudformation:DeleteChangeSet",
        "cloudformation:ExecuteChangeSet"
      ],
      "Resource": [
        "arn:aws:cloudformation:*:{{customerAccountId}}:stack/[[cfnDeployStackNames]]/
* "
       ]
    },
    {
      "Sid": "ValidateTemplate",
      "Effect": "Allow",
      "Action": [
        "cloudformation:ValidateTemplate"
      ],
      "Resource": "*"
    },
    {
      "Sid": "AllowIAMPassRole",
      "Effect": "Allow",
      "Action": [
        "iam:PassRole"
      ],
      "Resource": [
        "arn:aws:iam::{{customerAccountId}}:role/[[cfnExecutionRoles]]"
      ],
      "Condition": {
        "StringEqualsIfExists": {
          "iam:PassedToService": [
            "cloudformation.amazonaws.com"
          ]
        }
      }
    }
  ]
}
```

Note that the cloudformation:DescribeStackEvents permission is optional. It allows the Amazon CloudFormation action to show a more detailed error message. This permission can

be revoked from the IAM role if you don't want resource details surfaced in the pipeline error messages.

Action declaration

YAML

```
Name: ExecuteChangeSet
ActionTypeId:
 Category: Deploy
 Owner: AWS
  Provider: CloudFormation
  Version: '1'
RunOrder: 2
Configuration:
  ActionMode: CHANGE_SET_EXECUTE
  Capabilities: CAPABILITY_NAMED_IAM, CAPABILITY_AUTO_EXPAND
  ChangeSetName: pipeline-changeset
  ParameterOverrides: '{"ProjectId": "my-project", "CodeDeployRole":
 "CodeDeploy_Role_ARN"}'
  RoleArn: CloudFormation_Role_ARN
 StackName: my-project--lambda
 TemplateConfiguration: 'my-project--BuildArtifact::template-configuration.json'
  TemplatePath: 'my-project--BuildArtifact::template-export.yml'
OutputArtifacts: []
InputArtifacts:
  - Name: my-project-BuildArtifact
```

JSON

```
{
    "Name": "ExecuteChangeSet",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "CloudFormation",
        "Version": "1"
    },
    "RunOrder": 2,
    "Configuration": {
        "ActionMode": "CHANGE_SET_EXECUTE",
        "Capabilities": "CAPABILITY_NAMED_IAM,CAPABILITY_AUTO_EXPAND",
        "ChangeSetName": "pipeline-changeset",
    }
}
```

```
"ParameterOverrides": "{\"ProjectId\": \"my-project\",\"CodeDeployRole\":
    \"CodeDeploy_Role_ARN\"}",
        "RoleArn": "CloudFormation_Role_ARN",
        "StackName": "my-project--lambda",
        "TemplateConfiguration": "my-project--BuildArtifact::template-
configuration.json",
        "TemplatePath": "my-project--BuildArtifact::template-export.yml"
    },
        "OutputArtifacts": [],
        "InputArtifacts": [],
        "InputArtifacts": [],
        "Name": "my-project-BuildArtifact"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

- <u>Configuration Properties Reference</u> This reference chapter in the *Amazon CloudFormation User Guide* provides more descriptions and examples for these CodePipeline parameters.
- <u>Amazon CloudFormation API Reference</u> The <u>CreateStack</u> parameter in the *Amazon CloudFormation API Reference* describes stack parameters for Amazon CloudFormation templates.

Amazon CloudFormation StackSets deploy action reference

CodePipeline offers the ability to perform Amazon CloudFormation StackSets operations as part of your CI/CD process. You use a stack set to create stacks in Amazon accounts across Amazon Regions by using a single Amazon CloudFormation template. All the resources included in each stack are defined by the stack set's Amazon CloudFormation template. When you create the stack set, you specify the template to use, as well as any parameters and capabilities that the template requires.

For more information about concepts for Amazon CloudFormation StackSets, see <u>StackSets</u> <u>concepts</u> in the *Amazon CloudFormation User Guide*.

You integrate your pipeline with Amazon CloudFormation StackSets through two distinct action types that you use together:

- The CloudFormationStackSet action creates or updates a stack set or stack instances from the template stored in the pipeline source location. Each time a stack set is created or updated, it initiates a deployment of those changes to specified instances. In the console, you can choose the **CloudFormation Stack Set** action provider when you create or edit your pipeline.
- The CloudFormationStackInstances action deploys changes from the CloudFormationStackSet action to specified instances, creates new stack instances, and defines parameter overrides to specified instances. In the console, you can choose the **CloudFormation Stack Instances** action provider when you edit an existing pipeline.

These actions are not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see Product and service integrations with CodePipeline.

You can use these actions to deploy to target Amazon accounts or target Amazon Organizations organizational unit IDs.

🚯 Note

To deploy to target Amazon Organizations accounts or organizational unit IDs and use the service-managed permissions model, you must enable trusted access between Amazon CloudFormation StackSets and Amazon Organizations. For more information, see <u>Enabling</u> trusted access with Amazon CloudFormation Stacksets.

Topics

- How Amazon CloudFormation StackSets actions work
- How to structure StackSets actions in a pipeline
- The CloudFormationStackSet action
- The CloudFormationStackInstances action
- Service role permissions: CloudFormationStackSet action
- Service role permissions: CloudFormationStackInstances action
- Permissions models for stack set operations
- <u>Template parameter data types</u>

See also

How Amazon CloudFormation StackSets actions work

A CloudFormationStackSet action creates or updates resources depending on whether the action is running for the first time.

The CloudFormationStackSet action *creates* or *updates* the stack set and deploys those changes to specified instances.

🚯 Note

If you use this action to make an update that includes adding stack instances, the new instances are deployed first and the update is completed last. The new instances first receive the old version, and then the update is applied to all instances.

- Create: When no instances are specified and the stack set does not exist, the CloudFormationStackSet action creates the stack set without creating any instances.
- *Update*: When the **CloudFormationStackSet** action is run for a stack set that is already created, the action updates the stack set. If no instances are specified and the stack set already exists, all instances are updated. If this action is used to update specific instances, all remaining instances move to an OUTDATED status.

You can use the **CloudFormationStackSet** action to update the stack set in the following ways.

- Update the template on some or all instances.
- Update parameters on some or all instances.
- Update the execution role for the stack set (this must match the execution role specified in the Administrator role).
- Change the permissions model (only if no instances have been created).
- Enable/Disable AutoDeployment if the stack set permissions model is Service Managed.
- Act as a delegated administrator in a member account if the stack set permissions model is Service Managed.
- Update the Administrator role.
- Update the description on the stack set.
- Add deployment targets to the stack set update to create new stack instances.

User Guide

The CloudFormationStackInstances action creates new stack instances or updates outdated stack instances. An instance becomes outdated when a stack set is updated, but not all instances within it are updated.

- *Create*: If the stack already exists, the CloudFormationStackInstances action only updates instances and does not create stack instances.
- Update: After the CloudFormationStackSet action is performed, if the template or parameters have been updated in only some instances, the rest will be marked OUTDATED. In later pipeline stages, CloudFormationStackInstances updates the rest of the instances in the stack set in waves so that all instances are marked CURRENT. This action can also be used to add additional instances or override parameters on new or existing instances.

As part of an update, the CloudFormationStackSet and CloudFormationStackInstances actions can specify new deployment targets, which creates new stack instances.

As part of an update, the CloudFormationStackSet and CloudFormationStackInstances actions do not delete stack sets, instances, or resources. When the action updates a stack but does not specify all instances to be updated, the instances that were not specified for update are removed from the update and set to a status of OUTDATED.

During a deployment, stack instances can also show a status of OUTDATED if the deployment to instances failed.

How to structure StackSets actions in a pipeline

As a best practice, you should construct your pipeline so that the stack set is created and initially deploys to a subset or a single instance. After you test your deployment and view the generated stack set, then add the CloudFormationStackInstances action so that the remaining instances are created and updated.

Use the console or the CLI to create the recommended pipeline structure as follows:

- 1. Create a pipeline with a source action (required) and the CloudFormationStackSet action as the deploy action. Run your pipeline.
- 2. When your pipeline first runs, the CloudFormationStackSet action *creates* your stack set and at least one initial instance. Verify the stack set creation and review the deployment to your initial instance. For example, for initial stack set creation for account Account-A where us east-1 is the specified Region, the stack instance is created with the stack set:

Stack instance	Region	Status
StackInstanceID-1	us-east-1	CURRENT

3. Edit your pipeline to add CloudFormationStackInstances as the second deployment action to create/update stack instances for the targets you designate. For example, for stack instance creation for account Account-A where the us-east-2 and eu-central-1 Regions are specified, the remaining stack instances are created and the initial instance remains updated as follows:

Stack instance	Region	Status
StackInstanceID-1	us-east-1	CURRENT
StackInstanceID-2	us-east-2	CURRENT
StackInstanceID-3	eu-central-1	CURRENT

4. Run your pipeline as needed to update your stack set and update or create stack instances.

When you initiate a stack update where you have removed deployment targets from the action configuration, then the stack instances that were not designated for update are removed from the deployment and move into an OUTDATED status. For example, for stack instance update for account Account-A where the us-east-2 Region is removed from the action configuration, the remaining stack instances are created and the removed instance is set to OUTDATED as follows:

Stack instance	Region	Status
StackInstanceID-1	us-east-1	CURRENT
StackInstanceID-2	us-east-2	OUTDATED
StackInstanceID-3	eu-central-1	CURRENT

For more information about best practices for deploying stack sets, see <u>Best practices</u> for StackSets in the *Amazon CloudFormation User Guide*.

How to structure StackSets actions in a pipeline

The CloudFormationStackSet action

This action creates or updates a stack set from the template stored in the pipeline source location.

After you define a stack set, you can create, update, or delete stacks in the target accounts and Regions specified in the configuration parameters. When creating, updating and deleting stacks, you can specify other preferences, such as the order of Regions for operations to be performed, the failure tolerance percentage beyond which stack operations stop, and the number of accounts in which operations are performed on stacks concurrently.

A stack set is a regional resource. If you create a stack set in one Amazon Region, you cannot access it from other Regions.

When this action is used as an update action to the stack set, updates to the stack are not allowed without a deployment to at least one stack instance.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Example CloudFormationStackSet action configuration

Action type

- Category: Deploy
- Owner: AWS
- Provider: CloudFormationStackSet
- Version: 1

Configuration parameters

StackSetName

Required: Yes

The name to associate with the stack set. This name must be unique in the Region where it is created.

The name may only contain alphanumeric and hyphen characters. It must begin with an alphabetic character and be 128 characters or fewer.

Description

Required: No

A description of the stack set. You can use this to describe the stack set's purpose or other relevant information.

TemplatePath

Required: Yes

The location of the template that defines the resources in the stack set. This must point to a template with a maximum size of 460,800 bytes.

Enter the path to the source artifact name and template file in the format "InputArtifactName::TemplateFileName", as shown in the following example.

SourceArtifact::template.txt

Parameters

Required: No

A list of template parameters for your stack set that update during a deployment.

You can provide parameters as a literal list or a file path:

 You can enter parameters in the following shorthand syntax format: ParameterKey=string, ParameterValue=string, UsePreviousValue=boolean, ResolvedV ParameterKey=string, ParameterValue=string, UsePreviousValue=boolean, ResolvedV For more information about these data types, see Template parameter data types.

The following example shows a parameter named BucketName with the value amzn-s3demo-source-bucket.

ParameterKey=BucketName, ParameterValue=amzn-s3-demo-source-bucket

The following example shows an entry with multiple parameters:

```
ParameterKey=BucketName,ParameterValue=amzn-s3-demo-source-bucket
ParameterKey=Asset1,ParameterValue=true
ParameterKey=Asset2,ParameterValue=true
```

 You can enter the location of the file containing a list of template parameter overrides entered in the format "InputArtifactName::ParametersFileName", as shown in the following example.

```
SourceArtifact::parameters.txt
```

The following example shows the file contents for parameters.txt.

Capabilities

Required: No

Indicates that the template can create and update resources, depending on the types of resources in the template.

You must use this property if you have IAM resources in your stack template or you create a stack directly from a template containing macros. For the Amazon CloudFormation action to successfully operate in this way, you must use one of the following capabilities:

- CAPABILITY_IAM
- CAPABILITY_NAMED_IAM

You can specify more than one capability by using a comma and no spaces between capabilities. The example in <u>Example CloudFormationStackSet action configuration</u> shows an entry with multiple capabilities.

PermissionModel

Required: No

Determines how IAM roles are created and managed. If the field is not specified, the default is used. For information, see Permissions models for stack set operations.

Valid values are:

- SELF_MANAGED (default): You must create administrator and execution roles to deploy to target accounts.
- SERVICE_MANAGED: Amazon CloudFormation StackSets automatically creates the IAM roles required to deploy to accounts managed by Amazon Organizations. This requires an account to be a member of an Organization.

Note

This parameter can only be changed when no stack instances exist in the stack set.

AdministrationRoleArn

Note

Because Amazon CloudFormation StackSets performs operations across multiple accounts, you must define the necessary permissions in those accounts before you can create the stack set.

Required: No

1 Note

This parameter is optional for the SELF_MANAGED permissions model and is not used for the SERVICE_MANAGED permissions model.

The ARN of the IAM role in the administrator account used to perform stack set operations.

The name may contain alphanumeric characters, any of the following characters: _+=,.@-, and no spaces. The name is not case sensitive. This role name must be a minimum length of 20 characters and maximum length of 2048 characters. Role names must be unique within the account. The role name specified here must be an existing role name. If you do not specify the role name, it is set to AWSCloudFormationStackSetAdministrationRole. If you specify ServiceManaged, you must not define a role name.

ExecutionRoleName

Note

Because Amazon CloudFormation StackSets performs operations across multiple accounts, you must define the necessary permissions in those accounts before you can create the stack set.

Required: No

Note

This parameter is optional for the SELF_MANAGED permissions model and is not used for the SERVICE_MANAGED permissions model.

The name of the IAM role in the target accounts used to perform stack set operations. The name may contain alphanumeric characters, any of the following characters: _+=,.@-, and no spaces. The name is not case sensitive. This role name must be a minimum length of 1 character and maximum length of 64 characters. Role names must be unique within the account. The role name specified here must be an existing role name. Do not specify this role if you are using customized execution roles. If you do not specify the role name, it is set to AWSCloudFormationStackSetExecutionRole. If you set Service_Managed to true, you must not define a role name.

OrganizationsAutoDeployment

Required: No

🚯 Note

This parameter is optional for the SERVICE_MANAGED permissions model and is not used for the SELF_MANAGED permissions model.

Describes whether Amazon CloudFormation StackSets automatically deploys to Amazon Organizations accounts that are added to a target organization or organizational unit (OU). If OrganizationsAutoDeployment is specified, do not specify DeploymentTargets and Regions.

🚯 Note

If no input is provided for OrganizationsAutoDeployment, then the default value is Disabled.

Valid values are:

• Enabled. Required: No.

StackSets automatically deploys additional stack instances to Amazon Organizations accounts that are added to a target organization or organizational unit (OU) in the specified Regions. If an account is removed from a target organization or OU, Amazon CloudFormation StackSets deletes stack instances from the account in the specified Regions.

• Disabled. Required: No.

StackSets does not automatically deploy additional stack instances to Amazon Organizations accounts that are added to a target organization or organizational unit (OU) in the specified Regions.

• EnabledWithStackRetention. Required: No.

Stack resources are retained when an account is removed from a target organization or OU.

DeploymentTargets

Required: No

The CloudFormationStackSet action

🚯 Note

For the SERVICE_MANAGED permissions model, you can provide either the organization root ID or organizational Unit IDs for deployment targets. For the SELF_MANAGED permissions model, you can only provide accounts.

1 Note

When this parameter is selected, you must also select **Regions**.

A list of Amazon accounts or organizational unit IDs where stack set instances should be created/updated.

• Accounts:

You can provide accounts as a literal list or a file path:

• *Literal*: Enter parameters in the shorthand syntax format account_ID, account_ID, as shown in the following example.

111111222222,333333444444

 File path: The location of the file containing a list of Amazon accounts where stack set instances should be created/updated, entered in the format InputArtifactName::AccountsFileName. If you use file path to specify either accounts or OrganizationalUnitIds, the file format must be in JSON, as shown in the following example.

SourceArtifact::accounts.txt

The following example shows the file contents for accounts.txt.

```
[
"11111222222"
]
```

The following example shows the file contents for accounts.txt when listing more than one account:

The CloudFormationStackSet action

```
[
"111111222222","333333444444"
]
```

OrganizationalUnitIds:

🚺 Note

This parameter is optional for the SERVICE_MANAGED permissions model and is not used for the SELF_MANAGED permissions model. Do not use this if you select **OrganizationsAutoDeployment**.

The Amazon organizational units in which to update associated stack instances.

You can provide organizational unit IDs as a literal list or a file path:

• Literal: Enter an array of strings separated by commas, as shown in the following example.

ou-examplerootid111-exampleouid111,ou-examplerootid222-exampleouid222

• *File path:* The location of the file containing a list of OrganizationalUnitIds in which to create or update stack set instances. If you use file path to specify either **accounts** or **OrganizationalUnitIds**, the file format must be in JSON, as shown in the following example.

Enter a path to the file in the format InputArtifactName::OrganizationalUnitIdsFileName.

```
SourceArtifact::OU-IDs.txt
```

The following example shows the file contents for OU-IDs.txt:

```
[ "ou-examplerootid111-exampleouid111", "ou-examplerootid222-exampleouid222" ]
```

Regions

Required: No

The CloudFormationStackSet action

🚯 Note

When this parameter is selected, you must also select **DeploymentTargets**.

A list of Amazon Regions where stack set instances are created or updated. Regions are updated in the order in which they are entered.

Enter a list of valid Amazon Regions in the format Region1, Region2, as shown in the following example.

us-west-2,us-east-1

FailureTolerancePercentage

Required: No

The percentage of accounts per Region for which this stack operation can fail before Amazon CloudFormation stops the operation in that Region. If the operation is stopped in a Region, Amazon CloudFormation doesn't attempt the operation in subsequent Regions. When calculating the number of accounts based on the specified percentage, Amazon CloudFormation rounds *down* to the next whole number.

MaxConcurrentPercentage

Required: No

The maximum percentage of accounts in which to perform this operation at one time. When calculating the number of accounts based on the specified percentage, Amazon CloudFormation rounds *down* to the next whole number. If rounding down would result in zero, Amazon CloudFormation sets the number as one instead. Although you use this setting to specify the *maximum*, for large deployments the actual number of accounts acted upon concurrently may be lower due to service throttling.

RegionConcurrencyType

Required: No

You can specify if the stack set should deploy across Amazon Web Services Regions sequentially or in parallel by configuring the Region concurrency deployment parameter. When the Region concurrency is specified to deploy stacks across multiple Amazon Web Services Regions in parallel, this can result in faster overall deployment times.

- *Parallel*: Stack set deployments will be conducted at the same time, as long as a Region's deployment failures don't exceed a specified failure tolerance.
- *Sequential*: Stack set deployments will be conducted one at a time, as long as a Region's deployment failures don't exceed a specified failure tolerance. Sequential deployment is the default selection.

ConcurrencyMode

Required: No

The concurrency mode allows you to choose how the concurrency level behaves during stack set operations, whether with strict or soft failure tolerance. **Strict Failure Tolerance** lowers the deployment speed as stack set operation failures occur because concurrency decreases for each failure. **Soft Failure Tolerance** prioritizes deployment speed while still leveraging Amazon CloudFormation safety capabilities.

- STRICT_FAILURE_TOLERANCE: This option dynamically lowers the concurrency level to ensure the number of failed accounts never exceeds a particular failure tolerance. This is the default behavior.
- SOFT_FAILURE_TOLERANCE: This option decouples failure tolerance from the actual concurrency. This allows stack set operations to run at a set concurrency level, regardless of the number of failures.

CallAs

Required: No

Note

This parameter is optional for the SERVICE_MANAGED permissions model and is not used for the SELF_MANAGED permissions model.

Specifies whether you are acting in the organization's management account or as a delegated administrator in a member account.

Note

If this parameter is set to DELEGATED_ADMIN, make sure that the pipeline IAM role has organizations:ListDelegatedAdministrators permission. Otherwise, the

action will fail while running with an error similar to the following: Account used is not a delegated administrator.

- SELF: Stack set deployment will use service-managed permissions while signed in to the management account.
- DELEGATED_ADMIN: Stack set deployment will use service-managed permissions while signed in to a delegated administrator account.

Input artifacts

You must include at least one input artifact that contains the template for the stack set in a CloudFormationStackSet action. You can include more input artifacts for lists of deployment targets, accounts, and parameters.

- Number of artifacts: 1 to 3
- **Description:** You can include artifacts to provide:
 - The stack template file. (See the TemplatePath parameter.)
 - The parameters file. (See the Parameters parameter.)
 - The accounts file. (See the DeploymentTargets parameter.)

Output artifacts

- Number of artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Output variables

If you configure this action, it produces variables that can be referenced by the action configuration of a downstream action in the pipeline. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

- **StackSetId**: The ID of the stack set.
- **OperationId**: The ID of the stack set operation.

For more information, see Variables reference.

Example CloudFormationStackSet action configuration

The following examples show the action configuration for the **CloudFormationStackSet** action.

Example for the self-managed permissions model

The following example shows a **CloudFormationStackSet** action where the deployment target entered is an Amazon account ID.

YAML

```
Name: CreateStackSet
ActionTypeId:
  Category: Deploy
 Owner: AWS
  Provider: CloudFormationStackSet
 Version: '1'
RunOrder: 1
Configuration:
  DeploymentTargets: '111111222222'
  FailureTolerancePercentage: '20'
 MaxConcurrentPercentage: '25'
  PermissionModel: SELF_MANAGED
  Regions: us-east-1
  StackSetName: my-stackset
  TemplatePath: 'SourceArtifact::template.json'
OutputArtifacts: []
InputArtifacts:
  - Name: SourceArtifact
Region: us-west-2
Namespace: DeployVariables
```

JSON

```
{
    "Name": "CreateStackSet",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "CloudFormationStackSet",
        "Version": "1"
```

```
},
    "RunOrder": 1,
    "Configuration": {
        "DeploymentTargets": "111111222222",
        "FailureTolerancePercentage": "20",
        "MaxConcurrentPercentage": "25",
        "PermissionModel": "SELF_MANAGED",
        "Regions": "us-east-1",
        "StackSetName": "my-stackset",
        "TemplatePath": "SourceArtifact::template.json"
    },
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "SourceArtifact"
        }
    ],
    "Region": "us-west-2",
    "Namespace": "DeployVariables"
}
```

Example for the service-managed permissions model

The following example shows a **CloudFormationStackSet** action for the service-managed permissions model where the option for auto deployment to Amazon Organizations is enabled with stack retention.

YAML

```
Name: Deploy
ActionTypeId:
  Category: Deploy
  Owner: AWS
  Provider: CloudFormationStackSet
  Version: '1'
RunOrder: 1
Configuration:
  Capabilities: 'CAPABILITY_IAM,CAPABILITY_NAMED_IAM'
  OrganizationsAutoDeployment: EnabledWithStackRetention
  PermissionModel: SERVICE_MANAGED
  StackSetName: stacks-orgs
  TemplatePath: 'SourceArtifact::template.json'
```

```
OutputArtifacts: []
InputArtifacts:
    - Name: SourceArtifact
Region: eu-central-1
Namespace: DeployVariables
```

JSON

```
{
    "Name": "Deploy",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "CloudFormationStackSet",
        "Version": "1"
    },
    "RunOrder": 1,
    "Configuration": {
        "Capabilities": "CAPABILITY_IAM, CAPABILITY_NAMED_IAM",
        "OrganizationsAutoDeployment": "EnabledWithStackRetention",
        "PermissionModel": "SERVICE_MANAGED",
        "StackSetName": "stacks-orgs",
        "TemplatePath": "SourceArtifact::template.json"
    },
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "SourceArtifact"
        }
    ],
    "Region": "eu-central-1",
    "Namespace": "DeployVariables"
}
```

The CloudFormationStackInstances action

This action creates new instances and deploys stack sets to specified instances. A stack instance is a reference to a stack in a target account within a Region. A stack instance can exist without a stack; for example, if the stack creation is not successful, the stack instance shows the reason for stack creation failure. A stack instance is associated with only one stack set.

The CloudFormationStackInstances action

Amazon CodePipeline

After the initial creation of a stack set, you can add new stack instances by using CloudFormationStackInstances. Template parameter values can be overridden at the stack instance level during create or update stack set instance operations.

Each stack set has one template and set of template parameters. When you update the template or template parameters, you update them for the entire set. Then all instance statuses are set to OUTDATED until the changes are deployed to that instance.

To override parameter values on specific instances, for example, if the template contains a parameter for stage with a value of prod, you can override the value of that parameter to be beta or gamma.

Topics

- Action type
- Configuration parameters
- Input artifacts
- Output artifacts
- Output variables
- Example action configuration

Action type

- Category: Deploy
- Owner: AWS
- Provider: CloudFormationStackInstances
- Version: 1

Configuration parameters

StackSetName

Required: Yes

The name to associate with the stack set. This name must be unique in the Region where it is created.

The CloudFormationStackInstances action

The name may only contain alphanumeric and hyphen characters. It must begin with an alphabetic character and be 128 characters or fewer.

DeploymentTargets

Required: No

Note

For the SERVICE_MANAGED permissions model, you can provide either the organization root ID or organizational Unit IDs for deployment targets. For the SELF_MANAGED permissions model, you can only provide accounts.

Note

When this parameter is selected, you must also select **Regions**.

A list of Amazon accounts or organizational unit IDs where stack set instances should be created/updated.

Accounts:

You can provide accounts as a literal list or a file path:

• *Literal*: Enter parameters in the shorthand syntax format account_ID, account_ID, as shown in the following example.

111111222222,333333444444

 File path: The location of the file containing a list of Amazon accounts where stack set instances should be created/updated, entered in the format InputArtifactName::AccountsFileName. If you use file path to specify either accounts or OrganizationalUnitIds, the file format must be in JSON, as shown in the following example.

SourceArtifact::accounts.txt

The following example shows the file contents for accounts.txt:

```
[
"111111222222"
]
```

The following example shows the file contents for accounts.txt when listing more than one account:

```
[
"11111222222","333333444444"
]
```

OrganizationalUnitIds:

🚯 Note

This parameter is optional for the SERVICE_MANAGED permissions model and is not used for the SELF_MANAGED permissions model. Do not use this if you select **OrganizationsAutoDeployment**.

The Amazon organizational units in which to update associated stack instances.

You can provide organizational unit IDs as a literal list or a file path.

• *Literal*: Enter an array of strings separated by commas, as shown in the following example.

ou-examplerootid111-exampleouid111,ou-examplerootid222-exampleouid222

• *File path:* The location of the file containing a list of OrganizationalUnitIds in which to create or update stack set instances. If you use file path to specify either **accounts** or **OrganizationalUnitIds**, the file format must be in JSON, as shown in the following example.

Enter a path to the file in the format InputArtifactName::OrganizationalUnitIdsFileName.

```
SourceArtifact::OU-IDs.txt
```

The following example shows the file contents for OU-IDs.txt:

Ε

]

"ou-examplerootid111-exampleouid111","ou-examplerootid222-exampleouid222"

Regions

Required: Yes

i Note

When this parameter is selected, you must also select **DeploymentTargets**.

A list of Amazon Regions where stack set instances are created or updated. Regions are updated in the order in which they are entered.

Enter a list of valid Amazon Regions in the format: Region1, Region2, as shown in the following example.

us-west-2,us-east-1

ParameterOverrides

Required: No

A list of stack set parameters that you want to override in the selected stack instances. Overridden parameter values are applied to all stack instances in the specified accounts and Regions.

You can provide parameters as a literal list or a file path:

 You can enter parameters in the following shorthand syntax format: ParameterKey=string, ParameterValue=string, UsePreviousValue=boolean, ResolvedV ParameterKey=string, ParameterValue=string, UsePreviousValue=boolean, ResolvedV For more information about these data types, see Template parameter data types.

The following example shows a parameter named BucketName with the value amzn-s3demo-source-bucket.

ParameterKey=BucketName,ParameterValue=amzn-s3-demo-source-bucket

The following example shows an entry with multiple parameters.

```
ParameterKey=BucketName,ParameterValue=amzn-s3-demo-source-bucket
ParameterKey=Asset1,ParameterValue=true
ParameterKey=Asset2,ParameterValue=true
```

 You can enter the location of the file containing a list of template parameter overrides entered in the format InputArtifactName::ParameterOverridessFileName, as shown in the following example.

```
SourceArtifact::parameter-overrides.txt
```

The following example shows the file contents for parameter-overrides.txt.

FailureTolerancePercentage

Required: No

The percentage of accounts per Region for which this stack operation can fail before Amazon CloudFormation stops the operation in that Region. If the operation is stopped in a Region, Amazon CloudFormation doesn't attempt the operation in subsequent Regions. When calculating the number of accounts based on the specified percentage, Amazon CloudFormation rounds *down* to the next whole number.

MaxConcurrentPercentage

Required: No

The CloudFormationStackInstances action

The maximum percentage of accounts on which to perform this operation at one time. When calculating the number of accounts based on the specified percentage, Amazon CloudFormation rounds *down* to the next whole number. If rounding down would result in zero, Amazon CloudFormation sets the number as one instead. Although you specify the *maximum*, for large deployments the actual number of accounts acted upon concurrently may be lower due to service throttling.

RegionConcurrencyType

Required: No

You can specify if the stack set should deploy across Amazon Web Services Regions sequentially or in parallel by configuring the region concurrency deployment parameter. When the Region concurrency is specified to deploy stacks across multiple Amazon Web Services Regions in parallel, this can result in faster overall deployment times.

- *Parallel*: Stack set deployments will be conducted at the same time, as long as a Region's deployment failures don't exceed a specified failure tolerance.
- *Sequential*: Stack set deployments will be conducted one at a time, as long as a Region's deployment failures don't exceed a specified failure tolerance. Sequential deployment is the default selection.

ConcurrencyMode

Required: No

The concurrency mode allows you to choose how the concurrency level behaves during stack set operations, whether with strict or soft failure tolerance. **Strict Failure Tolerance** lowers the deployment speed as stack set operation failures occur because concurrency decreases for each failure. **Soft Failure Tolerance** prioritizes deployment speed while still leveraging Amazon CloudFormation safety capabilities.

- STRICT_FAILURE_TOLERANCE: This option dynamically lowers the concurrency level to ensure the number of failed accounts never exceeds a particular failure tolerance. This is the default behavior.
- SOFT_FAILURE_TOLERANCE: This option decouples failure tolerance from the actual concurrency. This allows stack set operations to run at a set concurrency level, regardless of the number of failures.

CallAs

Required: No

The CloudFormationStackInstances action

🚯 Note

This parameter is optional for the SERVICE_MANAGED permissions model and is not used for the SELF_MANAGED permissions model.

Specifies whether you are acting in the organization's management account or as a delegated administrator in a member account.

🚯 Note

If this parameter is set to DELEGATED_ADMIN, make sure that the pipeline IAM role has organizations:ListDelegatedAdministrators permission. Otherwise, the action will fail while running with an error similar to the following: Account used is not a delegated administrator.

- SELF: Stack set deployment will use service-managed permissions while signed in to the management account.
- DELEGATED_ADMIN: Stack set deployment will use service-managed permissions while signed in to a delegated administrator account.

Input artifacts

CloudFormationStackInstances can contain artifacts that list deployment targets and parameters.

- Number of artifacts: 0 to 2
- **Description:** As input, the stack set action optionally accepts artifacts for these purposes:
 - To provide the parameters file to use. (See the ParameterOverrides parameter.)
 - To provide the target accounts file to use. (See the DeploymentTargets parameter.)

Output artifacts

- Number of artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

- **StackSetId**: The ID of the stack set.
- **OperationId**: The ID of the stack set operation.

For more information, see Variables reference.

Example action configuration

The following examples show the action configuration for the **CloudFormationStackInstances** action.

Example for the self-managed permissions model

The following example shows a **CloudFormationStackInstances** action where the deployment target entered is an Amazon Web Services account ID 111111222222.

YAML

```
Name: my-instances
ActionTypeId:
   Category: Deploy
   Owner: AWS
   Provider: CloudFormationStackInstances
   Version: '1'
RunOrder: 2
Configuration:
   DeploymentTargets: '11111222222'
   Regions: 'us-east-1,us-east-2,us-west-1,us-west-2'
   StackSetName: my-stackset
OutputArtifacts: []
InputArtifacts:
   - Name: SourceArtifact
Region: us-west-2
```

JSON

{

The CloudFormationStackInstances action

```
"Name": "my-instances",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "CloudFormationStackInstances",
        "Version": "1"
    },
    "RunOrder": 2,
    "Configuration": {
        "DeploymentTargets": "111111222222",
        "Regions": "us-east-1, us-east-2, us-west-1, us-west-2",
        "StackSetName": "my-stackset"
    },
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "SourceArtifact"
        }
    ],
    "Region": "us-west-2"
}
```

Example for the service-managed permissions model

The following example shows a **CloudFormationStackInstances** action for the service-managed permissions model where the deployment target is an Amazon Organizations organizational unit ID ou-1111-1example.

YAML

```
Name: Instances
ActionTypeId:
  Category: Deploy
  Owner: AWS
  Provider: CloudFormationStackInstances
  Version: '1'
RunOrder: 2
Configuration:
  DeploymentTargets: ou-1111-1example
  Regions: us-east-1
  StackSetName: my-stackset
OutputArtifacts: []
```

```
InputArtifacts:
    - Name: SourceArtifact
Region: eu-central-1
```

JSON

```
{
    "Name": "Instances",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Provider": "CloudFormationStackInstances",
        "Version": "1"
    },
    "RunOrder": 2,
    "Configuration": {
        "DeploymentTargets": "ou-1111-1example",
        "Regions": "us-east-1",
        "StackSetName": "my-stackset"
    },
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "SourceArtifact"
        }
    ],
    "Region": "eu-central-1"
}
```

Service role permissions: CloudFormationStackSet action

For Amazon CloudFormation StackSets actions, the following minimum permissions are required.

For the CloudFormationStackSet action, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": [
        "cloudformation:CreateStackSet",
        "cloudformation:UpdateStackSet",
        "cloudformation:CreateStackInstances",
        "cloudformation:DescribeStackSetOperation",
```

```
"cloudformation:DescribeStackSet",
    "cloudformation:ListStackInstances"
],
    "Resource": "resource_ARN"
},
```

Service role permissions: CloudFormationStackInstances action

For the CloudFormationStackInstances action, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": [
        "cloudformation:CreateStackInstances",
        "cloudformation:DescribeStackSetOperation"
    ],
    "Resource": "resource_ARN"
},
```

Permissions models for stack set operations

Because Amazon CloudFormation StackSets performs operations across multiple accounts, you must define the necessary permissions in those accounts before you can create the stack set. You can define permissions through self-managed permissions or service-managed permissions.

With self-managed permissions, you create the two IAM roles required by StackSets - an administrator role such as the AWSCloudFormationStackSetAdministrationRole in the account where you define the stack set and an execution role such as the AWSCloudFormationStackSetExecutionRole in each of the accounts where you deploy stack set instances. Using this permissions model, StackSets can deploy to any Amazon account in which the user has permissions to create an IAM role. For more information, see <u>Grant self-managed</u> <u>permissions</u> in the Amazon CloudFormation User Guide.

🚺 Note

Because Amazon CloudFormation StackSets performs operations across multiple accounts, you must define the necessary permissions in those accounts before you can create the stack set.

With service-managed permissions, you can deploy stack instances to accounts managed by Amazon Organizations. Using this permissions model, you don't have to create the necessary IAM roles because StackSets creates the IAM roles on your behalf. With this model, you can also enable automatic deployments to accounts that are added to the organization in the future. See <u>Enable</u> trusted access with Amazon Organizations in the Amazon CloudFormation User Guide.

Template parameter data types

The template parameters used in stack set operations include the following data types. For more information, see <u>DescribeStackSet</u>.

ParameterKey

- Description: The key associated with the parameter. If you don't specify a key and value for a particular parameter, Amazon CloudFormation uses the default value that is specified in the template.
- Example:

"ParameterKey=BucketName,ParameterValue=amzn-s3-demo-source-bucket"

ParameterValue

- Description: The input value associated with the parameter.
- Example:

"ParameterKey=BucketName,ParameterValue=amzn-s3-demo-source-bucket"

UsePreviousValue

- During a stack update, use the existing parameter value that the stack is using for a given parameter key. If you specify true, do not specify a parameter value.
- Example:

"ParameterKey=Asset1,UsePreviousValue=true"

Each stack set has one template and set of template parameters. When you update the template or template parameters, you update them for the entire set. Then all instance statuses are set to OUTDATED until the changes are deployed to that instance.

To override parameter values on specific instances, for example, if the template contains a parameter for stage with a value of prod, you can override the value of that parameter to be beta or gamma.

See also

The following related resources can help you as you work with this action.

- <u>Parameter types</u> This reference chapter in the *Amazon CloudFormation User Guide* provides more descriptions and examples for CloudFormation template parameters.
- Best practices For more information about best practices for deploying stack sets, see https://docs.amazonaws.cn/AWSCloudFormation/latest/UserGuide/stacksets-bestpractices.html in the Amazon CloudFormation User Guide.
- <u>Amazon CloudFormation API Reference</u> You can reference the following CloudFormation actions in the *Amazon CloudFormation API Reference* for more information about the parameters used in stack set operations:
 - The <u>CreateStackSet</u> action creates a stack set.
 - The <u>UpdateStackSet</u> action updates the stack set and associated stack instances in the specified accounts and Regions. Even if the stack set operation created by updating the stack set fails (completely or partially, below or above a specified failure tolerance), the stack set is updated with these changes. Subsequent CreateStackInstances calls on the specified stack set use the updated stack set.
 - The <u>CreateStackInstances</u> action creates a stack instance for all specified regions within all specified accounts on a self-managed permission model, or within all specified deployment targets on a service-managed permission model. You can override parameters for the instances created by this action. If the instances already exist, CreateStackInstances calls UpdateStackInstances with the same input parameters. When you use this action to create instances, it does not change the status of other stack instances.
 - The <u>UpdateStackInstances</u> action brings stack instances up to date with the stack set for all specified regions within all specified accounts on a self-managed permission model, or within all specified deployment targets on a service-managed permission model. You can override parameters for the instances updated by this action. When you use this action to update a subset of instances, it does not change the status of other stack instances.
 - The <u>DescribeStackSetOperation</u> action returns the description of the specified stack set operation.

• The DescribeStackSet action returns the description of the specified stack set.

Amazon CodeBuild build and test action reference

Allows you to run builds and tests as part of your pipeline. When you run a CodeBuild build or test action, commands specified in the buildspec are run inside of a CodeBuild container. All artifacts that are specified as input artifacts to a CodeBuild action are available inside of the container running the commands. CodeBuild can provide either a build or test action. For more information, see the <u>Amazon CodeBuild User Guide</u>.

When you use the CodePipeline wizard in the console to create a build project, the CodeBuild build project shows the source provider is CodePipeline. When you create a build project in the CodeBuild console, you cannot specify CodePipeline as the source provider, but adding the build action to your pipeline adjusts the source in the CodeBuild console. For more information, see <u>ProjectSource</u> in the *Amazon CodeBuild API Reference*.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: CodeBuild action
- Action declaration (CodeBuild example)
- See also

Action type

- Category: Build or Test
- Owner: AWS
- Provider: CodeBuild
- Version: 1

Amazon CodeBuild build and test action reference

Configuration parameters

ProjectName

Required: Yes

ProjectName is the name of the build project in CodeBuild.

PrimarySource

Required: Conditional

The value of the PrimarySource parameter must be the name of one of the input artifacts to the action. CodeBuild looks for the buildspec file and runs the buildspec commands in the directory that contains the unzipped version of this artifact.

This parameter is required if multiple input artifacts are specified for a CodeBuild action. When there is only one source artifact for the action, the PrimarySource artifact defaults to that artifact.

BatchEnabled

Required: No

The Boolean value of the BatchEnabled parameter allows the action to run multiple builds in the same build execution.

When this option is enabled, the CombineArtifacts option is available.

For pipeline examples with batch builds enabled, see <u>CodePipeline integration with CodeBuild</u> and batch builds.

BuildspecOverride

Required: No

An inline buildspec definition or buildspec file declaration that overrides the latest one defined in the build project, for this build only. The buildspec defined on the project is not changed.

If this value is set, it can be one of the following:

- An inline buildspec definition. For more information, see the syntax reference at <u>Buildspec</u> <u>syntax</u>.
- The path to an alternate buildspec file relative to the value of the built-in CODEBUILD_SRC_DIR environment variable or the path to an S3 bucket. The bucket must be

in the same Amazon Web Services Region as the build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::my-codebuild-sample2/buildspec.yml). If this value is not provided or is set to an empty string, the source code must contain a buildspec file in its root directory. For more information about adding a path, see <u>Buildspec File Name</u> and Storage Location.

Note

Since this property allows you to change the build commands that will run in the container, you should note that an IAM principal with the ability to call this API and set this parameter can override the default settings. Moreover, we encourage that you use a trustworthy buildspec location like a file in your source repository or a Amazon S3 bucket.

CombineArtifacts

Required: No

The Boolean value of the CombineArtifacts parameter combines all build artifacts from a batch build into a single artifact file for the build action.

To use this option, the BatchEnabled parameter must be enabled.

EnvironmentVariables

Required: No

The value of this parameter is used to set environment variables for the CodeBuild action in your pipeline. The value for the EnvironmentVariables parameter takes the form of a JSON array of environment variable objects. See the example parameter in <u>Action declaration</u> (CodeBuild example).

Each object has three parts, all of which are strings:

- name: The name or key of the environment variable.
- value: The value of the environment variable. When using the PARAMETER_STORE or SECRETS_MANAGER type, this value must be the name of a parameter you have already stored in Amazon Systems Manager Parameter Store or a secret you have already stored in Amazon Secrets Manager, respectively.

🚯 Note

We strongly discourage the use of environment variables to store sensitive values, especially Amazon credentials. When you use the CodeBuild console or Amazon CLI, environment variables are displayed in plain text. For sensitive values, we recommend that you use the SECRETS_MANAGER type instead.

• type: (Optional) The type of environment variable. Valid values are PARAMETER_STORE, SECRETS_MANAGER, or PLAINTEXT. When not specified, this defaults to PLAINTEXT.

🚯 Note

When you enter the name, value, and type for your environment variables configuration, especially if the environment variable contains CodePipeline output variable syntax, do not exceed the 1000-character limit for the configuration's value field. A validation error is returned when this limit is exceeded.

For more information, see <u>EnvironmentVariable</u> in the Amazon CodeBuild API Reference. For an example CodeBuild action with an environment variable that resolves to the GitHub branch name, see <u>Example: Use a BranchName variable with CodeBuild environment variables</u>.

Input artifacts

- Number of artifacts: 1 to 5
- **Description:** CodeBuild looks for the buildspec file and runs the buildspec commands from the directory of the primary source artifact. When either a single input source is specified or when more than one input source is specified for the CodeBuild action, the single artifact, or the primary artifact in the case of multiple input sources, must be set using the PrimarySource action configuration parameter in CodePipeline.

Each input artifact is extracted to its own directory, the locations of which are stored in environment variables. The directory for the primary source artifact is made available with \$CODEBUILD_SRC_DIR. The directories for all other input artifacts are made available with \$CODEBUILD_SRC_DIR_yourInputArtifactName.

🚯 Note

The artifact configured in your CodeBuild project becomes the input artifact used by the CodeBuild action in your pipeline.

Output artifacts

- Number of artifacts: 0 to 5
- **Description:** These can be used to make the artifacts that are defined in the CodeBuild buildspec file available to subsequent actions in the pipeline. When only one output artifact is defined, this artifact can be defined directly under the artifacts section of the buildspec file. When more than one output artifact is specified, all artifacts referenced must be defined as secondary artifacts in the buildspec file. The names of the output artifacts in CodePipeline must match the artifact identifiers in the buildspec file.

🚯 Note

The artifact configured in your CodeBuild project becomes the CodePipeline input artifact in your pipeline action.

If the CombineArtifacts parameter is selected for batch builds, the output artifact location contains the combined artifacts from multiple builds that were run in the same execution.

Output variables

This action will produce as variables all environment variables that were exported as part of the build. For more details on how to export environment variables, see <u>EnvironmentVariable</u> in the *Amazon CodeBuild API Guide*.

For more information about using CodeBuild environment variables in CodePipeline, see the examples in <u>CodeBuild action output variables</u>. For a list of the environment variables you can use in CodeBuild, see <u>Environment variables in build environments</u> in the *Amazon CodeBuild User Guide*.

Service role permissions: CodeBuild action

For CodeBuild support, add the following to your policy statement:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Action": [
        "codebuild:BatchGetBuilds",
        "codebuild:StartBuild",
        "codebuild:BatchGetBuildBatches",
        "codebuild:StartBuildBatch"
      ],
      "Resource": [
        "arn:aws:codebuild:*:{{customerAccountId}}:project/[[ProjectName]]"
      ],
      "Effect": "Allow"
    }
  ]
}
```

Action declaration (CodeBuild example)

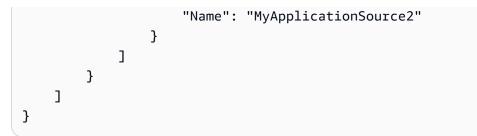
YAML

```
Name: Build
Actions:
  - Name: PackageExport
  ActionTypeId:
    Category: Build
    Owner: AWS
    Provider: CodeBuild
    Version: '1'
    RunOrder: 1
    Configuration:
    BatchEnabled: 'true'
    CombineArtifacts: 'true'
    ProjectName: my-build-project
    PrimarySource: MyApplicationSource1
```

```
EnvironmentVariables:
'[{"name":"TEST_VARIABLE","value":"TEST_VALUE","type":"PLAINTEXT"},
{"name":"ParamStoreTest","value":"PARAMETER_NAME","type":"PARAMETER_STORE"}]'
OutputArtifacts:
        - Name: MyPipeline-BuildArtifact
InputArtifacts:
        - Name: MyApplicationSource1
        - Name: MyApplicationSource2
```

JSON

```
{
    "Name": "Build",
    "Actions": [
        {
            "Name": "PackageExport",
            "ActionTypeId": {
                "Category": "Build",
                "Owner": "AWS",
                "Provider": "CodeBuild",
                "Version": "1"
            },
            "RunOrder": 1,
            "Configuration": {
                "BatchEnabled": "true",
                "CombineArtifacts": "true",
                "ProjectName": "my-build-project",
                "PrimarySource": "MyApplicationSource1",
                "EnvironmentVariables": "[{\"name\":\"TEST_VARIABLE\", \"value\":
\"TEST_VALUE\",\"type\":\"PLAINTEXT\"}, {\"name\":\"ParamStoreTest\", \"value\":
\"PARAMETER_NAME\",\"type\":\"PARAMETER_STORE\"}]"
            },
            "OutputArtifacts": [
                {
                     "Name": "MyPipeline-BuildArtifact"
                }
            ],
            "InputArtifacts": [
                {
                     "Name": "MyApplicationSource1"
                },
                ſ
```



See also

The following related resources can help you as you work with this action.

- <u>Amazon CodeBuild User Guide</u> For an example pipeline with a CodeBuild action, see <u>Use</u> <u>CodePipeline with CodeBuild to Test Code and Run Builds</u>. For examples of projects with multiple input and output CodeBuild artifacts, see <u>CodePipeline Integration with CodeBuild and Multiple</u> <u>Input Sources and Output Artifacts Sample</u> and <u>Multiple Input Sources and Output Artifacts</u> <u>Sample</u>.
- <u>Tutorial: Create a pipeline that builds and tests your Android app with Amazon Device Farm</u> This tutorial provides a sample buildspec file and sample application to create a pipeline with a GitHub source that builds and tests an Android app with CodeBuild and Amazon Device Farm.
- <u>Build Specification Reference for CodeBuild</u> This reference topic provides definitions and examples for understanding CodeBuild buildspec files. For a list of the environment variables you can use in CodeBuild, see <u>Environment variables in build environments</u> in the *Amazon CodeBuild User Guide*.

Amazon CodePipeline invoke action reference

You use a CodePipeline invoke action to simplify triggering downstream pipeline executions and passing pipeline variables and source revisions between pipelines.

🚯 Note

This action is only supported for V2 type pipelines.

Topics

- <u>Action type</u>
- <u>Configuration parameters</u>

- Input artifacts
- Output artifacts
- Service role policy permissions for the CodePipeline invoke action
- <u>Action declaration</u>
- See also

Action type

- Category: Invoke
- Owner: AWS
- Provider: CodePipeline
- Version: 1

Configuration parameters

PipelineName

Required: Yes

The name of the pipeline that will, upon running, start the current target pipeline. You must have already created the invoking pipeline. The action will start the s3-pipeline-test (target) pipeline when the (invoking) pipeline named my-s3-pipeline starts an execution.

SourceRevisions

Required: No

The source revisions that you want the target pipeline to use when it is started by the invoking pipeline. For example, an S3 source action provides output variables such as the S3 Version ID and Object Key. You can specify a revision value to be used when the pipeline is invoked.

For the CLI, you specify source revisions as a serialized JSON string. For more information about using source revision overrides, see SourceRevisionOverride in the *CodePipeline API Guide*.

The mapping uses a string format as shown in the following example:

```
[{"actionName":"Source","revisionType":"S3_OBJECT_VERSION_ID","revision
Value":"zq8mjNEXAMPLE"}]
```

Variables

Required: No

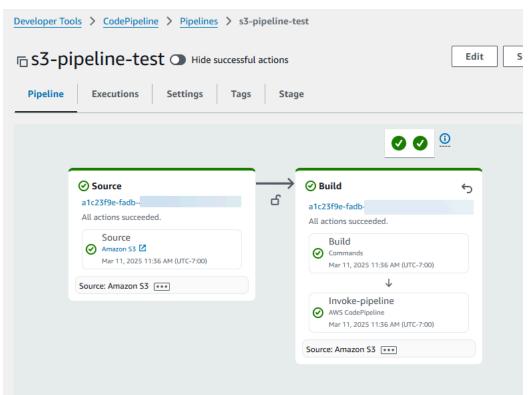
The names and values of variables that you want the action to support.

For the CLI, you specify variables as a serialized JSON string. For more information about using pipeline variables, see <u>PipelineVariable</u> in the *CodePipeline API Guide*.

The mapping uses a string format as shown in the following example:

```
[{"name":"VAR1","value":"VALUE1"}]
```

The following image shows an example of the action added to a pipeline in the console.



The following image shows an example of the **Edit** page for the action. In the following example, the pipeline named s3-pipeline-test has a pipeline invoke action configured as shown for the console. The action will start the s3-pipeline-test pipeline when the pipeline named my-s3-pipeline completes an execution. The example shows that source revision override for the S3_OBJECT_VERSION_ID source override with specified revision value of zq8mjNYEexample.

Edit action		×
Action name		
Choose a name for your action		
Invoke-pipeline		
No more than 100 characters		
Action provider		
AWS CodePipeline	▼	
Region		
United States (N. Virginia)	•	
Pipeline name Choose a pipeline that you have already created in the AW task.	S CodePipeline console. Or create a pipeline in the AWS CodePi	peline console and then return to this
Q my-s3-pipeline	×C	
Source Revision Overrides - optional Choose the action name, revision type, and revision value f CodePipeline. Action name Source	ror your CodePipeline source revisions. In the value field, you ca Revision type S3_OBJECT_VERSION_ID	n reference variables generated by
Revision value	1	
zq8mjNYE		
	Remove	
Add source revision override		
Variables - optional Choose the key and value for your CodePipeline pipeline va	ariables. In the value field, you can reference variables generate	d by CodePipeline.
Add pipeline variable		
Variable namespace - optional Choose a namespace for the output variables from this act configuration. Learn more	ion. You must choose a namespace if you want to use the variat	bles this action produces in your
1		
		Cancel Done

Input artifacts

- Number of artifacts: 0
- **Description:** Input artifacts do not apply for this action type.

Output artifacts

- Number of artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Service role policy permissions for the CodePipeline invoke action

When CodePipeline runs the action, the CodePipeline service role policy requires the codepipeline:StartPipelineExecution permission, appropriately scoped down to the pipeline resource ARN in order to maintain access with least privilege.

```
{
    "Sid": "StatementForPipelineInvokeAction",
    "Effect": "Allow",
    "Action": "codepipeline:StartPipelineExecution",
    "Resource": [
        "arn:aws:codepipeline:{{region}}:{{AccountId}}:{{pipelineName}}"
    ]
}
```

Action declaration

YAML

```
name: Invoke-pipeline
actionTypeId:
  category: Invoke
  owner: AWS
  provider: CodePipeline
  version: '1'
runOrder: 2
configuration:
  PipelineName: my-s3-pipeline
  SourceRevisions:
  '[{"actionName":"Source","revisionType":"S3_OBJECT_VERSION_ID","revision
Value":"zq8mjNEXAMPLE"}]'
  Variables: '[{"name":"VAR1","value":"VALUE1"}]'
```

JSON

```
{
    "name": "Invoke-pipeline",
    "actionTypeId": {
        "category": "Invoke",
        "owner": "AWS",
        "provider": "CodePipeline",
        "version": "1"
    },
    "runOrder": 2,
    "configuration": {
        "PipelineName": "my-s3-pipeline",
        "SourceRevisions": "[{\"actionName\":\"Source\",\"revisionType\":
\"S3_OBJECT_VERSION_ID\",\"revisionValue\":\"zq8mjNEXAMPLE"}]",
        "Variables": "[{\"name\":\"VAR1\",\"value\":\"VALUE1\"}]"
    }
},
```

See also

The following related resources can help you as you work with this action.

• <u>Start a pipeline with a source revision override</u> – This section describes starting a pipeline with source revisions manually or through the EventBridge event input transformer.

CodeCommit source action reference

Starts the pipeline when a new commit is made on the configured CodeCommit repository and branch.

If you use the console to create or edit the pipeline, CodePipeline creates an EventBridge rule that starts your pipeline when a change occurs in the repository.

🚯 Note

For Amazon ECR, Amazon S3, or CodeCommit sources, you can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and EventBridge</u> resources, <u>Connecting to Amazon S3 source actions with a source enabled for events</u>, or CodeCommit source actions and EventBridge.

You must have already created a CodeCommit repository before you connect the pipeline through a CodeCommit action.

After a code change is detected, you have the following options for passing the code to subsequent actions:

- Default Configures the CodeCommit source action to output a ZIP file with a shallow copy of your commit.
- **Full clone** Configures the source action to output a Git URL reference to the repository for subsequent actions.

Currently, the Git URL reference can only be used by downstream CodeBuild actions to clone the repo and associated Git metadata. Attempting to pass a Git URL reference to non-CodeBuild actions results in an error.

Topics

- <u>Action type</u>
- Configuration parameters
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: CodeCommit action
- Example action configuration
- See also

Action type

- Category: Source
- Owner: AWS
- Provider: CodeCommit

Configuration parameters

RepositoryName

Required: Yes

The name of the repository where source changes are to be detected.

BranchName

Required: Yes

The name of the branch where source changes are to be detected.

PollForSourceChanges

Required: No

PollForSourceChanges controls whether CodePipeline polls the CodeCommit repository for source changes. We recommend that you use CloudWatch Events to detect source changes instead. For more information about configuring CloudWatch Events, see <u>Migrate polling</u> pipelines (CodeCommit source) (CLI) or <u>Migrate polling pipelines (CodeCommit source) (Amazon CloudFormation template</u>).

🔥 Important

If you intend to configure a CloudWatch Events rule, you must set PollForSourceChanges to false to avoid duplicate pipeline executions.

Valid values for this parameter:

• true: If set, CodePipeline polls your repository for source changes.

i Note

If you omit PollForSourceChanges, CodePipeline defaults to polling your repository for source changes. This behavior is the same as if PollForSourceChanges is included and set to true. • false: If set, CodePipeline does not poll your repository for source changes. Use this setting if you intend to configure a CloudWatch Events rule to detect source changes.

OutputArtifactFormat

Required: No

The output artifact format. Values can be either CODEBUILD_CLONE_REF or CODE_ZIP. If unspecified, the default is CODE_ZIP.

🛕 Important

The CODEBUILD_CLONE_REF option can only be used by CodeBuild downstream actions.

If you choose this option, you need to add the codecommit:GitPull permission to your CodeBuild service role as shown in <u>Add CodeBuild GitClone permissions for</u> <u>CodeCommit source actions</u>. You also need to add the codecommit:GetRepository permission to your CodePipeline service role as shown in <u>Add permissions to the</u> <u>CodePipeline service role</u>. For a tutorial that shows you how to use the **Full clone** option, see <u>Tutorial: Use full clone with a CodeCommit pipeline source</u>.

Input artifacts

- Number of artifacts: 0
- **Description:** Input artifacts do not apply for this action type.

Output artifacts

- Number of artifacts: 1
- **Description:** The output artifact of this action is a ZIP file that contains the contents of the configured repository and branch at the commit specified as the source revision for the pipeline execution. The artifacts generated from the repository are the output artifacts for the CodeCommit action. The source code commit ID is displayed in CodePipeline as the source revision for the triggered pipeline execution.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information, see <u>Variables reference</u>.

CommitId

The CodeCommit commit ID that triggered the pipeline execution. Commit IDs are the full SHA of the commit.

CommitMessage

The description message, if any, associated with the commit that triggered the pipeline execution.

RepositoryName

The name of the CodeCommit repository where the commit that triggered the pipeline was made.

BranchName

The name of the branch for the CodeCommit repository where the source change was made.

AuthorDate

The date when the commit was authored, in timestamp format.

CommitterDate

The date when the commit was committed, in timestamp format.

Service role permissions: CodeCommit action

When CodePipeline runs the action, the CodePipeline service role policy requires the following permissions, appropriately scoped down to the pipeline resource ARN in order to maintain access with least privilege. For example, add the following to your policy statement:

Amazon CodePipeline

```
"Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "codecommit:CancelUploadArchive",
                "codecommit:GetBranch",
                "codecommit:GetCommit",
                "codecommit:GetRepository",
                "codecommit:GetUploadArchiveStatus",
                "codecommit:UploadArchive"
            ],
            "Resource": [
                "arn:aws:codecommit:*:{{customerAccountId}}:[[codecommitRepostories]]"
            ]
        }
    ]
}
```

Example action configuration

Example for default output artifact format

YAML

```
name: Source
actionTypeId:
 category: Source
 owner: AWS
  provider: CodeCommit
 version: '1'
runOrder: 1
configuration:
  BranchName: main
  PollForSourceChanges: 'false'
  RepositoryName: MyWebsite
outputArtifacts:
  - name: Artifact_MyWebsiteStack
inputArtifacts: []
region: us-west-2
namespace: SourceVariables
```

JSON

```
{
    "name": "Source",
    "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "provider": "CodeCommit",
        "version": "1"
    },
    "runOrder": 1,
    "configuration": {
        "BranchName": "main",
        "PollForSourceChanges": "false",
        "RepositoryName": "MyWebsite"
    },
    "outputArtifacts": [
        {
            "name": "Artifact_MyWebsiteStack"
        }
    ],
    "inputArtifacts": [],
    "region": "us-west-2",
    "namespace": "SourceVariables"
}
```

Example for full clone output artifact format

YAML

```
name: Source
actionTypeId:
  category: Source
  owner: AWS
  provider: CodeCommit
  version: '1'
runOrder: 1
configuration:
  BranchName: main
  OutputArtifactFormat: CODEBUILD_CLONE_REF
  PollForSourceChanges: 'false'
  RepositoryName: MyWebsite
```

```
outputArtifacts:
    - name: SourceArtifact
inputArtifacts: []
region: us-west-2
namespace: SourceVariables
```

JSON

```
{
    "name": "Source",
    "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "provider": "CodeCommit",
        "version": "1"
    },
    "runOrder": 1,
    "configuration": {
        "BranchName": "main",
        "OutputArtifactFormat": "CODEBUILD_CLONE_REF",
        "PollForSourceChanges": "false",
        "RepositoryName": "MyWebsite"
    },
    "outputArtifacts": [
        {
            "name": "SourceArtifact"
        }
    ],
    "inputArtifacts": [],
    "region": "us-west-2",
    "namespace": "SourceVariables"
}
```

See also

The following related resources can help you as you work with this action.

 <u>Tutorial: Create a simple pipeline (CodeCommit repository)</u> – This tutorial provides a sample app spec file and sample CodeDeploy application and deployment group. Use this tutorial to create a pipeline with a CodeCommit source that deploys to Amazon EC2 instances.

Amazon CodeDeploy deploy action reference

You use an Amazon CodeDeploy action to deploy application code to your deployment fleet. Your deployment fleet can consist of Amazon EC2 instances, on-premises instances, or both.

🚺 Note

This reference topic describes the CodeDeploy deployment action for CodePipeline where the deployment platform is Amazon EC2. For reference information about Amazon Elastic Container Service to CodeDeploy blue/green deployment actions in CodePipeline, see Amazon Elastic Container Service and CodeDeploy blue-green deploy action reference.

Topics

<u>Action type</u>

- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Service role permissions: Amazon CodeDeploy action
- <u>Action declaration</u>
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: CodeDeploy
- Version: 1

Configuration parameters

ApplicationName

Required: Yes

Amazon CodeDeploy deploy action reference

The name of the application that you created in CodeDeploy.

DeploymentGroupName

Required: Yes

The deployment group that you created in CodeDeploy.

Input artifacts

- Number of artifacts: 1
- Description: The AppSpec file that CodeDeploy uses to determine:
 - What to install onto your instances from your application revision in Amazon S3 or GitHub.
 - Which lifecycle event hooks to run in response to deployment lifecycle events.

For more information about the AppSpec file, see the <u>CodeDeploy AppSpec File Reference</u>.

Output artifacts

- Number of artifacts: 0
- Description: Output artifacts do not apply for this action type.

Service role permissions: Amazon CodeDeploy action

For Amazon CodeDeploy support, add the following to your policy statement:

```
{
    "Version": "2012-10-17",
    "Statement": [
    {
        "Effect": "Allow",
        "Action": [
            "codedeploy:CreateDeployment",
            "codedeploy:GetApplication",
            "codedeploy:GetDeployment",
            "codedeploy:RegisterApplicationRevision",
            "codedeploy:ListDeployments",
            "codedeploy:ListDeploymentGroups",
            "codedeploy:Li
```

```
"codedeploy:GetDeploymentGroup"
      ],
      "Resource": [
        "arn:aws:codedeploy:*:{{customerAccountId}}:application:
[[codedeployApplications]]",
        "arn:aws:codedeploy:*:{{customerAccountId}}:deploymentgroup:
[[codedeployApplications]]/*"
      ]
    },
    {
      "Effect": "Allow",
      "Action": [
        "codedeploy:GetDeploymentConfig"
      ],
      "Resource": [
        "arn:aws:codedeploy:*:{{customerAccountId}}:deploymentconfig:
[[deploymentConfigs]]"
      ]
    },
    {
      "Effect": "Allow",
      "Action": [
        "codedeploy:ListDeploymentConfigs"
      ],
      "Resource": [
        "*"
      ]
    }
  ]
}
```

Action declaration

YAML

```
Name: Deploy
Actions:
  - Name: Deploy
   ActionTypeId:
     Category: Deploy
   Owner: AWS
   Provider: CodeDeploy
   Version: '1'
```

```
RunOrder: 1
Configuration:
   ApplicationName: my-application
   DeploymentGroupName: my-deployment-group
OutputArtifacts: []
InputArtifacts:
   - Name: SourceArtifact
Region: us-west-2
Namespace: DeployVariables
```

JSON

```
{
    "Name": "Deploy",
    "Actions": [
        {
            "Name": "Deploy",
            "ActionTypeId": {
                "Category": "Deploy",
                "Owner": "AWS",
                "Provider": "CodeDeploy",
                "Version": "1"
            },
            "RunOrder": 1,
            "Configuration": {
                "ApplicationName": "my-application",
                "DeploymentGroupName": "my-deployment-group"
            },
            "OutputArtifacts": [],
            "InputArtifacts": [
                {
                     "Name": "SourceArtifact"
                }
            ],
            "Region": "us-west-2",
            "Namespace": "DeployVariables"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

- <u>Tutorial: Create a simple pipeline (S3 bucket)</u> This tutorial walks you through the creation of a source bucket, EC2 instances, and CodeDeploy resources to deploy a sample application. You then build your pipeline with a CodeDeploy deployment action that deploys code maintained in your S3 bucket to your Amazon EC2 instance.
- <u>Tutorial: Create a simple pipeline (CodeCommit repository)</u> This tutorial walks you through the creation of your CodeCommit source repository, EC2 instances, and CodeDeploy resources to deploy a sample application. You then build your pipeline with a CodeDeploy deployment action that deploys code from your CodeCommit repository to your Amazon EC2 instance.
- <u>CodeDeploy AppSpec File Reference</u> This reference chapter in the *Amazon CodeDeploy User Guide* provides reference information and examples for CodeDeploy AppSpec files.

CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com, and GitLab self-managed actions

Source actions for connections are supported by Amazon CodeConnections. CodeConnections allows you to create and manage connections between Amazon resources and third-party repositories such as GitHub. Starts a pipeline when a new commit is made on a third-party source code repository. The source action retrieves code changes when a pipeline is manually run or when a webhook event is sent from the source provider.

You can configure actions in your pipeline to use a Git configuration that allows you to start your pipeline with triggers. To configure the pipeline trigger configuration to filter with triggers, see more details in Add trigger with code push or pull request event types.

🚺 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Connections can associate your Amazon resources with the following third-party repositories:

• Bitbucket Cloud (through the **Bitbucket** provider option in the CodePipeline console or the Bitbucket provider in the CLI)

Note

You can create connections to a Bitbucket Cloud repository. Installed Bitbucket provider types, such as Bitbucket Server, are not supported.

Note

If you are using a Bitbucket workspace, you must have administrator access to create the connection.

• GitHub and GitHub Enterprise Cloud (through the **GitHub (via GitHub App)** provider option in the CodePipeline console or the GitHub provider in the CLI)

Note

If your repository is in a GitHub organization, you must be the organization owner to create the connection. If you are using a repository that is not in an organization, you must be the repository owner.

- GitHub Enterprise Server (through the **GitHub Enterprise Server** provider option in the CodePipeline console or the GitHub Enterprise Server provider in the CLI)
- GitLab.com (through the GitLab provider option in the CodePipeline console or the GitLab provider in the CLI)

Note

You can create connections to a repository where you have the **Owner** role in GitLab, and then the connection can be used with the repository with resources such as CodePipeline. For repositories in groups, you do not need to be the group owner.

 Self-managed installation for GitLab (Enterprise Edition or Community Edition) (through the GitLab self-managed provider option in the CodePipeline console or the GitLabSelfManaged provider in the CLI)

í) Note

Each connection supports all of the repositories you have with that provider. You only need to create a new connection for each provider type.

Connections allow your pipeline to detect source changes through the third-party provider's installation app. For example, webhooks are used to subscribe to GitHub event types and can be installed on an organization, a repository, or a GitHub App. Your connection installs a repository webhook on your GitHub App that subscribes to GitHub push type events.

After a code change is detected, you have the following options for passing the code to subsequent actions:

- Default: Like other existing CodePipeline source actions, CodeStarSourceConnection can output a ZIP file with a shallow copy of your commit.
- Full clone: CodeStarSourceConnection can also be configured to output a URL reference to the repo for subsequent actions.

Currently, the Git URL reference can only be used by downstream CodeBuild actions to clone the repo and associated Git metadata. Attempting to pass a Git URL reference to non-CodeBuild actions results in an error.

CodePipeline prompts you to add the Amazon Connector installation app to your third-party account when you create a connection. You must have already created your third-party provider account and repository before you can connect through the CodeStarSourceConnection action.

🚺 Note

To create or attach a policy to your role with the permissions required to use AWS CodeStar connections, see <u>Connections permissions reference</u>. Depending on when your CodePipeline service role was created, you might need to update its permissions to support AWS CodeStar connections. For instructions, see <u>Add permissions to the CodePipeline</u> <u>service role</u>.

(i) Note

To use connections in the Europe (Milan) Amazon Web Services Region, you must:

- 1. Install a Region-specific app
- 2. Enable the Region

This Region-specific app supports connections in the Europe (Milan) Region. It is published on the third-party provider site, and it is separate from the existing app supporting connections for other Regions. By installing this app, you authorize third-party providers to share your data with the service for this Region only, and you can revoke the permissions at any time by uninstalling the app.

The service will not process or store your data unless you enable the Region. By enabling this Region, you grant our service permissions to process and store your data.

Even if the Region is not enabled, third-party providers can still share your data with our service if the Region-specific app remains installed, so make sure to uninstall the app once you disable the Region. For more information, see <u>Enabling a Region</u>.

Topics

- Action type
- Configuration parameters
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: CodeConnections action
- <u>Action declaration</u>
- Installing the installation app and creating a connection
- See also

Action type

- Category: Source
- Owner: AWS

- Provider: CodeStarSourceConnection
- Version: 1

Configuration parameters

ConnectionArn

Required: Yes

The connection ARN that is configured and authenticated for the source provider.

FullRepositoryId

Required: Yes

The owner and name of the repository where source changes are to be detected.

Example: some-user/my-repo

🔥 Important

You must maintain the correct case for the **FullRepositoryId** value. For example, if your user name is some-user and repo name is My-Repo, the recommended value of **FullRepositoryId** is some-user/My-Repo.

BranchName

Required: Yes

The name of the branch where source changes are to be detected.

OutputArtifactFormat

Required: No

Specifies the output artifact format. Can be either CODEBUILD_CLONE_REF or CODE_ZIP. If unspecified, the default is CODE_ZIP.

🔥 Important

The CODEBUILD_CLONE_REF option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Add CodeBuild GitClone permissions for connections to</u> <u>Bitbucket, GitHub, GitHub Enterprise Server, or GitLab.com</u>. For a tutorial that shows you how to use the **Full clone** option, see <u>Tutorial: Use full clone with a GitHub pipeline</u> <u>source</u>.

DetectChanges

Required: No

Controls automatically starting your pipeline when a new commit is made on the configured repository and branch. If unspecified, the default value is true, and the field does not display by default. Valid values for this parameter:

- true: CodePipeline automatically starts your pipeline on new commits.
- false: CodePipeline does not start your pipeline on new commits.

Input artifacts

- Number of artifacts: 0
- **Description:** Input artifacts do not apply for this action type.

Output artifacts

- Number of artifacts: 1
- **Description:** The artifacts generated from the repository are the output artifacts for the CodeStarSourceConnection action. The source code commit ID is displayed in CodePipeline as the source revision for the triggered pipeline execution. You can configure the output artifact of this action in:
 - A ZIP file that contains the contents of the configured repository and branch at the commit specified as the source revision for the pipeline execution.
 - A JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly.

🛕 Important

This option can only be used by CodeBuild downstream actions. If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Troubleshooting CodePipeline</u>. For a tutorial that shows you how to use the **Full clone** option, see <u>Tutorial: Use full clone with a GitHub</u> pipeline source.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information, see Variables reference.

AuthorDate

The date when the commit was authored, in timestamp format.

BranchName

The name of the branch for the repository where the source change was made.

CommitId

The commit ID that triggered the pipeline execution.

CommitMessage

The description message, if any, associated with the commit that triggered the pipeline execution.

ConnectionArn

The connection ARN that is configured and authenticated for the source provider.

FullRepositoryName

The name of the repository where the commit that triggered the pipeline was made.

User Guide

Service role permissions: CodeConnections action

For CodeConnections, the following permission is required to create pipelines with a source that uses a connection, such as Bitbucket Cloud.

```
{
    "Effect": "Allow",
    "Action": [
        "codeconnections:UseConnection"
    ],
    "Resource": "resource_ARN"
},
```

For more information about the IAM permissions for connections, see <u>Connections permissions</u> reference.

Action declaration

In the following example, the output artifact is set to the default ZIP format of CODE_ZIP for the connection with ARN arn:aws:codestar-connections:region:accountid:connection/connection-id.

YAML

```
Name: Source
Actions:
  - InputArtifacts: []
   ActionTypeId:
      Version: '1'
      Owner: AWS
      Category: Source
      Provider: CodeStarSourceConnection
    OutputArtifacts:
      - Name: SourceArtifact
    RunOrder: 1
    Configuration:
      ConnectionArn: "arn:aws:codestar-connections:region:account-
id:connection/connection-id"
      FullRepositoryId: "some-user/my-repo"
      BranchName: "main"
      OutputArtifactFormat: "CODE_ZIP"
```

Name: ApplicationSource

JSON

```
{
    "Name": "Source",
    "Actions": [
        {
            "InputArtifacts": [],
            "ActionTypeId": {
                "Version": "1",
                "Owner": "AWS",
                "Category": "Source",
                "Provider": "CodeStarSourceConnection"
            },
            "OutputArtifacts": [
                {
                     "Name": "SourceArtifact"
                }
            ],
            "RunOrder": 1,
            "Configuration": {
                "ConnectionArn": "arn:aws:codestar-connections:region:account-
id:connection/connection-id",
                "FullRepositoryId": "some-user/my-repo",
                "BranchName": "main",
                "OutputArtifactFormat": "CODE_ZIP"
            },
            "Name": "ApplicationSource"
        }
    ]
},
```

Installing the installation app and creating a connection

The first time you use the console to add a new connection to a third-party repository, you must authorize CodePipeline access to your repositories. You choose or create an installation app that helps you connect to the account where you have created your third-party code repository.

When you use the Amazon CLI or an Amazon CloudFormation template, you must provide the connection ARN of a connection that has already gone through the installation handshake. Otherwise, the pipeline is not triggered.

🚺 Note

For a CodeStarSourceConnection source action, you do not have to set up a webhook or default to polling. The connections action manages your source change detection for you.

See also

The following related resources can help you as you work with this action.

- <u>AWS::CodeStarConnections::Connection</u> The Amazon CloudFormation template reference for the Amazon CodeStar Connections resource provides parameters and examples for connections in Amazon CloudFormation templates.
- <u>Amazon CodeStar Connections API Reference</u> The *Amazon CodeStar Connections API Reference* provides reference information for the available connections actions.
- To view the steps for creating a pipeline with source actions supported by connections, see the following:
 - For Bitbucket Cloud, use the **Bitbucket** option in the console or the CodestarSourceConnection action in the CLI. See <u>Bitbucket Cloud connections</u>.
 - For GitHub and GitHub Enterprise Cloud, use the **GitHub** provider option in the console or the CodestarSourceConnection action in the CLI. See <u>GitHub connections</u>.
 - For GitHub Enterprise Server, use the **GitHub Enterprise Server** provider option in the console or the CodestarSourceConnection action in the CLI. See <u>GitHub Enterprise Server</u> connections.
 - For GitLab.com, use the GitLab provider option in the console or the CodestarSourceConnection action with the GitLab provider in the CLI. See <u>GitLab.com</u> <u>connections</u>.
- To view a Getting Started tutorial that creates a pipeline with a Bitbucket source and a CodeBuild action, see <u>Getting started with connections</u>.

 For a tutorial that shows you how to connect to a GitHub repository and use the Full clone option with a downstream CodeBuild action, see <u>Tutorial</u>: Use full clone with a GitHub pipeline source.

Commands action reference

The Commands action allows you to run shell commands in a virtual compute instance. When you run the action, commands specified in the action configuration are run in a separate container. All artifacts that are specified as input artifacts to a CodeBuild action are available inside of the container running the commands. This action allows you to specify commands without first creating a CodeBuild project. For more information, see <u>ActionDeclaration</u> and <u>OutputArtifact</u> in the *Amazon CodePipeline API Reference*.

🔥 Important

This action uses CodePipeline managed CodeBuild compute to run commands in a build environment. Running the commands action will incur separate charges in Amazon CodeBuild.

🚯 Note

The Commands action is only available for V2 type pipelines.

Topics

- Considerations for the Commands action
- Service role policy permissions
- Action type
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Environment variables
- Service role permissions: Commands action
- Action declaration (example)

See also

Considerations for the Commands action

The following considerations apply for the Commands action.

• The commands action uses CodeBuild resources similar to the CodeBuild action, while allowing shell environment commands in a virtual compute instance without the need to associate or create a build project.

i Note

Running the commands action will incur separate charges in Amazon CodeBuild.

- Because the Commands action in CodePipeline uses CodeBuild resources, the builds run by the action will be attributed to the build limits for your account in CodeBuild. Builds run by the Commands action will count toward the concurrent build limits as configured for that account.
- The timeout for builds with the Commands action is 55 minutes, as based on CodeBuild builds.
- The compute instance uses an isolated build environment in CodeBuild.

Note

Because the isolated build environment is used at the account level, an instance might be reused for another pipeline execution.

- All formats are supported except multi-line formats. You must use single-line format when entering commands.
- The commands action is supported for cross-account actions. To add a cross-account commands action, add actionRoleArn from your target account in the action declaration.
- For this action, CodePipeline will assume the pipeline service role and use that role to allow access to resources at runtime. It is recommended to configure the service role so that the permissions are scoped down to the action level.
- The permissions added to the CodePipeline service role are detailed in <u>Add permissions to the</u> <u>CodePipeline service role</u>.
- The permission needed to view logs in the console is detailed in <u>Permissions required to view</u> compute logs in the CodePipeline console .

• Unlike other actions in CodePipeline, you do not set fields in the action configuration; you set the action configuration fields outside of the action configuration.

Service role policy permissions

When CodePipeline runs the action, CodePipeline creates a log group using the name of the pipeline as follows. This enables you to scope down permissions to log resources using the pipeline name.

/aws/codepipeline/MyPipelineName

If you are using an existing service role, to use the Commands action, you will need to add the following permissions for the service role.

- logs:CreateLogGroup
- logs:CreateLogStream
- logs:PutLogEvents

In the service role policy statement, scope down the permissions to the pipeline level as shown in the following example.

```
{
    "Effect": "Allow",
    "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
    ],
    "Resource": [
        "arn:aws:logs:*:YOUR_AWS_ACCOUNT_ID:log-group:/aws/
codepipeline/YOUR_PIPELINE_NAME",
        "arn:aws:logs:*:YOUR_AWS_ACCOUNT_ID:log-group:/aws/
codepipeline/YOUR_PIPELINE_NAME:*"
    ]
}
```

To view logs in the console using the action details dialog page, the permission to view logs must be added to the console role. For more information, see the console permissions policy example in Permissions required to view compute logs in the CodePipeline console.

Service role policy permissions

Action type

- Category: Compute
- Owner: AWS
- Provider: Commands
- Version: 1

Configuration parameters

Commands

Required: Yes

You can provide shell commands for the Commands action to run. In the console, commands are entered on separate lines. In the CLI, commands are entered as separate strings.

Note

Multi-line formats are not supported and will result in an error message. Single-line format must be used for entering commands in the **Commands** field.

🛕 Important

The EnvironmentType and ComputeType values match those in CodeBuild. We support a subset of the available types. For more information, see <u>Build Environment Compute</u> <u>Types</u>.

EnvironmentType

Required: No

The OS image for the build environment that supports the Commands action. The following are valid values for build environments:

- LINUX_CONTAINER
- WINDOWS_SERVER_2022_CONTAINER

The selection for **EnvironmentType** will then allow the compute type for that OS in the **ComputeType** field. For more information about the CodeBuild compute types available for this action, see the <u>Build environment compute modes and types</u> reference in the CodeBuild User Guide.

🚯 Note

If not specified, the compute defaults to the following for the build environment:

- **Compute type:** BUILD_GENERAL1_SMALL
- Environment type: LINUX_CONTAINER

ComputeType

Required: No

Based on the selection for EnvironmentType, the compute type can be provided. The following are available values for compute; however, note that the options available can vary by OS.

- BUILD_GENERAL1_SMALL
- BUILD_GENERAL1_MEDIUM
- BUILD_GENERAL1_LARGE

🔥 Important

Some compute types are not compatible with certain environment types. For example, WINDOWS_SERVER_2022_CONTAINER is not compatible with BUILD_GENERAL1_SMALL. Using incompatible combinations causes the action to fail and generates a runtime error.

outputVariables

Required: No

Specify the names of the variables in your environment that you want to export. For a reference of CodeBuild environment variables, see <u>Environment variables in build environments</u> in the *CodeBuild User Guide*.

Files

Required: No

You can provide files that you want to export as output artifacts for the action.

The supported format for files is the same as for CodeBuild file patterns. For example, enter **/ for all files. For more information, see <u>Build specification reference for CodeBuild</u> in the *CodeBuild User Guide*.

Edit action \times Action name Choose a name for your action Commands No more than 100 characters Action provider Commands • 67 Input artifacts Choose an input artifact for this action. Learn more [¥ SourceArtifact \times Defined by: Source No more than 100 characters Commands Specify the shell commands to run with your compute action in CodePipeline. You do not need to create any resources in CodeBuild. Note: Using compute time for this action will incur separate charges in AWS CodeBuild. ls echo "Hello World" Environment variables - optional Key value pair that is supplied to actions with managed compute. Name Value bedrock_api_token api_keys:bedrock Туре Secrets Manager • Remove Add environment variable VPC ID Specify the VPC ID that your compute action will use. Q Additional configuration Environment type, compute Environment Type LINUX_CONTAINER Ŧ Compute 3 GB memory, 2 vCPUs O 7 GB memory, 4 vCPUs 15 GB memory, 8 vCPUs Variable namespace - optional Choose a namespace for the output variables from this action. You must choose a namespace if you want to use the variables this action produces in your configuration. Learn more [buildcommands Cancel Done

VpcId

Required: No

The VPC ID for your resources.

Subnets

Required: No

The subnets for the VPC. This field is needed when your commands need to connect to resources in a VPC.

SecurityGroupIds

Required: No

The security groups for the VPC. This field is needed when your commands need to connect to resources in a VPC.

The following is a JSON example of the action with configuration fields shown for environment and compute type, along with example environment variable.

```
{
           "name": "Commands1",
           "actionTypeId": {
             "category": "Compute",
             "owner": "AWS",
             "provider": "Commands",
             "version": "1"
           },
           "inputArtifacts": [
             {
               "name": "SourceArtifact"
             }
           ],
           "commands": [
             "ls",
             "echo hello",
             "echo $BEDROCK_TOKEN",
           ],
           "configuration": {
             "EnvironmentType": "LINUX_CONTAINER",
```

```
"ComputeType": "BUILD_GENERAL1_MEDIUM"
},
"environmentVariables": [
    {
        "name": "BEDROCK_TOKEN",
        "value": "apiTokens:bedrockToken",
        "type": "SECRETS_MANAGER"
    }
],
"runOrder": 1
}
```

Input artifacts

• Number of artifacts: 1 to 10

Output artifacts

• Number of artifacts: 0 to 1

Environment variables

Key

The key in a key-value environment variable pair, such as BEDROCK_TOKEN.

Value

The value for the key-value pair, such as apiTokens:bedrockToken. The value can be parameterized with output variables from pipeline actions or pipeline variables.

When using the SECRETS_MANAGER type, this value must be the name of a secret you have already stored in Amazon Secrets Manager.

Туре

Specifies the type of use for the environment variable value. The value can be either PLAINTEXT or SECRETS_MANAGER. If the value is SECRETS_MANAGER, provide the Secrets reference in the EnvironmentVariable value. When not specified, this defaults to PLAINTEXT.

🚯 Note

We strongly discourage the use of *plaintext* environment variables to store sensitive values, especially Amazon credentials. When you use the CodeBuild console or Amazon CLI, *plaintext* environment variables are displayed in plain text. For sensitive values, we recommend that you use the SECRETS_MANAGER type instead.

🚺 Note

When you enter the name, value, and type for your environment variables configuration, especially if the environment variable contains CodePipeline output variable syntax, do not exceed the 1000-character limit for the configuration's value field. A validation error is returned when this limit is exceeded.

For an example action declaration showing an environment variable, see Configuration parameters.

🚯 Note

- The SECRETS_MANAGER type is only supported for the Commands action.
- Secrets referenced in the Commands action will be redacted in the build logs similar to CodeBuild. But pipeline users who have **Edit** access to the pipeline can still potentially access these secret values by modifying the commands.
- To use the SecretsManager, you must add the following permissions to your pipeline service role:

```
{
    "Effect": "Allow",
    "Action": [
        "secretsmanager:GetSecretValue"
],
    "Resource": [
        "SECRET_ARN"
   ]
}
```

Service role permissions: Commands action

For Commands support, add the following to your policy statement:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogGroup",
                "logs:CreateLogStream",
                "logs:PutLogEvents"
            ],
            "Resource": [
                "arn:aws:logs:{{region}}:{{customerAccountId}}:log-group:/aws/
codepipeline/{{pipelineName}}",
                "arn:aws:logs:{{region}}:{{customerAccountId}}:log-group:/aws/
codepipeline/{{pipelineName}}:log-stream:*"
            1
        }
    ]
}
```

Action declaration (example)

YAML

```
name: Commands_action
actionTypeId:
    category: Compute
    owner: AWS
    provider: Commands
    version: '1'
runOrder: 1
configuration: {}
commands:
    ls
    echo hello
    - 'echo pipeline Execution Id is #{codepipeline.PipelineExecutionId}'
outputArtifacts:
    name: BuildArtifact
```

```
files:
  - **/
inputArtifacts:
  - name: SourceArtifact
outputVariables:
  - AWS_DEFAULT_REGION
region: us-east-1
namespace: compute
```

JSON

```
{
    "name": "Commands_action",
    "actionTypeId": {
        "category": "Compute",
        "owner": "AWS",
        "provider": "Commands",
        "version": "1"
    },
    "runOrder": 1,
    "configuration": {},
    "commands": [
        "ls",
        "echo hello",
        "echo pipeline Execution Id is #{codepipeline.PipelineExecutionId}"
    ],
    "outputArtifacts": [
        {
            "name": "BuildArtifact",
            "files": [
                "**/"
            ]
        }
    ],
    "inputArtifacts": [
        {
            "name": "SourceArtifact"
        }
    ],
    "outputVariables": [
        "AWS_DEFAULT_REGION"
    ],
    "region": "us-east-1",
```

User Guide

```
"namespace": "compute"
```

See also

}

The following related resources can help you as you work with this action.

• <u>Tutorial: Create a pipeline that runs commands with compute (V2 type)</u> – This tutorial provides a sample pipeline with the Commands action.

Amazon Device Farm test action reference

In your pipeline, you can configure a test action that uses Amazon Device Farm to run and test your application on devices. Device Farm uses test pools of devices and testing frameworks to test applications on specific devices. For information about the types of testing frameworks supported by the Device Farm action, see <u>Working with Test Types in Amazon Device Farm</u>.

Note: The CodePipeline actions for Device Farm and GitHub are not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service</u> integrations with CodePipeline.

Topics

- <u>Action type</u>
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Service role permissions: Amazon Device Farm action
- Action declaration
- See also

Action type

- Category: Test
- Owner: AWS
- Provider: DeviceFarm

• Version: 1

Configuration parameters

АррТуре

Required: Yes

The OS and type of application you are testing. The following is a list of valid values:

- i0S
- Android
- Web

ProjectId

Required: Yes

The Device Farm project ID.

To find your project ID, in the Device Farm console, choose your project. In the browser, copy the URL of your new project. The URL contains the project ID. The project ID is the value in the URL after projects/. In the following example, the project ID is eec4905f-98f8-40aa-9afc-4c1cfexample.

```
https://<region-URL>/devicefarm/home?region=us-west-2#/projects/
eec4905f-98f8-40aa-9afc-4c1cfexample/runs
```

Арр

Required: Yes

The name and location of the application file in your input artifact. For example: s3-ios-test-1.ipa

TestSpec

Conditional: Yes

The location of the test spec definition file in your input artifact. This is required for custom mode test.

DevicePoolArn

Required: Yes

The Device Farm device pool ARN.

To get the available device pool ARNs for the project, including the ARN for Top Devices, use the Amazon CLI to enter the following command:

```
aws devicefarm list-device-pools --arn arn:aws:devicefarm:us-
west-2:account_ID:project:project_ID
```

TestType

Required: Yes

Specifies the supported testing framework for your test. The following is a list of valid values for TestType:

- APPIUM_JAVA_JUNIT
- APPIUM_JAVA_TESTNG
- APPIUM_NODE
- APPIUM_RUBY
- APPIUM_PYTHON
- APPIUM_WEB_JAVA_JUNIT
- APPIUM_WEB_JAVA_TESTNG
- APPIUM_WEB_NODE
- APPIUM_WEB_RUBY
- APPIUM_WEB_PYTHON
- BUILTIN_FUZZ
- INSTRUMENTATION
- XCTEST
- XCTEST_UI

🚯 Note

The following test types are not supported by the action in CodePipeline: WEB_PERFORMANCE_PROFILE, REMOTE_ACCESS_RECORD, and REMOTE_ACCESS_REPLAY.

For information about Device Farm test types, see <u>Working with Test Types in Amazon Device</u> <u>Farm</u>.

RadioBluetoothEnabled

Required: No

A Boolean value that indicates whether to enable Bluetooth at the beginning of the test.

RecordAppPerformanceData

Required: No

A Boolean value that indicates whether to record device performance data such as CPU, FPS, and memory performance during the test.

RecordVideo

Required: No

A Boolean value that indicates whether to record video during the test.

RadioWifiEnabled

Required: No

A Boolean value that indicates whether to enable Wi-Fi at the beginning of the test.

RadioNfcEnabled

Required: No

A Boolean value that indicates whether to enable NFC at the beginning of the test.

RadioGpsEnabled

Required: No

A Boolean value that indicates whether to enable GPS at the beginning of the test.

Test

Required: No

The name and path of the test definition file in your source location. The path is relative to the root of the input artifact for your test.

FuzzEventCount

Required: No

The number of user interface events for the fuzz test to perform, between 1 and 10,000.

FuzzEventThrottle

Required: No

The number of milliseconds for the fuzz test to wait before performing the next user interface event, between 1 and 1,000.

FuzzRandomizerSeed

Required: No

A seed for the fuzz test to use for randomizing user interface events. Using the same number for subsequent fuzz tests results in identical event sequences.

CustomHostMachineArtifacts

Required: No

The location on the host machine where custom artifacts will be stored.

CustomDeviceArtifacts

Required: No

The location on the device where custom artifacts will be stored.

UnmeteredDevicesOnly

Required: No

A Boolean value that indicates whether to only use your unmetered devices when running tests in this step.

JobTimeoutMinutes

Required: No

The number of minutes a test run will execute per device before it times out.

Latitude

Required: No

The latitude of the device expressed in geographic coordinate system degrees.

Longitude

Required: No

The longitude of the device expressed in geographic coordinate system degrees.

Input artifacts

- Number of artifacts: 1
- **Description:** The set of artifacts to be made available to the test action. Device Farm looks for the built application and test definitions to use.

Output artifacts

- Number of Artifacts: 0
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: Amazon Device Farm action

When CodePipeline runs the action, the CodePipeline service role policy requires the following permissions, appropriately scoped down to the pipeline resource ARN in order to maintain access with least privilege. For example, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": [
        "devicefarm:ListProjects",
```

```
"devicefarm:ListDevicePools",
    "devicefarm:GetRun",
    "devicefarm:GetUpload",
    "devicefarm:CreateUpload",
    "devicefarm:ScheduleRun"
],
    "Resource": "resource_ARN"
},
```

Action declaration

```
YAML
```

```
Name: Test
Actions:
  - Name: TestDeviceFarm
   ActionTypeId: null
   category: Test
    owner: AWS
    provider: DeviceFarm
    version: '1'
RunOrder: 1
Configuration:
 App: s3-ios-test-1.ipa
 AppType: iOS
  DevicePoolArn: >-
    arn:aws:devicefarm:us-west-2::devicepool:0EXAMPLE-d7d7-48a5-ba5c-b33d66efa1f5
 ProjectId: eec4905f-98f8-40aa-9afc-4c1cfEXAMPLE
 TestType: APPIUM_PYTHON
  TestSpec: example-spec.yml
OutputArtifacts: []
InputArtifacts:
  - Name: SourceArtifact
Region: us-west-2
```

JSON

```
{
    "Name": "Test",
    "Actions": [
        {
            "Name": "TestDeviceFarm",
            "ActionTypeId": null,
            "Act
```

```
"category": "Test",
            "owner": "AWS",
            "provider": "DeviceFarm",
            "version": "1"
        }
    ],
    "RunOrder": 1,
    "Configuration": {
        "App": "s3-ios-test-1.ipa",
        "AppType": "iOS",
        "DevicePoolArn": "arn:aws:devicefarm:us-west-2::devicepool:@EXAMPLE-
d7d7-48a5-ba5c-b33d66efa1f5",
        "ProjectId": "eec4905f-98f8-40aa-9afc-4c1cfEXAMPLE",
        "TestType": "APPIUM_PYTHON",
        "TestSpec": "example-spec.yml"
    },
    "OutputArtifacts": [],
    "InputArtifacts": [
        {
            "Name": "SourceArtifact"
        }
    ],
    "Region": "us-west-2"
},
```

See also

The following related resources can help you as you work with this action.

- <u>Working with Test Types in Device Farm</u> This reference chapter in the *Device Farm Developer Guide* provides more description about the Android, iOS, and Web Application testing frameworks supported by Device Farm.
- <u>Actions in Device Farm</u> The API calls and parameters in the *Device Farm API Reference* can help you work with Device Farm projects.
- <u>Tutorial: Create a pipeline that builds and tests your Android app with Amazon Device Farm</u> This tutorial provides a sample build spec file and sample application to create a pipeline with a GitHub source that builds and tests an Android app with CodeBuild and Device Farm.
- <u>Tutorial: Create a pipeline that tests your iOS app with Amazon Device Farm</u> This tutorial provides a sample application to create a pipeline with an Amazon S3 source that tests a built iOS app with Device Farm.

Elastic Beanstalk deploy action reference

Elastic Beanstalk is a platform within Amazon that is used for deploying and scaling web applications. You use an Elastic Beanstalk action to deploy application code to your deployment environment.

Topics

- <u>Action type</u>
- Configuration parameters
- Input artifacts
- Output artifacts
- Service role permissions: ElasticBeanstalk deploy action
- Action declaration
- See also

Action type

- Category: Deploy
- Owner: AWS
- Provider: ElasticBeanstalk
- Version: 1

Configuration parameters

ApplicationName

Required: Yes

The name of the application that you created in Elastic Beanstalk.

EnvironmentName

Required: Yes

The name of the environment that you created in Elastic Beanstalk. An environment is a collection of Amazon resources running an application version. Each environment runs only one

application version at a time, however, you can run the same application version or different application versions in many environments simultaneously.

Input artifacts

- Number of artifacts: 1
- **Description:** The input artifact for the action.

Output artifacts

- Number of artifacts: Ø
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: ElasticBeanstalk deploy action

For Elastic Beanstalk, the following are the minimum permissions needed to create pipelines with an ElasticBeanstalk deploy action.

```
{
    "Effect": "Allow",
    "Action": [
        "elasticbeanstalk:*",
        "ec2:*",
        "elasticloadbalancing:*",
        "autoscaling:*",
        "cloudwatch:*",
        "s3:*",
        "sns:*",
        "cloudformation:*",
        "rds:*",
        "sqs:*",
        "ecs:*"
    ],
    "Resource": "resource_ARN"
},
```

(i) Note

You should replace wildcards in the resource policy with the resources for the account you want to limit access to. For more information about creating a policy that grants least-privilege access, see https://docs.aws.amazon.com/IAM/latest/UserGuide/best-practices.html#grant-least-privilege.

Action declaration

YAML

```
Name: Deploy
Actions:
  - Name: Deploy
   ActionTypeId:
      Category: Deploy
      Owner: AWS
      Provider: ElasticBeanstalk
      Version: '1'
    RunOrder: 1
    Configuration:
      ApplicationName: my-application
      EnvironmentName: my-environment
    OutputArtifacts: []
    InputArtifacts:
      - Name: SourceArtifact
    Region: us-west-2
    Namespace: DeployVariables
```

JSON

```
{
    "Name": "Deploy",
    "Actions": [
        {
            "Name": "Deploy",
            "ActionTypeId": {
                "Category": "Deploy",
                "Owner": "AWS",
                "Provider": "ElasticBeanstalk",
```

```
"Version": "1"
            },
            "RunOrder": 1,
            "Configuration": {
                 "ApplicationName": "my-application",
                 "EnvironmentName": "my-environment"
            },
            "OutputArtifacts": [],
             "InputArtifacts": [
                 {
                     "Name": "SourceArtifact"
                 }
            ],
            "Region": "us-west-2",
             "Namespace": "DeployVariables"
        }
    ]
},
```

See also

The following related resources can help you as you work with this action.

<u>Deploying a Flask application to Elastic Beanstalk</u> – This tutorial walks you through the creation
of your application and environment resources in Elastic Beanstalk using a sample Flask
application. You can then build your pipeline with an Elastic Beanstalk deployment action that
deploys your application from your source repository to your Elastic Beanstalk environment.

Amazon Inspector InspectorScan invoke action reference

Amazon Inspector is a vulnerability management service that automatically discovers workloads and continually scans them for software vulnerabilities and unintended network exposure. The InspectorScan action in CodePipeline automates detecting and fixing security vulnerabilities in your open source code. The action is a managed compute action with security scanning capabilities. You can use InspectorScan with application source code in your third-party repository, such as GitHub or Bitbucket Cloud, or with images for container applications. Your action will scan and report on vulnerability levels and alerts that you configure. Note: The CodePipeline action for **InspectorScan** is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with</u> CodePipeline.

🔥 Important

This action uses CodePipeline managed CodeBuild compute to run commands in a build environment. Running the action will incur separate charges in Amazon CodeBuild.

Topics

- Action type ID
- <u>Configuration parameters</u>
- Input artifacts
- Output artifacts
- Output variables
- Service role permissions: InspectorScan action
- Action declaration
- See also

Action type ID

- Category: Invoke
- Owner: AWS
- Provider: InspectorScan
- Version: 1

Example:

```
{
    "Category": "Invoke",
    "Owner": "AWS",
    "Provider": "InspectorScan",
    "Version": "1"
```

},

Configuration parameters

InspectorRunMode

(Required) The string that indicates the mode of the scan. Valid values are SourceCodeScan | ECRImageScan.

ECRRepositoryName

The name of the Amazon ECR repository where the image was pushed.

ImageTag

The tag used for the image.

The parameters for this action scan for levels of vulnerability that you specify. The following levels for vulnerability thresholds are available:

CriticalThreshold

The number of critical severity vulnerabilities found in your source beyond which CodePipeline should fail the action.

HighThreshold

The number of high severity vulnerabilities found in your source beyond which CodePipeline should fail the action.

MediumThreshold

The number of medium severity vulnerabilities found in your source beyond which CodePipeline should fail the action.

LowThreshold

The number of low severity vulnerabilities found in your source beyond which CodePipeline should fail the action.

Action name

Choose a name for your action

Scan

No more than 100 characters

Action provider

AWS InspectorScan

Region

US East (N. Virginia)

Input artifacts

Choose an input artifact for this action. Learn more 🛂

SourceArtifact X Defined by: Source

No more than 100 characters

Inspector Run mode

InspectorRunMode: SourceCodeScan or ECRImageScan.

O Source Code Scan

SourceCodeScan: Scan the source code. Choose an input artifact for this run mode.

ECR Image Scan
 ECRImageScan: Scan the ECR image.

T

Critical Threshold - optional

Threshold value for critical severity vulnerabilities to allow the action to succeed. Default: Integer.MAX_VALUE

High Threshold - optional

Threshold value for high severity vulnerabilities to allow the action to succeed. Default: Integer.MAX_VALUE

Medium Threshold - optional

Threshold value for medium severity vulnerabilities to allow the action to succeed. Default: Integer.MAX_VALUE

Low Threshold - optional

Threshold value for low severity vulnerabilities to allow the action to succeed. Default: Integer.MAX_VALUE

T

Input artifacts

- Number of artifacts: 1
- **Description:** The source code to scan for vulnerabilities. If the scan is for an ECR repository, this input artifact is not needed.

Output artifacts

- Number of artifacts: 1
- **Description:** Vulnerability details of your source in the form of a Software Bill of Materials (SBOM) file.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information, see Variables reference.

HighestScannedSeverity

The highest severity output from the scan. Valid values are medium | high | critical.

Service role permissions: InspectorScan action

For the InspectorScan action support, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": "inspector-scan:ScanSbom",
    "Resource": "*"
    },
    {
        "Effect": "Allow",
        "Action": [
           "ecr:GetDownloadUrlForLayer",
        "
```

```
"ecr:BatchGetImage",
    "ecr:BatchCheckLayerAvailability"
],
    "Resource": "resource_ARN"
},
```

In addition, if not already added for the Commands action, add the following permissions to your service role in order to view CloudWatch logs.

```
{
    "Effect": "Allow",
    "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
    ],
    "Resource": "resource_ARN"
},
```

i Note

Scope down the permissions to the pipeline resource level by using resource-based permissions in the service role policy statement.

Action declaration

YAML

```
name: Scan
actionTypeId:
   category: Invoke
   owner: AWS
   provider: InspectorScan
   version: '1'
runOrder: 1
configuration:
   InspectorRunMode: SourceCodeScan
outputArtifacts:
- name: output
inputArtifacts:
```

```
- name: SourceArtifact region: us-east-1
```

JSON

{

```
"name": "Scan",
    "actionTypeId": {
        "category": "Invoke",
        "owner": "AWS",
        "provider": "InspectorScan",
        "version": "1"
    },
    "runOrder": 1,
    "configuration": {
        "InspectorRunMode": "SourceCodeScan"
    },
    "outputArtifacts": [
        {
            "name": "output"
        }
    ],
    "inputArtifacts": [
        {
            "name": "SourceArtifact"
        }
    ],
    "region": "us-east-1"
},
```

See also

The following related resources can help you as you work with this action.

• For more information about Amazon Inspector, see the <u>Amazon Inspector</u> User Guide.

Amazon Lambda invoke action reference

Allows you to execute a Lambda function as an action in your pipeline. Using the event object that is an input to this function, the function has access to the action configuration, input

artifact locations, output artifact locations, and other information required to access the artifacts. For an example event passed to a Lambda invoke function, see <u>Example JSON event</u>. As part of the implementation of the Lambda function, there must be a call to either the <u>PutJobSuccessResult API</u> or <u>PutJobFailureResult API</u>. Otherwise, the execution of this action hangs until the action times out. If you specify output artifacts for the action, they must be uploaded to the S3 bucket as part of the function implementation.

🛕 Important

Do not log the JSON event that CodePipeline sends to Lambda because this can result in user credentials being logged in CloudWatch Logs. The CodePipeline role uses a JSON event to pass temporary credentials to Lambda in the artifactCredentials field. For an example event, see Example JSON event.

Action type

- Category: Invoke
- Owner: AWS
- Provider: Lambda
- Version: 1

Configuration parameters

FunctionName

Required: Yes

FunctionName is the name of the function created in Lambda.

UserParameters

Required: No

A string that can be processed as input by the Lambda function.

Input artifacts

- Number of Artifacts: 0 to 5
- **Description:** The set of artifacts to be made available to the Lambda function.

Output artifacts

- Number of Artifacts: 0 to 5
- **Description:** The set of artifacts produced as output by the Lambda function.

Output variables

This action will produce as variables all key-value pairs that are included in the outputVariables section of the <u>PutJobSuccessResult API</u> request.

For more information about variables in CodePipeline, see Variables reference.

Example action configuration

YAML

```
Name: Lambda
Actions:
   - Name: Lambda
   ActionTypeId:
     Category: Invoke
   Owner: AWS
     Provider: Lambda
     Version: '1'
   RunOrder: 1
   Configuration:
     FunctionName: myLambdaFunction
     UserParameters: 'http://192.0.2.4'
   OutputArtifacts: []
   InputArtifacts: []
   Region: us-west-2
```

JSON

```
User Guide
```

```
{
    "Name": "Lambda",
    "Actions": [
        {
            "Name": "Lambda",
            "ActionTypeId": {
                "Category": "Invoke",
                "Owner": "AWS",
                "Provider": "Lambda",
                "Version": "1"
            },
            "RunOrder": 1,
            "Configuration": {
                "FunctionName": "myLambdaFunction",
                "UserParameters": "http://192.0.2.4"
            },
            "OutputArtifacts": [],
            "InputArtifacts": [],
            "Region": "us-west-2"
        }
    ]
},
```

Example JSON event

The Lambda action sends a JSON event that contains the job ID, the pipeline action configuration, input and output artifact locations, and any encryption information for the artifacts. The job worker accesses these details to complete the Lambda action. For more information, see job details. The following is an example event.

```
}
            },
            "inputArtifacts": [
                {
                     "location": {
                         "s3Location": {
                             "bucketName": "bucket_name",
                             "objectKey": "filename"
                         },
                         "type": "S3"
                     },
                     "revision": null,
                     "name": "ArtifactName"
                }
            ],
            "outputArtifacts": [],
            "artifactCredentials": {
                 "secretAccessKey": "secret_key",
                "sessionToken": "session_token",
                "accessKeyId": "access_key_ID"
            },
            "continuationToken": "token_ID",
            "encryptionKey": {
              "id": "arn:aws:kms:us-
west-2:111122223333:key/1234abcd-12ab-34cd-56ef-1234567890ab",
               "type": "KMS"
            }
        }
    }
}
```

The JSON event provides the following job details for the Lambda action in CodePipeline:

- id: The unique system-generated ID of the job.
- accountId: The Amazon account ID associated with the job.
- data: Other information required for a job worker to complete the job.
 - actionConfiguration: The action parameters for the Lambda action. For definitions, see <u>Configuration parameters</u>.
 - inputArtifacts: The artifact supplied to the action.
 - location: The artifact store location.
 - s3Location: The input artifact location information for the action.

- bucketName: The name of the pipeline artifact store for the action (for example, an Amazon S3 bucket named codepipeline-us-east-2-1234567890).
- objectKey: The name of the application (for example, CodePipelineDemoApplication.zip).
- type: The type of artifact in the location. Currently, S3 is the only valid artifact type.
- revision: The artifact's revision ID. Depending on the type of object, this can be a commit ID (GitHub) or a revision ID (Amazon Simple Storage Service). For more information, see <u>ArtifactRevision</u>.
- name: The name of the artifact to be worked on, such as MyApp.
- outputArtifacts: The output of the action.
 - location: The artifact store location.
 - s3Location: The output artifact location information for the action.
 - bucketName: The name of the pipeline artifact store for the action (for example, an Amazon S3 bucket named codepipeline-us-east-2-1234567890).
 - objectKey: The name of the application (for example, CodePipelineDemoApplication.zip).
 - type: The type of artifact in the location. Currently, S3 is the only valid artifact type.
 - revision: The artifact's revision ID. Depending on the type of object, this can be a commit ID (GitHub) or a revision ID (Amazon Simple Storage Service). For more information, see <u>ArtifactRevision</u>.
 - name: The name of the output of an artifact, such as MyApp.
- artifactCredentials: The Amazon session credentials used to access input and output artifacts in the Amazon S3 bucket. These credentials are temporary credentials that are issued by Amazon Security Token Service (Amazon STS).
 - secretAccessKey: The secret access key for the session.
 - sessionToken: The token for the session.
 - accessKeyId: The secret access key for the session.
- continuationToken: A token generated by the action. Future actions use this token to identify the running instance of the action. When the action is complete, no continuation token should be supplied.

- encryptionKey: The encryption key used to encrypt the data in the artifact store, such as an Amazon KMS key. If this is undefined, the default key for Amazon Simple Storage Service is used.
 - id: The ID used to identify the key. For an Amazon KMS key, you can use the key ID, the key ARN, or the alias ARN.
 - type: The type of encryption key, such as an Amazon KMS key.

See also

The following related resources can help you as you work with this action.

- <u>Amazon CloudFormation User Guide</u> For more information about Lambda actions and Amazon CloudFormation artifacts for pipelines, see <u>Using Parameter Override Functions with</u> <u>CodePipeline Pipelines</u>, <u>Automating Deployment of Lambda-based Applications</u>, and <u>Amazon</u> CloudFormation Artifacts.
- Invoke an Amazon Lambda function in a pipeline in CodePipeline This procedure provides a sample Lambda function and shows you how to use the console to create a pipeline with a Lambda invoke action.

Amazon OpsWorks deploy action reference

You use an Amazon OpsWorks action to deploy with OpsWorks using your pipeline.

Action type

- Category: Deploy
- Owner: AWS
- Provider: OpsWorks
- Version: 1

Configuration parameters

Арр

Required: Yes

The Amazon OpsWorks stack. A stack is a container for your application infrastructure.

Stack

Required: Yes

The Amazon OpsWorks app. The app represents the code you want to deploy and run.

Layer

Required: No

The Amazon OpsWorks stack. A layer specifies the configuration and resources for a set of instances.

Input artifacts

- Number of artifacts: 1
- **Description:** This is the input artifact for your action.

Output artifacts

- Number of artifacts: 0 to 1
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: Amazon OpsWorks action

For Amazon OpsWorks support, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": [
        "opsworks:CreateDeployment",
        "opsworks:DescribeApps",
        "opsworks:DescribeCommands",
        "opsworks:DescribeDeployments",
        "opsworks:DescribeInstances",
        "opsworks:DescribeStacks",
        "opsworks:UpdateApp",
```

```
"opsworks:UpdateStack"
],
"Resource": "resource_ARN"
},
```

Example action configuration

YAML

```
Name: ActionName
ActionTypeId:
Category: Deploy
Owner: AWS
Version: 1
Provider: OpsWorks
InputArtifacts:
- Name: myInputArtifact
Configuration:
Stack: my-stack
App: my-app
```

JSON

```
{
    "Name": "ActionName",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Version": 1,
        "Provider": "OpsWorks"
    },
    "InputArtifacts": [
        {
            "Name": "myInputArtifact"
        }
    ],
    "Configuration": {
        "Stack": "my-stack",
        "App": "my-app"
    }
}
```

See also

The following related resources can help you as you work with this action.

• <u>Amazon OpsWorks User Guide</u> – For information about deploying with Amazon OpsWorks, see the *Amazon OpsWorks User Guide*.

Amazon Service Catalog deploy action reference

You use an Amazon Service Catalog action to deploy templates using your pipeline. These are resource templates that you have created in Service Catalog.

The CodePipeline action for Amazon Service Catalog is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

Action type

- Category: Deploy
- Owner: AWS
- Provider: ServiceCatalog
- Version: 1

Configuration parameters

TemplateFilePath

Required: Yes

The file path for your resource template in your source location.

ProductVersionName

Required: Yes

The product version in Service Catalog.

ProductType

Required: Yes

The product type in Service Catalog.

ProductId

Required: Yes

The product ID in Service Catalog.

ProductVersionDescription

Required: No

The product version description in Service Catalog.

Input artifacts

- Number of artifacts: 1
- Description: This is the input artifact for your action.

Output artifacts

- Number of artifacts: Ø
- **Description:** Output artifacts do not apply for this action type.

Service role permissions: Service Catalog action

For Service Catalog support, add the following to your policy statement:

```
{
    "Effect": "Allow",
    "Action": [
        "servicecatalog:ListProvisioningArtifacts",
        "servicecatalog:CreateProvisioningArtifact",
        "servicecatalog:DeleteProvisioningArtifact",
        "servicecatalog:DeleteProvisioningArtifact",
        "servicecatalog:UpdateProduct"
    ],
    "Resource": "resource_ARN"
},
{
```

```
"Effect": "Allow",
"Action": [
    "cloudformation:ValidateTemplate"
],
"Resource": "resource_ARN"
}
```

Example action configurations by type of configuration file

The following example shows a valid configuration for a deploy action that uses Service Catalog, for a pipeline that was created in the console without a separate configuration file:

```
"configuration": {
    "TemplateFilePath": "S3_template.json",
    "ProductVersionName": "devops S3 v2",
    "ProductType": "CLOUD_FORMATION_TEMPLATE",
    "ProductVersionDescription": "Product version description",
    "ProductId": "prod-example123456"
}
```

The following example shows a valid configuration for a deploy action that uses Service Catalog, for a pipeline that was created in the console with a separate sample_config.json configuration file:

```
"configuration": {
   "ConfigurationFilePath": "sample_config.json",
   "ProductId": "prod-example123456"
}
```

Example action configuration

YAML

```
Name: ActionName
ActionTypeId:
  Category: Deploy
  Owner: AWS
  Version: 1
  Provider: ServiceCatalog
OutputArtifacts:
```

```
    Name: myOutputArtifact
    Configuration:

            TemplateFilePath: S3_template.json
            ProductVersionName: devops S3 v2
            ProductType: CLOUD_FORMATION_TEMPLATE
            ProductVersionDescription: Product version description
            ProductId: prod-example123456
```

JSON

```
{
    "Name": "ActionName",
    "ActionTypeId": {
        "Category": "Deploy",
        "Owner": "AWS",
        "Version": 1,
        "Provider": "ServiceCatalog"
    },
    "OutputArtifacts": [
        {
            "Name": "myOutputArtifact"
        }
    ],
    "Configuration": {
        "TemplateFilePath": "S3_template.json",
        "ProductVersionName": "devops S3 v2",
        "ProductType": "CLOUD_FORMATION_TEMPLATE",
        "ProductVersionDescription": "Product version description",
        "ProductId": "prod-example123456"
    }
}
```

See also

The following related resources can help you as you work with this action.

- <u>Service Catalog User Guide</u> For information about resources and templates in Service Catalog, see the Service Catalog User Guide.
- <u>Tutorial: Create a pipeline that deploys to Service Catalog</u> This tutorial tutorial shows you
 how to create and configure a pipeline to deploy your product template to Service Catalog and
 deliver changes you have made in your source repository.

Amazon Step Functions invoke action reference

An Amazon CodePipeline action that does the following:

- Starts an Amazon Step Functions state machine execution from your pipeline.
- Provides an initial state to the state machine through either a property in the action configuration or a file located in a pipeline artifact to be passed as input.
- Optionally sets an execution ID prefix for identifying executions originating from the action.
- Supports Standard and Express state machines.

Note

The Step Functions action runs on Lambda, and it therefore has artifact size quotas that are the same as the artifact size quotas for Lambda functions. For more information, see Lambda quotas in the Lambda Developer Guide.

The CodePipeline action for Step Functions is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations with</u> CodePipeline.

Action type

- Category: Invoke
- Owner: AWS
- Provider: StepFunctions
- Version: 1

Configuration parameters

StateMachineArn

Required: Yes

The Amazon Resource Name (ARN) for the state machine to be invoked.

ExecutionNamePrefix

Required: No

By default, the action execution ID is used as the state machine execution name. If a prefix is provided, it is prepended to the action execution ID with a hyphen and together used as the state machine execution name.

myPrefix-1624a1d1-3699-43f0-8e1e-6bafd7fde791

For an express state machine, the name should only contain 0-9, A-Z, a-z, - and _.

InputType

Required: No

• Literal (default): When specified, the value in the **Input** field is passed directly to the state machine input.

Example entry for the **Input** field when **Literal** is selected:

{"action": "test"}

 FilePath: The contents of a file in the input artifact specified by the Input field is used as the input for the state machine execution. An input artifact is required when InputType is set to FilePath.

Example entry for the Input field when FilePath is selected:

assets/input.json

Input

Required: Conditional

• Literal: When InputType is set to Literal (default), this field is optional.

If provided, the **Input** field is used directly as the input for the state machine execution. Otherwise, the state machine is invoked with an empty JSON object {}.

• FilePath: When InputType is set to FilePath, this field is required.

An input artifact is also required when InputType is set to FilePath.

The contents of the file in the input artifact specified are used as the input for the state machine execution.

Input artifacts

- Number of artifacts: 0 to 1
- **Description:** If **InputType** is set to **FilePath**, this artifact is required and is used to source the input for the state machine execution.

Output artifacts

- Number of artifacts: 0 to 1
- Description:
 - Standard State Machines: If provided, the output artifact is populated with the output of the state machine. This is obtained from the output property of the <u>Step Functions</u> <u>DescribeExecution API</u> response after the state machine execution completes successfully.
 - Express State Machines: Not supported.

Output variables

This action produces output variables that can be referenced by the action configuration of a downstream action in the pipeline.

For more information, see <u>Variables reference</u>.

StateMachineArn

The ARN of the state machine.

ExecutionArn

The ARN of the execution of the state machine. Standard state machines only.

Service role permissions: StepFunctions action

For the StepFunctions action, the following are the minimum permissions needed to create pipelines with a Step Functions invoke action.

```
{
    "Effect": "Allow",
    "Action": [
        "states:DescribeStateMachine",
        "states:DescribeExecution",
        "states:StartExecution"
    ],
    "Resource": "resource_ARN"
},
```

Example action configuration

Example for default input

YAML

```
Name: ActionName
ActionTypeId:
Category: Invoke
Owner: AWS
Version: 1
Provider: StepFunctions
OutputArtifacts:
- Name: myOutputArtifact
Configuration:
StateMachineArn: arn:aws:states:us-east-1:11122223333:stateMachine:HelloWorld-
StateMachine
ExecutionNamePrefix: my-prefix
```

JSON

{

```
"Name": "ActionName",
"ActionTypeId": {
"Category": "Invoke",
"Owner": "AWS",
```

Example for literal input

YAML

```
Name: ActionName
ActionTypeId:
   Category: Invoke
   Owner: AWS
   Version: 1
   Provider: StepFunctions
OutputArtifacts:
        - Name: myOutputArtifact
Configuration:
   StateMachineArn: arn:aws:states:us-east-1:11122223333:stateMachine:HelloWorld-
StateMachine
   ExecutionNamePrefix: my-prefix
   Input: '{"action": "test"}'
```

JSON

```
{
    "Name": "ActionName",
    "ActionTypeId": {
        "Category": "Invoke",
        "Owner": "AWS",
        "Version": 1,
        "Provider": "StepFunctions"
```

```
},
  "OutputArtifacts": [
      {
         "Name": "myOutputArtifact"
      }
    ],
    "Configuration": {
         "StateMachineArn": "arn:aws:states:us-
east-1:111122223333:stateMachine:HelloWorld-StateMachine",
         "ExecutionNamePrefix": "my-prefix",
         "Input": "{\"action\": \"test\"}"
    }
}
```

Example for input file

YAML

```
Name: ActionName
InputArtifacts:
  - Name: myInputArtifact
ActionTypeId:
  Category: Invoke
  Owner: AWS
  Version: 1
  Provider: StepFunctions
OutputArtifacts:
  - Name: myOutputArtifact
Configuration:
  StateMachineArn: 'arn:aws:states:us-east-1:111122223333:stateMachine:HelloWorld-
StateMachine'
  ExecutionNamePrefix: my-prefix
  InputType: FilePath
  Input: assets/input.json
```

```
JSON
```

```
{
    "Name": "ActionName",
    "InputArtifacts": [
        {
            "Name": "myInputArtifact"
            "Name": "myInputArtifact"
```

```
}
    ],
    "ActionTypeId": {
        "Category": "Invoke",
        "Owner": "AWS",
        "Version": 1,
        "Provider": "StepFunctions"
    },
    "OutputArtifacts": [
        {
            "Name": "myOutputArtifact"
        }
    ],
    "Configuration": {
        "StateMachineArn": "arn:aws:states:us-
east-1:111122223333:stateMachine:HelloWorld-StateMachine",
        "ExecutionNamePrefix": "my-prefix",
        "InputType": "FilePath",
        "Input": "assets/input.json"
    }
}
```

Behavior

During a release, CodePipeline executes the configured state machine using the input as specified in the action configuration.

When **InputType** is set to **Literal**, the content of the **Input** action configuration field is used as the input for the state machine. When literal input is not provided, the state machine execution uses an empty JSON object {}. For more information about running a state machine execution without input, see the Step Functions StartExecution API.

When **InputType** is set to **FilePath**, the action unzips the input artifact and uses the content of the file specified in the **Input** action configuration field as the input for the state machine. When **FilePath** is specified, the **Input** field is required and an input artifact must exist; otherwise, the action fails.

After a successful start execution, behavior will diverge for the two state machine types, *standard* and *express*.

If the standard state machine execution was successfully started, CodePipeline polls the DescribeExecution API until the execution reaches a terminal status. If the execution completes successfully, the action succeeds; otherwise, it fails.

If an output artifact is configured, the artifact will contain the return value of the state machine. This is obtained from the output property of the <u>Step Functions DescribeExecution API</u> response after the state machine execution completes successfully. Note that there are output length constraints enforced on this API.

Error handling

- If the action fails to start a state machine execution, the action execution fails.
- If the state machine execution fails to reach a terminal status before the CodePipeline Step Functions action reaches its timeout (default of 7 days), the action execution fails. The state machine might continue despite this failure. For more information about state machine execution timeouts in Step Functions, see <u>Standard vs. Express Workflows</u>.

🚯 Note

You can request a quota increase for the invoke action timeout for the account with the action. However, the quota increase applies to all actions of this type in all Regions for that account.

• If the state machine execution reaches a terminal status of FAILED, TIMED_OUT, or ABORTED, the action execution fails.

Express state machines

If the express state machine execution was successfully started, the invoke action execution completes successfully.

Considerations for actions configured for express state machines:

- You cannot designate an output artifact.
- The action does not wait for the state machine execution to complete.
- After the action execution is started in CodePipeline, the action execution succeeds even if the state machine execution fails.

Error handling

• If CodePipeline fails to start a state machine execution, the action execution fails. Otherwise, the action succeeds immediately. The action succeeds in CodePipeline regardless of how long the state machine execution takes to complete or its outcome.

See also

The following related resources can help you as you work with this action.

- <u>Amazon Step Functions Developer Guide</u> For information about state machines, executions, and inputs for state machines, see the *Amazon Step Functions Developer Guide*.
- <u>Tutorial: Use an Amazon Step Functions invoke action in a pipeline</u> This tutorial gets you started with a sample standard state machine and shows you how to use the console to update a pipeline by adding a Step Functions invoke action.

Rule structure reference

This section is a reference for rule configuration only. For a conceptual overview of the pipeline structure, see CodePipeline pipeline structure reference.

Each rule provider in CodePipeline uses a set of required and optional configuration fields in the pipeline structure. This section provides the following reference information by rule provider:

- Valid values for the RuleType fields included in the pipeline structure rule block, such as Owner and Provider.
- Descriptions and other reference information for the Configuration parameters (required and optional) included in the pipeline structure rule section.
- Valid example JSON and YAML rule configuration fields.

Reference information is available for the following rule providers:

Topics

- CloudWatchAlarm
- CodeBuild rule
- Commands
- DeploymentWindow
- Lambdalnvoke
- VariableCheck

CloudWatchAlarm

When you create a condition, you can add the CloudWatchAlarm rule. This section provides a reference for the rule parameters. For more information about rules and conditions, see <u>How do</u> stage conditions work?.

You must have already created an alarm in Amazon CloudWatch as a separate resource.

Topics

- Rule type
- <u>Configuration parameters</u>

- Example rule configuration
- See also

Rule type

- Category: Rule
- Owner: AWS
- Provider: CloudWatchAlarm
- Version: 1

Configuration parameters

AlarmName

Required: Yes

The name of the CloudWatch alarm. This is a separate resource created in CloudWatch.

AlarmStates

Required: No

The desired CloudWatch alarm states for the rule to monitor. Valid values are ALARM, OK, and INSUFFICIENT_DATA.

WaitTime

Required: No

The wait time in minutes to allow for a state change before running the rule result. For example, configure 20 minutes to wait for an alarm state to change to OK before applying the rule result.

Example rule configuration

YAML

rules:

```
- name: MyMonitorRule
ruleTypeId:
   category: Rule
   owner: AWS
   provider: CloudWatchAlarm
   version: '1'
configuration:
   AlarmName: CWAlarm
   WaitTime: '1'
inputArtifacts: []
   region: us-east-1
```

JSON

```
"rules": [
        {
            "name": "MyMonitorRule",
            "ruleTypeId": {
                 "category": "Rule",
                 "owner": "AWS",
                 "provider": "CloudWatchAlarm",
                 "version": "1"
            },
            "configuration": {
                 "AlarmName": "CWAlarm",
                 "WaitTime": "1"
            },
            "inputArtifacts": [],
            "region": "us-east-1"
        }
    ]
}
```

See also

The following related resources can help you as you work with this rule.

• <u>Creating On Failure conditions</u> – This section provides steps for creating an On Failure condition with an alarm rule.

CodeBuild rule

When you create a condition, you can add the CodeBuild rule. This section provides a reference for the rule parameters. For more information about rules and conditions, see <u>How do stage conditions</u> <u>work?</u>.

You can use the CodeBuild rule to create a condition where the succesful run of your build project meets the rule criteria, such as the build run being successful for a beforeEntry condition.

i Note

For beforeEntry conditions that are configured with the **Skip** result, only the following rules are available: LambdaInvoke and VariableCheck.

Topics

- <u>Service role policy permissions</u>
- <u>Rule type</u>
- <u>Configuration parameters</u>
- Example rule configuration
- See also

Service role policy permissions

For permissions for this rule, add the following to your CodePipeline service role policy statement. Scope down permissions to the resource level.

```
{
    "Effect": "Allow",
    "Action": [
        "codebuild:BatchGetBuilds",
        "codebuild:StartBuild"
    ],
    "Resource": "resource_ARN"
},
```

Rule type

- Category: Rule
- Owner: AWS
- Provider: CodeBuild
- Version: 1

Configuration parameters

ProjectName

Required: Yes

ProjectName is the name of the build project in CodeBuild.

PrimarySource

Required: Conditional

The value of the PrimarySource parameter must be the name of one of the input artifacts to the action. CodeBuild looks for the buildspec file and runs the buildspec commands in the directory that contains the unzipped version of this artifact.

This parameter is required if multiple input artifacts are specified for a CodeBuild action. When there is only one source artifact for the action, the PrimarySource artifact defaults to that artifact.

BatchEnabled

Required: No

The Boolean value of the BatchEnabled parameter allows the action to run multiple builds in the same build execution.

When this option is enabled, the CombineArtifacts option is available.

For pipeline examples with batch builds enabled, see <u>CodePipeline integration with CodeBuild</u> and batch builds.

CombineArtifacts

Required: No

The Boolean value of the CombineArtifacts parameter combines all build artifacts from a batch build into a single artifact file for the build action.

To use this option, the BatchEnabled parameter must be enabled.

EnvironmentVariables

Required: No

The value of this parameter is used to set environment variables for the CodeBuild action in your pipeline. The value for the EnvironmentVariables parameter takes the form of a JSON array of environment variable objects. See the example parameter in <u>Action declaration</u> (CodeBuild example).

Each object has three parts, all of which are strings:

- name: The name or key of the environment variable.
- value: The value of the environment variable. When using the PARAMETER_STORE or SECRETS_MANAGER type, this value must be the name of a parameter you have already stored in Amazon Systems Manager Parameter Store or a secret you have already stored in Amazon Secrets Manager, respectively.

🚯 Note

We strongly discourage the use of environment variables to store sensitive values, especially Amazon credentials. When you use the CodeBuild console or Amazon CLI, environment variables are displayed in plain text. For sensitive values, we recommend that you use the SECRETS_MANAGER type instead.

• type: (Optional) The type of environment variable. Valid values are PARAMETER_STORE, SECRETS_MANAGER, or PLAINTEXT. When not specified, this defaults to PLAINTEXT.

i Note

When you enter the name, value, and type for your environment variables configuration, especially if the environment variable contains CodePipeline output variable syntax, do not exceed the 1000-character limit for the configuration's value field. A validation error is returned when this limit is exceeded.

For more information, see <u>EnvironmentVariable</u> in the Amazon CodeBuild API Reference. For an example CodeBuild action with an environment variable that resolves to the GitHub branch name, see Example: Use a BranchName variable with CodeBuild environment variables.

Example rule configuration

YAML

```
name: codebuild-rule
ruleTypeId:
  category: Rule
  owner: AWS
  provider: CodeBuild
  version: '1'
configuration:
   ProjectName: my-buildproject
   EnvironmentVariables: '[{"name":"VAR1","value":"variable","type":"PLAINTEXT"}]'
inputArtifacts:
   - name: SourceArtifact
region: us-east-1
```

JSON

```
{
    "name": "codebuild-rule",
    "ruleTypeId": {
        "category": "Rule",
        "owner": "AWS",
        "provider": "CodeBuild",
        "version": "1"
    },
    "configuration": {
        "ProjectName": "my-buildproject"
    },
    "inputArtifacts": [
        {
            "name": "SourceArtifact",
            "EnvironmentVariables": "[{\"name\":\"VAR1\",\"value\":\"variable\",
\"type\":\"PLAINTEXT\"}]"
        }
    ],
    "region": "us-east-1"
```

}

See also

The following related resources can help you as you work with this rule.

• For more information about rules and conditions, see <u>Condition</u>, <u>RuleTypeId</u>, and <u>RuleExecution</u> in the *CodePipeline API Guide*.

Commands

When you create a condition, you can add the Commands rule. This section provides a reference for the rule parameters. For more information about rules and conditions, see <u>How do stage conditions</u> <u>work?</u>.

You can use the Commands rule to create a condition where the succesful commands meet the rule criteria, such as the output and file path for the commands being successful for a beforeEntry condition.

🚯 Note

For beforeEntry conditions that are configured with the **Skip** result, only the following rules are available: LambdaInvoke and VariableCheck.

Topics

- Considerations for the Commands rule
- Service role policy permissions
- Rule type
- <u>Configuration parameters</u>
- Example rule configuration
- See also

Considerations for the Commands rule

The following considerations apply for the Commands rule.

 The commands rule uses CodeBuild resources similar to the CodeBuild action, while allowing shell environment commands in a virtual compute instance without the need to associate or create a build project.

Note

Running the commands rule will incur separate charges in Amazon CodeBuild.

- Because the Commands rule in CodePipeline uses CodeBuild resources, the builds run by the action will be attributed to the build limits for your account in CodeBuild. Builds run by the Commands rule will count toward the concurrent build limits as configured for that account.
- The timeout for builds with the Commands rule is 55 minutes, as based on CodeBuild builds.
- The compute instance uses an isolated build environment in CodeBuild.

i Note

Because the isolated build environment is used at the account level, an instance might be reused for another pipeline execution.

- All formats are supported except multi-line formats. You must use single-line format when entering commands.
- For this rule, CodePipeline will assume the pipeline service role and use that role to allow access to resources at runtime. It is recommended to configure the service role so that the permissions are scoped down to the action level.
- The permissions added to the CodePipeline service role are detailed in <u>Add permissions to the</u> <u>CodePipeline service role</u>.
- The permission needed to view logs in the console is detailed in <u>Permissions required to view</u> <u>compute logs in the CodePipeline console</u>. In the following example screens, use the Logs link to view logs for a successful Commands rule in CloudWatch logs.

		ndition execution details ution ID: 9ace7b55-da5d-426d-8451-fe3e92b1c1e6					×
(Condition type: Be	foreEntry Result: FAIL	Status: 🔗 S	Succeeded			
L	Rule states	Rule Configuration					
	Name	Rule Execution ID				Status	Reason
	cmdsrule	05f51200-cf09-4d				Succeeded	Logs 🔽
	2024-11-04T15:4	7:07.928Z	[Container]	2024/11/04	15:47:07.469537	Entering phase BUILD	Done
	2024-11-04115:4					Running command echo	
	2024-11-04T15:4	7:07.928Z	hello world			-	
	2024-11-04T15:4	7:07.928Z					
	2024-11-04T15:4	7:07.928Z	[Container]	2024/11/04	15:47:07.522410	Phase complete: BUIL	D State: SUCCEE
	2024-11-04T15:4	7:07.928Z	[Container]	2024/11/04	15:47:07.522428	Phase context status	code: Message:
	2024-11-04T15:4	7:07.928Z	[Container]	2024/11/04	15:47:07.565724	Entering phase POST_	BUILD
	2024-11-04T15:4	7:07.928Z	[Container]	2024/11/04	15:47:07.566944	Phase complete: POST	_BUILD State: S

• Unlike other actions in CodePipeline, you do not set fields in the action configuration; you set the action configuration fields outside of the action configuration.

Service role policy permissions

When CodePipeline runs the rule, CodePipeline creates a log group using the name of the pipeline as follows. This enables you to scope down permissions to log resources using the pipeline name.

/aws/codepipeline/MyPipelineName

If you are using an existing service role, to use the Commands action, you will need to add the following permissions for the service role.

logs:CreateLogGroup

- logs:CreateLogStream
- logs:PutLogEvents

In the service role policy statement, scope down the permissions to the pipeline level as shown in the following example.

```
{
    "Effect": "Allow",
    "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
    ],
    "Resource": "arn:aws:logs:*:YOUR_AWS_ACCOUNT_ID:log-group:/aws/
codepipeline/YOUR_PIPELINE_NAME:*"
}
```

To view logs in the console using the action details dialog page, the permission to view logs must be added to the console role. For more information, see the console permissions policy example in Permissions required to view compute logs in the CodePipeline console.

Rule type

- Category: Rule
- Owner: AWS
- Provider: Commands
- Version: 1

Configuration parameters

Commands

Required: Yes

You can provide shell commands for the Commands rule to run. In the console, commands are entered on separate lines. In the CLI, commands are entered as separate strings.

í) Note

Multi-line formats are not supported and will result in an error message. Single-line format must be used for entering commands in the **Commands** field.

The following details provide the default compute that is used for the Commands rule. For more information, see <u>Build environment compute modes and types</u> reference in the CodeBuild User Guide.

- CodeBuild image: aws/codebuild/amazonlinux2-x86_64-standard:5.0
- Compute type: Linux Small
- Environment computeType value: BUILD_GENERAL1_SMALL
- Environment type value: LINUX_CONTAINER

Example rule configuration

```
YAML
```

```
result: FAIL
rules:
- name: CommandsRule
ruleTypeId:
    category: Rule
    owner: AWS
    provider: Commands
    version: '1'
configuration: {}
commands:
- ls
- printenv
inputArtifacts:
- name: SourceArtifact
region: us-east-1
```

JSON

```
{
    "result": "FAIL",
    "rules": [
```

```
{
             "name": "CommandsRule",
            "ruleTypeId": {
                 "category": "Rule",
                 "owner": "AWS",
                 "provider": "Commands",
                 "version": "1"
            },
            "configuration": {},
            "commands": [
                 "ls",
                 "printenv"
            ],
            "inputArtifacts": [
                 {
                     "name": "SourceArtifact"
                 }
            ],
            "region": "us-east-1"
        }
    ]
}
```

See also

The following related resources can help you as you work with this rule.

• For more information about rules and conditions, see <u>Condition</u>, <u>RuleTypeId</u>, and <u>RuleExecution</u> in the *CodePipeline API Guide*.

DeploymentWindow

When you create a condition, you can add the DeploymentWindow rule. This section provides a reference for the rule parameters. For more information about rules and conditions, see <u>How do</u> <u>stage conditions work?</u>.

Topics

- Rule type
- <u>Configuration parameters</u>

- Example rule configuration
- See also

Rule type

- Category: Rule
- Owner: AWS
- Provider: DeploymentWindow
- Version: 1

Configuration parameters

Cron

Required: Yes

The expression that defines the days and times when the deployment will be allowed. Cron expressions are comprised of 6 required fields and one optional field separated by white space. The cron expression fields allow you to specify a schedule pattern with a cron expression as follows.

Field name	Allowed values	Allowed special characters
Seconds	N/A	*
Minutes	0-59	, - * /
Hours	0-23	, - * /
Day-of-month	1-31	, - * ? / L W
Month	1-12 or JAN-DEC	, - * /
Day-of-Week	1-7 or SUN-SAT	,-*?/L#
Year (Optional)	empty, 1970-2199	, - * /

- The '?' character is allowed for the day-of-month and day-of-week fields. It is used to specify 'no specific value'. This is useful when you need to specify something in one of the two fields, but not the other.
- The '-' character is used to specify ranges For example "10-12" in the hour field means "the hours 10, 11 and 12".
- The ',' character is used to specify additional values. For example "MON,WED,FRI" in the dayof-week field means "the days Monday, Wednesday, and Friday".
- The '/' character is used to specify increments. For example "0/15" in the seconds field means "the seconds 0, 15, 30, and 45". And "5/15" in the seconds field means "the seconds 5, 20, 35, and 50". Specifying '*' before the '/' is equivalent to specifying 0 is the value to start with.
- The 'L' character is allowed for the day-of-month and day-of-week fields. This character is short-hand for "last", but it has different meaning in each of the two fields. For example, the value "L" in the day-of-month field means "the last day of the month" day 31 for January, day 28 for February on non-leap years. If used in the day-of-week field by itself, it simply means "7" or "SAT". But if used in the day-of-week field after another value, it means "the last <specified_day> day of the month" for example "6L" means "the last friday of the month". You can also specify an offset from the last day of the month, such as "L-3" which would mean the third-to-last day of the calendar month.
- The 'W' character is allowed for the day-of-month field. This character is used to specify the weekday (Monday-Friday) nearest the given day. As an example, if you were to specify "15W" as the value for the day-of-month field, the meaning is: "the nearest weekday to the 15th of the month". So if the 15th is a Saturday, the trigger will fire on Friday the 14th. If the 15th is a Sunday, the trigger will fire on Monday the 16th. If the 15th is a Tuesday, then it will fire on Tuesday the 15th.
- The 'L' and 'W' characters can also be combined for the day-of-month expression to yield 'LW', which translates to "last weekday of the month".
- The '#' character is allowed for the day-of-week field. This character is used to specify "the nth" <specified_day> day of the month. For example, the value of "6#3" in the day-of-week field means the third Friday of the month (day 6 = Friday and "#3" = the 3rd one in the month).
- The legal characters and the names of months and days of the week are not case sensitive.

TimeZone

Required: No

The time zone for the deployment window. The regular expression matches patterns in the following formats:

- Region/City format. The value matches a time zone in the format Region/City or Region/ City_City. For example, America/New_York or Europe/Berlin.
- **UTC format**. The value matches the string UTC optionally followed by an offset in the format +HH:MM or -HH:MM. For example, UTC, UTC+05:30, or UTC-03:00. This is the default format if the parameter is not set otherwise.
- Abbreviation format. The value matches a 3 to 5 character abbreviation for a time zone. For example, EST or IST.

For a table of valid TimeZoneID values, see <u>https://docs.oracle.com/middleware/1221/wcs/</u> <u>tag-ref/MISC/TimeZones.html</u>. Note that certain abbreviations are duplicated abbreviations, such as CST for Central Standard Time, China Standard Time, and Cuba Standard Time.

Example rule configuration

YAML

```
- name: MyDeploymentRule
ruleTypeId:
    category: Rule
    owner: AWS
    provider: DeploymentWindow
    version: '1'
configuration:
    Cron: 0 0 9-17 ? * MON-FRI *
    TimeZone: PST
    inputArtifacts: []
    region: us-east-1
```

JSON

[{ "name": "MyDeploymentRule",



See also

The following related resources can help you as you work with this rule.

- <u>Creating On Success conditions</u> This section provides steps for creating an On Success condition with a deployment window rule.
- For more information about rules and conditions, see <u>Condition</u>, <u>RuleTypeId</u>, and <u>RuleExecution</u> in the *CodePipeline API Guide*.

LambdaInvoke

When you create a condition, you can add the LambdaInvoke rule. This section provides a reference for the rule parameters. For more information about rules and conditions, see <u>How do</u> stage conditions work?.

You must have already created a function in Lambda as a separate resource.

Topics

- Rule type
- <u>Configuration parameters</u>
- Example rule configuration
- See also

Rule type

- Category: Rule
- Owner: AWS
- Provider: LambdaInvoke
- Version: 1

Configuration parameters

FunctionName

Required: Yes

The name of the Lambda function.

UserParameters

Required: No

These are parameters that are provided as input for the function in key-value pair format.

Example rule configuration

YAML

```
- name: MyLambdaRule
ruleTypeId:
   category: Rule
   owner: AWS
   provider: LambdaInvoke
   version: '1'
configuration:
   FunctionName: my-function
inputArtifacts:
   - name: SourceArtifact
region: us-east-1
```

JSON

E

```
{
        "name": "MyLambdaRule",
        "ruleTypeId": {
            "category": "Rule",
            "owner": "AWS",
            "provider": "LambdaInvoke",
            "version": "1"
        },
        "configuration": {
            "FunctionName": "my-function"
        },
        "inputArtifacts": [
            {
                 "name": "SourceArtifact"
            }
        ],
        "region": "us-east-1"
    }
]
```

See also

The following related resources can help you as you work with this rule.

 <u>Creating On Failure conditions</u> – This section provides steps for creating an On Failure condition with an alarm rule.

VariableCheck

When you create a condition, you can add the VariableCheck rule. This section provides a reference for the rule parameters. For more information about rules and conditions, see <u>How do</u> <u>stage conditions work?</u>.

You can use the VariableCheck rule to create a condition where the output variable is checked against a provided expression. The rule passes the check when the variable value meets the rule criteria, such as the value being equal or greater than a specified output variable.

Topics

Rule type

- Configuration parameters
- Example rule configuration
- See also

Rule type

- Category: Rule
- Owner: AWS
- Provider: VariableCheck
- Version: 1

Configuration parameters

Operator

Required: Yes

The operator that indicates which operation to perform for the variable check.

In the following example, the output variable for the repository name will be checked for whether it is equal to MyDemoRepo.

```
"configuration": {
    "Variable": "#{SourceVariables.RepositoryName}",
    "Value": "MyDemoRepo",
    "Operator": "EQ"
},
```

The following operators are available to create an expression as follows.

• Equals - Choose this operator to check whether the variable is equal to the string value.

CLI parameter: EQ

• **Contains** - Choose this operator to check whether the variable contains the string value as a substring.

CLI parameter: CONTAINS

• **Matches** - Choose this operator to check whether the variable matches a given regex expression as the string value.

All regular expressions in CodePipeline conform to the Java regex syntax. For a comprehensive description of the Java regex syntax and its constructs, see java.util.regex.Pattern.

CLI parameter: MATCHES

• Not equals - Choose this operator to check whether the variable is not equal to the string value.

CLI parameter: NE

Variable

Required: Yes

The pipeline variables to check.

Value

Required: Yes

The value for the expression to check against.

In the following example, the output variable for the repository name will be checked for whether it is equal to MyDemoRepo.

```
"configuration": {
    "Variable": "#{SourceVariables.RepositoryName}",
    "Value": "MyDemoRepo",
    "Operator": "EQ"
},
```

In the following JSON example, two separate rules are defined, one for an EQ (equals) statement that checks the repository and branch name formatted as #{SourceVariables.RepositoryName} and one for CONTAINS that checks the commit message output variable formatted as #{SourceVariables.CommitMessage} against the provided value "update."

```
"beforeEntry": {
"conditions": [
{
```

```
"result": "FAIL",
                     "rules": [
                         {
                             "name": "MyVarCheckRule",
                             "ruleTypeId": {
                                 "category": "Rule",
                                 "owner": "AWS",
                                 "provider": "VariableCheck",
                                 "version": "1"
                             },
                             "configuration": {
                                 "Operator": "EQ",
                                 "Value": "MyDemoRepo",
                                 "Variable": "#{SourceVariables.RepositoryName}"
                             },
                             "inputArtifacts": [],
                             "region": "us-east-1"
                         },
                         {
                             "name": "MyVarCheckRuleContains",
                             "ruleTypeId": {
                                 "category": "Rule",
                                 "owner": "AWS",
                                 "provider": "VariableCheck",
                                 "version": "1"
                             },
                             "configuration": {
                                 "Operator": "CONTAINS",
                                 "Value": "update",
                                 "Variable": "#{SourceVariables.CommitMessage}"
                             },
                             "inputArtifacts": [],
                             "region": "us-east-1"
                         }
                     ]
                }
            ]
        }
    }
],
```

Example rule configuration

YAML

```
- name: MyVariableCheck
ruleTypeId:
    category: Rule
    owner: AWS
    provider: VariableCheck
    version: '1'
configuration:
    Variable: "#{SourceVariables.RepositoryName}"
    Value: MyDemoRepo
    Operator: EQ
inputArtifacts: []
region: us-west-2
```

JSON

```
"rules": [
    {
        "name": "MyVariableCheck",
        "ruleTypeId": {
            "category": "Rule",
            "owner": "AWS",
            "provider": "VariableCheck",
            "version": "1"
        },
        "configuration": {
            "Variable": "#{SourceVariables.RepositoryName}",
            "Value": "MyDemoRepo",
            "Operator": "EQ"
        },
        "inputArtifacts": [],
        "region": "us-west-2"
    }
]
```

See also

The following related resources can help you as you work with this rule.

- <u>Tutorial: Create a variable check rule for a pipeline as an entry condition</u> This section provides a tutorial with steps for creating an On Entry condition with a variable check rule.
- <u>Variables reference</u> This section provides reference information and examples for pipeline variables.
- For more information about rules and conditions, see <u>Condition</u>, <u>RuleTypeId</u>, and <u>RuleExecution</u> in the *CodePipeline API Guide*.

Integration model reference

There are several pre-built integrations for third-party services to help build existing customer tools into the pipeline release process. Partners, or third-party service providers, use an integration model to implement action types for use in CodePipeline.

Use this reference when you are planning or working with action types that are managed with a supported integration model in CodePipeline.

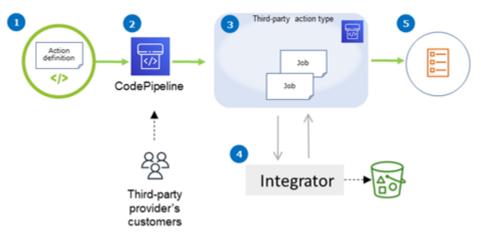
To certify your third-party action type as a partner integration with CodePipeline, reference the Amazon Partner Network (APN). This information is a supplement to the Amazon CLI Reference.

Topics

- How third-party action types work with the integrator
- Concepts
- <u>Supported integration models</u>
- Lambda integration model
- Job worker integration model

How third-party action types work with the integrator

You can add third-party action types to customer pipelines to complete tasks on customer resources. The integrator manages job requests and runs the action with CodePipeline. The following diagram shows a third-party action type created for customers to use in their pipeline. After the customer configures the action, the action runs and creates job requests that are handled by the integrator's action engine.



The diagram shows the following steps:

- 1. The action definition is registered and made available in CodePipeline. The third-party action is available for customers of the third-party provider.
- 2. The provider's customer chooses and configures the action in CodePipeline.
- 3. The action runs and jobs are queued in CodePipeline. When the job is ready in CodePipeline, it sends a job request.
- 4. The integrator (the job worker for third-party polling APIs or the Lambda function) picks up the job request, returns a confirmation, and works on the artifacts for the actions.
- 5. The integrator returns success/failure output (the job worker uses success/failure APIs or the Lambda function sends success/failure output) with a job result and a continuation token.

For information about the steps you can use to request, view, and update an action type, see <u>Working with action types</u>.

Concepts

This section uses the following terms for third-party action types:

Action type

A repeatable process that can be re-used in pipelines that performs the same continuous delivery workloads. Action types are identified by an Owner, Category, Provider, and Version. For example:

```
{
    "Category": "Deploy",
    "Owner": "AWS",
    "Provider": "CodeDeploy",
    "Version": "1"
},
```

All actions of the same type share the same implementation.

User Guide

Action

A single instance of an action type, one of the discrete processes that happens inside a stage of a pipeline. This typically includes the user values specific to the pipeline that this action runs in.

Action definition

The schema for an action type that defines the properties required to configure the action and input/output artifacts.

Action execution

A collection of jobs that have been run to determine whether the action on the customer's pipeline was successful or not.

Action execution engine

A property of the action execution configuration that defines the integration type used by an action type. Valid values are JobWorker and Lambda.

Integration

Describes a piece of software run by an integrator to implement an action type. CodePipeline supports two integration types corresponding to the two supported action engines JobWorker and Lambda.

Integrator

The person who owns the implementation of an action type.

Job

A piece of work with pipeline and customer context to execute an integration. An action execution is composed of one or more jobs.

Job worker

The service that processes the customer input and runs a job.

Supported integration models

CodePipeline has two integration models:

• Lambda integration model: This integration model is the preferred way to work with action types in CodePipeline. The Lambda integration model uses a Lambda function to process job requests when your action runs.

• Job worker integration model: The job worker integration model is the previously used model for third-party integrations. The job worker integration model uses a job worker configured to contact the CodePipeline APIs to process job requests when your action runs.

For comparison, the following table describes the features of the two models:

	Lambda integration model	Job worker integration model
Description	The integrator writes the integrati on as a Lambda function, which is invoked by CodePipel ine whenever there is a job available for the action. The Lambda function does not poll for available jobs but instead waits until the next job request is received.	The integrator writes the integration as a job worker that polls constantly for available jobs on the customer's pipelines . The job worker then executes the job and submits the job result back to CodePipeline by using CodePipeline APIs.
Infrastructure	Amazon Lambda	Deploy job worker code to integrator's infrastructure, like Amazon EC2 instances.
Development effort	The integration only contains the business logic.	The integration needs to interact with CodePipeline APIs in addition to containing the business logic.
Ops effort	Lesser ops effort since infrastru cture is only Amazon resources.	Higher ops effort because the job worker needs its standalone hardware.
Max Job Run Time	If the integration needs to actively run for more than 15 minutes, this model cannot be used. This action is for integrato rs who need to start a process (for example, initiate a build on customer's code artifact) and	Very long running jobs (hours/ days) can be sustained using this model.

Lambda integration model	Job worker integration model
return a result when it finishes. We do not recommend that the integrator continue waiting on the build to finish. Instead, return a <i>continuation</i> . CodePipeline creates a new job in another 30 seconds if a continuation is received from the integrator's code to check on the job until it finishes.	

Lambda integration model

The supported Lambda integration model includes creating the Lambda function and defining output for the third-party action type.

Update your Lambda function to handle the input from CodePipeline

You can create a new Lambda function. You can add business logic to your Lambda function that is run whenever there's a job available on your pipeline for your action type. For instance, given the context of the customer and pipeline, you might want to start a build in your service for the customer.

Use the following parameters to update your Lambda function to handle the input from CodePipeline.

Format:

- jobId:
 - The unique system-generated ID of the job.
 - Type: String
 - Pattern: [0-9a-f]{8}-[0-9a-f]{4}-[0-9a-f]{4}-[0-9a-f]{12}
- accountId:
 - The ID of the customer's Amazon account to use when performing the job.
 - Type: String

- Pattern: [0-9]{12}
- data:
 - Other information about a job that an integration uses to complete the job.
 - Contains a map of the following:
 - actionConfiguration:
 - The configuration data for the action. The action configuration fields are a mapping
 of key-value pairs for your customer to enter values. The keys are determined by the
 key parameters in the action type definition file when you set up your action. In this
 example, the values are determined by the user of the action specifying information in the
 Username and Password fields.
 - Type: String to string map, optionally present

Example:

```
"configuration": {
    "Username": "MyUser",
    "Password": "MyPassword"
},
```

- encryptionKey:
 - Represents information about the key used to encrypt data in the artifact store, such as an Amazon KMS key.
 - Contents: Type of the data type encryptionKey, optionally present
- inputArtifacts:
 - List of information about an artifact to be worked on, such as a test or build artifact.
 - Contents: List of the data type Artifact, optionally present
- outputArtifacts:
 - List of information about the output of an action.
 - Contents: List of the data type Artifact, optionally present
- actionCredentials:
 - Represents an Amazon session credentials object. These credentials are temporary credentials that are issued by Amazon STS. They can be used to access input and output

These credentials also have the same permissions as the specified policy statements template in the action type definition file.

- Contents: Type of the data type AWSSessionCredentials, optionally present
- actionExecutionId:
 - The external ID of the run of the action.
 - Type: String
- continuationToken:
 - A system-generated token, such as a deployment ID, required by a job to continue the job asynchronously.
 - Type: String, optionally present

Data Types:

- encryptionKey:
 - id:
 - The ID used to identify the key. For an Amazon KMS key, you can use the key ID, the key ARN, or the alias ARN.
 - Type: String
 - type:
 - The type of encryption key, such as an Amazon KMS key.
 - Type: String
 - Valid values: KMS
- Artifact:
 - name:
 - The artifact's name.
 - Type: String, optionally present
 - revision:
 - The artifact's revision ID. Depending on the type of object, this could be a commit ID (GitHub) or a revision ID (Amazon S3).
 - Type: String, optionally present

- The location of an artifact.
- Contents: Type of the data type ArtifactLocation, optionally present
- ArtifactLocation:
 - type:
 - The type of artifact in the location.
 - Type: String, optionally present
 - Valid values: S3
 - s3Location:
 - The location of the S3 bucket that contains a revision.
 - Contents: Type of the data type S3Location, optionally present
- S3Location:
 - bucketName:
 - The name of the S3 bucket.
 - Type: String
 - objectKey:
 - The key of the object in the S3 bucket, which uniquely identifies the object in the bucket.
 - Type: String
- AWSSessionCredentials:
 - accessKeyId:
 - The access key for the session.
 - Type: String
 - secretAccessKey:
 - The secret access key for the session.
 - Type: String
 - sessionToken:
 - The token for the session.
 - Type: String

Example:

```
"jobId": "01234567-abcd-abcd-abcd-012345678910",
"accountId": "012345678910",
"data": {
    "actionConfiguration": {
        "key1": "value1",
        "key2": "value2"
    },
    "encryptionKey": {
        "id": "123-abc",
        "type": "KMS"
    },
    "inputArtifacts": [
        {
            "name": "input-art-name",
            "location": {
                "type": "$3",
                "s3Location": {
                    "bucketName": "inputBucket",
                    "objectKey": "inputKey"
                }
            }
        }
    ],
    "outputArtifacts": [
        {
            "name": "output-art-name",
            "location": {
                "type": "$3",
                "s3Location": {
                    "bucketName": "outputBucket",
                    "objectKey": "outputKey"
                }
            }
        }
    ],
    "actionExecutionId": "actionExecutionId",
    "actionCredentials": {
        "accessKeyId": "access-id",
        "secretAccessKey": "secret-id",
        "sessionToken": "session-id"
    },
    "continuationToken": "continueId-xxyyzz"
}
```

Return the results from your Lambda function to CodePipeline

The integrator's job worker resource must return a valid payload in success, failure, or continuation cases.

Format:

- result: The result of the job.
 - Required
 - Valid values (case insensitive):
 - Success: Indicates a job is successful and terminal.
 - Continue: Indicates a job is successful and must continue, for example if the job worker is reinvoked for the same action execution.
 - Fail: Indicates a job has failed and is terminal.
- failureType: A failure type to be associated with a failed job.

The failureType category for partner actions describes the type of failure that was encountered while running the job. Integrators set the type along with the failure message when returning a job failure result back to CodePipeline.

- Optional. Required if result is Fail.
- Must be null if result is Success or Continue
- Valid values:
 - ConfigurationError
 - JobFailed
 - PermissionsError
 - RevisionOutOfSync
 - RevisionUnavailable
 - SystemUnavailable
- continuation: Continuation state to be passed to the next job within the current action execution.
 - Optional. Required if result is Continue.
 - Must be null if result is Success or Fail.

- Properties:
 - State: A hash of the state to be passed.
- status: Status of the action execution.
 - Optional.
 - Properties:
 - ExternalExecutionId: An optional external execution ID or commit ID to associate with the job.
 - Summary: An optional summary of what occurred. In failure scenarios, this becomes the failure message that the user sees.
- outputVariables: A set of key/value pairs to be passed to the next action execution.
 - Optional.
 - Must be null if result is Continue or Fail.

Example:

```
{
    "result": "success",
    "failureType": null,
    "continuation": null,
    "status": {
        "externalExecutionId": "my-commit-id-123",
        "summary": "everything is dandy"
    },
    "outputVariables": {
        "FirstOne": "Nice",
        "SecondOne": "Nicest",
        ...
    }
}
```

Use continuation tokens to wait for results from an asynchronous process

The continuation token is part of the payload and result of your Lambda function. It is a way to pass job state to CodePipeline and indicate that the job needs to be continued. For example, after an integrator starts a build for the customer on their resource, it does not wait for the build

to complete, but indicates to CodePipeline that it does not havea terminal result by returning the result as continue and returning the build's unique ID to CodePipeline as continuation token.

1 Note

Lambda functions can only run up to 15 minutes. If the job needs to run longer, you can use continuation tokens.

The CodePipeline team invokes the integrator after 30 seconds with the same continuation token in its payload so that it can check on it for completion. If the build completes, the integrator returns terminal success/fail result, else continues.

Provide CodePipeline the permissions to invoke the integrator Lambda function at runtime

You add permissions to your integrator Lambda function to provide the CodePipeline service with permissions to invoke it using the CodePipeline service principal: codepipeline.amazonaws.com. You can add permissions by using Amazon CloudFormation or the command line. For an example, see <u>Working with action types</u>.

Job worker integration model

After you have designed your high-level workflow, you can create your job worker. Although the specifics of the third-party action determine what is needed for the job worker, most job workers for third-party actions include the following functionality:

- Polling for jobs from CodePipeline using PollForThirdPartyJobs.
- Acknowledging jobs and returning results to CodePipeline using AcknowledgeThirdPartyJob, PutThirdPartyJobSuccessResult, and PutThirdPartyJobFailureResult.
- Retrieving artifacts from and/or putting artifacts into the Amazon S3 bucket for the pipeline. To download artifacts from the Amazon S3 bucket, you must create an Amazon S3 client that uses Signature Version 4 signing (Sig V4). Sig V4 is required for Amazon KMS.

To upload artifacts to the Amazon S3 bucket, you must also configure the Amazon S3 <u>PutObject</u> request to use encryption through Amazon Key Management Service (Amazon KMS). Amazon KMS uses Amazon KMS keys. In order to know whether to use the Amazon managed key or a customer managed key to upload artifacts, your job worker must look at the <u>job data</u> and check the <u>encryption key</u> property. If the property is set, you should use that customer managed key ID when configuring Amazon KMS. If the key property is null, you use the Amazon managed key. CodePipeline uses the Amazon managed key unless otherwise configured.

For an example that shows how to create the Amazon KMS parameters in Java or .NET, see <u>Specifying the Amazon Key Management Service in Amazon S3 Using the Amazon SDKs</u>. For more information about the Amazon S3 bucket for CodePipeline, see <u>CodePipeline concepts</u>.

Choose and configure a permissions management strategy for your job worker

To develop a job worker for your third-party action in CodePipeline, you need a strategy for the integration of user and permission management.

The simplest strategy is to add the infrastructure you need for your job worker by creating Amazon EC2 instances with an Amazon Identity and Access Management (IAM) instance role, which allow you to easily scale up the resources you need for your integration. You can use the built-in integration with Amazon to simplify the interaction between your job worker and CodePipeline.

Learn more about Amazon EC2 and determine whether it is the right choice for your integration. For information, see <u>Amazon EC2 - Virtual Server Hosting</u>. For information about setting up an Amazon EC2 instance, see <u>Getting Started with Amazon EC2 Linux Instances</u>.

Another strategy to consider is using identity federation with IAM to integrate your existing identity provider system and resources. This strategy is useful if you already have a corporate identity provider or are already configured to support users using web identity providers. Identity federation allows you to grant secure access to Amazon resources, including CodePipeline, without having to create or manage IAM users. You can use features and policies for password security requirements and credential rotation. You can use sample applications as templates for your own design. For information, see Manage Federation.

To provide access, add permissions to your users, groups, or roles:

• Users managed in IAM through an identity provider:

Create a role for identity federation. Follow the instructions in <u>Create a role for a third-party</u> identity provider (federation) in the *IAM User Guide*.

- IAM users:
 - Create a role that your user can assume. Follow the instructions in <u>Create a role for an IAM user</u> in the *IAM User Guide*.
 - (Not recommended) Attach a policy directly to a user or add a user to a user group. Follow the instructions in Adding permissions to a user (console) in the *IAM User Guide*.

The following is an example policy you might create for use with your third-party job worker. This policy is meant as an example only and is provided as-is.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "codepipeline:PollForThirdPartyJobs",
        "codepipeline:AcknowledgeThirdPartyJob",
        "codepipeline:GetThirdPartyJobDetails",
        "codepipeline:PutThirdPartyJobSuccessResult",
        "codepipeline:PutThirdPartyJobFailureResult"
      ],
      "Resource": [
        "arn:aws:codepipeline:us-east-2::actionType:ThirdParty/Build/Provider/1/"
      ]
    }
  ]
}
```

Image definitions file reference

This section is a reference only. For information about creating a pipeline with source or deploy actions for containers, see <u>Create a pipeline, stages, and actions</u>.

Amazon CodePipeline job workers for container actions, such as an Amazon ECR source action or Amazon ECS deploy actions, use definitions files to map the image URI and container name to the task definition. Each definitions file is a JSON-formatted file used by the action provider as follows:

- Amazon ECS standard deployments require an imagedefinitions.json file as an input to the deploy action. For a tutorial that uses the Amazon ECS standard deployment action in CodePipeline, see <u>Tutorial: Amazon ECS Standard Deployment with CodePipeline</u>. For another example tutorial that uses the Amazon ECS standard deployment action in CodePipeline along with the ECRBuildAndPublish action, see <u>Tutorial: Build and push a Docker image to Amazon ECR</u> with CodePipeline (V2 type).
- Amazon ECS blue/green deployments require an imageDetail.json file as an input to the deploy action. For a tutorial with a sample blue/green deployment, see <u>Tutorial: Create a</u> pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment.
 - Amazon ECR source actions generate an imageDetail.json file that is provided as an output from the source action.

Topics

- imagedefinitions.json file for Amazon ECS standard deployment actions
- imageDetail.json file for Amazon ECS blue/green deployment actions

imagedefinitions.json file for Amazon ECS standard deployment actions

An image definitions document is a JSON file that describes your Amazon ECS container name and the image and tag. If you are deploying container-based applications, you must generate an image definitions file to provide the CodePipeline job worker with the Amazon ECS container and image identification to retrieve from the image repository, such as Amazon ECR.

(i) Note

The default file name for the file is imagedefinitions.json. If you choose to use a different file name, you must provide it when you create the pipeline deployment stage.

Create the imagedefinitions.json file with the following considerations:

- The file must use UTF-8 encoding.
- The maximum file size limit for the image definitions file is 100 KB.
- You must create the file as a source or build artifact so that it is an input artifact for the deploy action. In other words, make sure that the file is either uploaded to your source location, such as your CodeCommit repository, or generated as a built output artifact.

The imagedefinitions.json file provides the container name and image URI. It must be constructed with the following set of key-value pairs.

Кеу	Value
name	container_name
imageUri	imageUri

🚯 Note

The name field is used for the container image name, meaning the name for the Docker image.

Here is the JSON structure, where the container name is sample-app, the image URI is ecs-repo, and the tag is latest:

```
[
  {
    {
        "name": "sample-app",
        "imageUri": "11111EXAMPLE.dkr.ecr.us-west-2.amazonaws.com/ecs-repo:latest"
}
```

]

You can also construct the file to list multiple container-image pairs.

JSON structure:

```
[
    {
        "name": "simple-app",
        "imageUri": "httpd:2.4"
    },
    {
        "name": "simple-app-1",
        "imageUri": "mysql"
    },
    {
        "name": "simple-app-2",
        "imageUri": "java1.8"
    }
]
```

Before you create your pipeline, use the following steps to set up the imagedefinitions.json file.

- 1. As part of planning the container-based application deployment for your pipeline, plan the source stage and the build stage, if applicable.
- 2. Choose one of the following:
 - a. If your pipeline is created so that it skips the build stage, you must manually create the JSON file and upload it to your source repository so the source action can provide the artifact. Create the file using a text editor, and name the file or use the default imagedefinitions.json file name. Push the image definitions file to your source repository.

🚯 Note

If your source repository is an Amazon S3 bucket, remember to zip the JSON file.

b. If your pipeline has a build stage, add a command to your build spec file that outputs the image definitions file in your source repository during the build phase. The following

example uses the **printf** command to create an imagedefinitions.json file. List this command in the post_build section of the buildspec.yml file:

```
printf '[{"name":"container_name","imageUri":"image_URI"}]' >
imagedefinitions.json
```

You must include the image definitions file as an output artifact in the buildspec.yml file.

3. When you create your pipeline in the console, on the **Deploy** page of the **Create Pipeline** wizard, in **Image Filename**, enter the image definitions file name.

For a step-by-step tutorial for creating a pipeline that uses Amazon ECS as the deployment provider, see <u>Tutorial: Continuous Deployment with CodePipeline</u>.

imageDetail.json file for Amazon ECS blue/green deployment actions

An imageDetail.json document is a JSON file that describes your Amazon ECS image URI. If you are deploying container-based applications for a blue/green deployment, you must generate the imageDetail.json file to provide the Amazon ECS and CodeDeploy job worker with the image identification to retrieve from the image repository, such as Amazon ECR.

🚺 Note

The name of the file must be imageDetail.json.

For a description of the action and its parameters, see <u>Amazon Elastic Container Service and</u> <u>CodeDeploy blue-green deploy action reference</u>.

You must create the imageDetail.json file as a source or build artifact so that it is an input artifact for the deploy action. You can use one of these methods to provide the imageDetail.json file in the pipeline:

• Include the imageDetail.json file in your source location so that it is provided in the pipeline as input to your Amazon ECS blue/green deployment action.

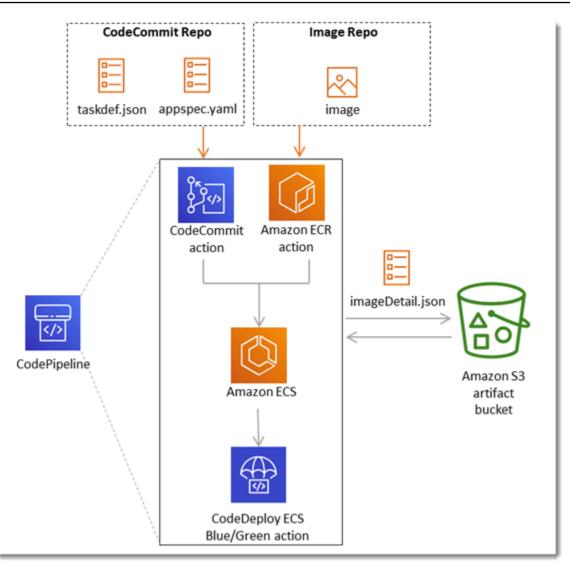
(i) Note

If your source repository is an Amazon S3 bucket, remember to zip the JSON file.

• Amazon ECR source actions automatically generate an imageDetail.json file as an input artifact to the next action.

1 Note

Because the Amazon ECR source action creates this file, pipelines with an Amazon ECR source action do not need to manually provide an imageDetail.json file. For a tutorial about creating a pipeline that includes an Amazon ECR source stage, see <u>Tutorial</u>: <u>Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy</u> <u>deployment</u>.



The imageDetail.json file provides the image URI. It must be constructed with the following key-value pair.

Кеу	Value
ImageURI	image_URI

imageDetail.json

Here is the JSON structure, where the image URI is ACCOUNTID.dkr.ecr.uswest-2.amazonaws.com/dk-image-repo@sha256:example3:

{

```
User Guide
```

```
"ImageURI": "ACCOUNTID.dkr.ecr.us-west-2.amazonaws.com/dk-image-
repo@sha256:example3"
}
```

imageDetail.json (generated by ECR)

An imageDetail.json file is generated automatically by the Amazon ECR source action each time a change is pushed to the image repository. The imageDetail.json generated by Amazon ECR source actions is provided as an output artifact from the source action to the next action in the pipeline.

Here is the JSON structure, where the repository name is dk-image-repo, the image URI is ecs-repo, and the image tag is latest:

```
{
    "ImageSizeInBytes": "44728918",
    "ImageDigest":
    "sha256:EXAMPLE11223344556677889900bfea42ea2d3b8a1ee8329ba7e68694950afd3",
    "Version": "1.0",
    "ImagePushedAt": "Mon Jan 21 20:04:00 UTC 2019",
    "RegistryId": "EXAMPLE12233",
    "RepositoryName": "dk-image-repo",
    "ImageURI": "ACCOUNTID.dkr.ecr.us-west-2.amazonaws.com/dk-image-
repo@sha256:example3",
    "ImageTags": [
        "latest"
    ]
}
```

The imageDetail.json file maps the image URI and container name to the Amazon ECS task definition as follows:

- ImageSizeInBytes: The size, in bytes, of the image in the repository.
- ImageDigest: The sha256 digest of the image manifest.
- Version: The image version.
- ImagePushedAt: The date and time when the latest image was pushed to the repository.
- RegistryId: The Amazon account ID associated with the registry that contains the repository.
- RepositoryName: The name of the Amazon ECR repository where the image was pushed.

- ImageURI: The URI for the image.
- ImageTags: The tag used for the image.

Before you create your pipeline, use the following steps to set up the imageDetail.json file.

- 1. As part of planning the container-based application blue/green deployment for your pipeline, plan the source stage and the build stage, if applicable.
- 2. Choose one of the following:
 - a. If your pipeline has skipped the build stage, you must manually create the JSON file and upload it to your source repository, such as CodeCommit, so the source action can provide the artifact. Create the file using a text editor, and name the file or use the default imageDetail.json file name. Push the imageDetail.json file to your source repository.
 - b. If your pipeline has a build stage, perform the following:
 - Add a command to your build spec file that outputs the image definitions file in your source repository during the build phase. The following example uses the printf command to create an imageDetail.json file. List this command in the post_build section of the buildspec.yml file:

printf '{"ImageURI":"image_URI"}' > imageDetail.json

You must include the imageDetail.json file as an output artifact in the buildspec.yml file.

ii. Add the imageDetail.json as an artifact file in the buildspec.yml file.

```
artifacts:
files:
- imageDetail.json
```

Variables reference

This section is a reference only. For information about creating variables, see <u>Working with</u> variables.

Variables allow you to configure your pipeline actions with values that are determined at the time of the pipeline execution or the action execution.

Some action providers produce a defined set of variables. You choose from default variable keys for that action provider, such as commit ID.

🔥 Important

When passing secret parameters, do not enter the value directly. The value is rendered as plaintext and is therefore readable. For security reasons, do not use plaintext with secrets. We strongly recommend that you use Amazon Secrets Manager to store secrets.

To see step-by-step examples of using variables:

- For a tutorial with a pipeline-level variable that is passed at the time of the pipeline execution, see Tutorial: Use pipeline-level variables.
- For a tutorial with a Lambda action that uses variables from an upstream action (CodeCommit) and generates output variables, see <u>Tutorial</u>: Using variables with Lambda invoke actions.
- For a tutorial with a Amazon CloudFormation action that references stack output variables from an upstream CloudFormation action, see <u>Tutorial: Create a pipeline that uses variables from</u> <u>Amazon CloudFormation deployment actions</u>.
- For an example manual approval action with message text that references output variables that resolve to the CodeCommit commit ID and commit message, see Example: Use variables in manual approvals.
- For an example CodeBuild action with an environment variable that resolves to the GitHub branch name, see Example: Use a BranchName variable with CodeBuild environment variables.
- CodeBuild actions produce as variables all environment variables that were exported as part of the build. For more information, see CodeBuild action output variables.

Variable Limits

🚯 Note

When you enter variable syntax in the action configuration fields, do not exceed the 1000character limit for the configuration fields. A validation error is returned when this limit is exceeded.

Topics

- Concepts
- Use cases for variables
- Configuring variables
- Variable resolution
- Rules for variables
- Variables available for pipeline actions

Concepts

This section lists key terms and concepts related to variables and namespaces.

Variables

Variables are key-value pairs that can be used to dynamically configure actions in your pipeline. There are currently three ways these variables are made available:

- There is a set of variables that are implicitly available at the start of each pipeline execution. This set currently includes PipelineExecutionId, the ID of the current pipeline execution.
- Variables at the pipeline level are defined when the pipeline is created and resolved at pipeline run time.

You specify pipeline-level variables when the pipeline is created, and you can provide values at the time of the pipeline execution.

• There are action types that produce sets of variables when they are executed. You can see the variables produced by an action by inspecting the outputVariables field that is part of the ListActionExecutions API. For a list of available key names by action provider, see Variables

<u>available for pipeline actions</u>. To see which variables each action type produces, see the CodePipeline <u>Action structure reference</u>.

To reference these variables in your action configuration, you must use the variable reference syntax with the correct namespace.

For an example variable workflow, see <u>Configuring variables</u>.

Namespaces

To ensure that variables can be uniquely referenced, they must be assigned to a namespace. After you have a set of variables assigned to a namespace, they can be referenced in an action configuration by using the namespace and variable key with the following syntax:

#{namespace.variable_key}

There are three types of namespaces under which variables can be assigned:

• The codepipeline reserved namespace

This is the namespace assigned to the set of implicit variables available at the start of each pipeline execution. This namespace is codepipeline. Example variable reference:

#{codepipeline.PipelineExecutionId}

• The variables namespace at the pipeline level

This is the namespace assigned to variables at the pipeline level. The namespace for all variables at the pipeline level is variables. Example variable reference:

#{variables.variable_name}

• Action assigned namespace

This is a namespace that you assign to an action. All variables produced by the action fall under this namespace. To make the variables produced by an action available for use in a downstream action configuration, you must configure the producing action with a namespace. Namespaces must be unique across the pipeline definition and cannot conflict with any artifact names. Here is an example variable reference for an action configured with a namespace of SourceVariables.

#{SourceVariables.VersionId}

Use cases for variables

The following are a few of the most common use cases for variables at the pipeline level, helping you determine how you might use variables for your specific needs.

- Variables at the pipeline level are for CodePipeline customers who want to use the same pipeline each time with minor variations in the inputs to the action configuration. Any developer who starts a pipeline adds the variable value in the UI when the pipeline starts. With this configuration, you pass parameters for that execution only.
- With pipeline-level variables, you can pass dynamic inputs to actions in the pipeline. You can migrate your parameterized pipelines to CodePipeline without having to maintain different versions of the same pipeline, or create complex pipelines.
- You can use pipeline-level variables to pass input parameters that allow you to re-use a pipeline with each execution, such as when you want to specify which version you want to deploy to a production environment, so you don't have to duplicate pipelines.
- You can use a single pipeline to deploy resources to multiple build and deployment environments. For example, for a pipeline with a CodeCommit repository, deploying from a specified branch and target deployment environment can be done with CodeBuild and CodeDeploy parameters passed at the pipeline level.

1 Note

For Amazon ECR, Amazon S3, or CodeCommit sources, you can also create a source override using input transform entry to use the revisionValue in EventBridge for your pipeline event, where the revisionValue is derived from the source event variable for your object key, commit, or image ID. For more information, see the optional step for input transform entry included in the procedures under <u>Amazon ECR source actions and EventBridge</u> resources, <u>Connecting to Amazon S3 source actions with a source enabled for events</u>, or <u>CodeCommit source actions and EventBridge</u>.

Configuring variables

You can configure variables at the pipeline level or the action level in the pipeline structure.

Configuring variables at the pipeline level

You can add one or more variables at the pipeline level. You can reference this value in the configuration of CodePipeline actions. You can add the variable names, default values, and descriptions when you create the pipeline. Variables are resolved at the time of execution.

i Note

If a default value is not defined for a variable at pipeline level, the variable is considered as required. You have to specify overrides for all required variables when you are starting a pipeline, otherwise the pipeline execution will fail with a validation error.

You provide variables at the pipeline level using the variables attribute in the pipeline structure. In the following example, the variable Variable1 has a value of Value1.

```
"variables": [
        {
            "name": "Variable1",
            "defaultValue": "Value1",
            "description": "description"
        }
]
```

For an example in the pipeline JSON structure, see Create a pipeline, stages, and actions.

For a tutorial with a pipeline-level variable that is passed at the time of the pipeline execution, see <u>Tutorial: Use pipeline-level variables</u>.

Note that using pipeline-level variables in any kind of Source action is not supported.

🚯 Note

If the variables namespace is already used in some of actions within the pipeline, you must update the action definition and choose another namespace for the conflicting action.

Configuring variables at the action level

You configure an action to produce variables by declaring a namespace for the action. The action must already be one of the action providers that generates variables. Otherwise, the variables available are pipeline-level variables.

You declare the namespace either by:

- On the **Edit action** page of the console, entering a namespace in **Variable namespace**.
- Entering a namespace in the namespace parameter field in the JSON pipeline structure.

In this example, you add the namespace parameter to the CodeCommit source action with the name SourceVariables. This configures the action to produce the variables available for that action provider, such as CommitId.

```
{
    "name": "Source",
    "actions": [
        {
            "outputArtifacts": [
                {
                     "name": "SourceArtifact"
                }
            ],
            "name": "Source",
            "namespace": "SourceVariables",
            "configuration": {
                "RepositoryName": "MyRepo",
                "BranchName": "mainline",
                "PollForSourceChanges": "false"
            },
            "inputArtifacts": [],
            "region": "us-west-2",
            "actionTypeId": {
                 "provider": "CodeCommit",
                "category": "Source",
                 "version": "1",
                "owner": "AWS"
            },
            "runOrder": 1
        }
```

]

},

Next, you configure the downstream action to use the variables produced by the previous action. You do this by:

- On the **Edit action** page of the console, entering the variable syntax (for the downstream action) in the action configuration fields.
- Entering the variable syntax (for the downstream action) in the action configuration fields in the JSON pipeline structure

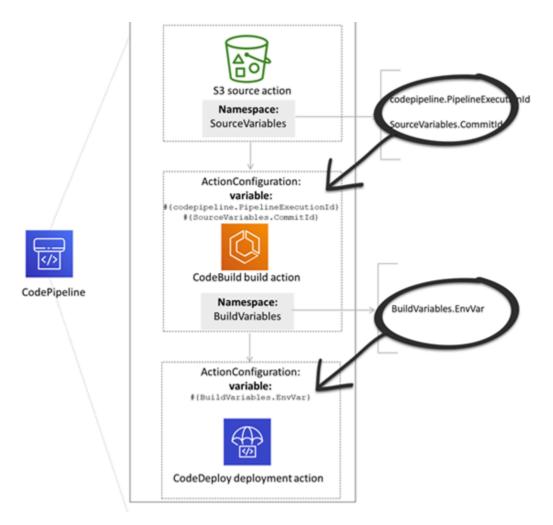
In this example, the build action's configuration field shows environment variables that are updated upon the action execution. The example specifies the namespace and variable for execution ID with #{codepipeline.PipelineExecutionId} and the namespace and variable for commit ID with #{SourceVariables.CommitId}.

```
{
    "name": "Build",
    "actions": [
        {
            "outputArtifacts": [
                {
                     "name": "BuildArtifact"
                }
            ],
            "name": "Build",
            "configuration": {
                "EnvironmentVariables": "[{\"name\":\"Release_ID\",\"value\":
\"#{codepipeline.PipelineExecutionId}\", \"type\":\"PLAINTEXT\"}, {\"name\":\"Commit_ID
\",\"value\":\"#{SourceVariables.CommitId}\",\"type\":\"PLAINTEXT\"}]",
                "ProjectName": "env-var-test"
            },
            "inputArtifacts": [
                {
                     "name": "SourceArtifact"
                }
            ],
            "region": "us-west-2",
            "actionTypeId": {
                "provider": "CodeBuild",
                "category": "Build",
```

```
"version": "1",
"owner": "AWS"
},
"runOrder": 1
}
]
},
```

Variable resolution

Each time an action is executed as part of a pipeline execution, the variables it produces are available for use in any action that is guaranteed to occur after the producing action. To use these variables in a consuming action, you can add them to the consuming action's configuration using the syntax shown in the previous example. Before it performs a consuming action, CodePipeline resolves all of the variable references present in the configuration prior to initiating the action execution.



Rules for variables

The following rules help you with the configuration of variables:

- You specify the namespace and variable for an action through a new action property or by editing an action.
- When you use the pipeline creation wizard, the console generates a namespace for each action created with the wizard.
- If the namespace isn't specified, the variables produced by that action cannot be referenced in any action configuration.
- To reference variables produced by an action, the referencing action must occur after the action that produces the variables. This means it is either in a later stage than the action producing the variables, or in the same stage but at a higher run order.

Variables available for pipeline actions

The action provider determines which variables can be generated by the action.

For step-by-step procedures for managing variables, see <u>Working with variables</u>.

Actions with defined variable keys

Unlike a namespace which you can choose, the following actions use variable keys that cannot be edited. For example, for the Amazon S3 action provider, only the ETag and VersionId variable keys are available.

Each execution also has a set of CodePipeline-generated pipeline variables that contain data about the execution, such as the pipeline release ID. These variables can be consumed by any action in the pipeline.

Topics

- <u>CodePipeline execution ID variable</u>
- <u>Amazon ECR action output variables</u>
- Amazon CloudFormation StackSets action output variables
- <u>CodeCommit action output variables</u>
- <u>CodeStarSourceConnection action output variables</u>

- GitHub action output variables (GitHub (via OAuth app) action)
- S3 action output variables

CodePipeline execution ID variable

CodePipeline execution ID variable

Provider	Variable key	Example value	Example variable syntax
codepipeline	PipelineE xecutionId	8abc75f0-fbf8-4f4c- bfEXAMPLE	#{codepip eline.Pip elineExec utionId}

Amazon ECR action output variables

Amazon ECR variables

Variable key	Example value	Example variable syntax
ImageDigest	sha256: EXAMPLE 1122334455	#{SourceVariables. ImageDigest}
ImageTag	latest	#{SourceVariables. ImageTag}
ImageURI	11111EXAMPLE.dkr.ecr.us-wes t-2.amazonaws.com/ecs-repo: latest	#{SourceVariables. ImageURI}
RegistryId	EXAMPLE12233	#{SourceVariables. RegistryId}
RepositoryName	my-image-repo	#{SourceVariables. RepositoryName}

Amazon CloudFormation StackSets action output variables

Amazon CloudFormation StackSets variables

Variable key	Example value	Example variable syntax
OperationId	11111111-2bbb-111-2bbb-1111 1example	#{DeployVariables. OperationId}
StackSetId	my-stackset:1111aaaa-1111-2 222-2bbb-11111example	#{DeployVariables. StackSetId}

CodeCommit action output variables

CodeCommit variables

Variable key	Example value	Example variable syntax
AuthorDate	2019-10-29T03:32:21Z	#{SourceVariables. AuthorDate}
BranchName	development	#{SourceVariables. BranchName}
CommitId	exampleb01f91b31	#{SourceVariables. CommitId}
CommitMessage	Fixed a bug (100 KB maximum size)	#{SourceVariables. CommitMessage}
CommitterDate	2019-10-29T03:32:21Z	#{SourceVariables. CommitterDate}
RepositoryName	myCodeCommitRepo	<pre>#{SourceVariables. RepositoryName}</pre>

CodeStarSourceConnection action output variables

CodeStarSourceConnection variables (Bitbucket Cloud, GitHub, GitHub Enterprise Repository, and GitLab.com)

Variable key	Example value	Example variable syntax
AuthorDate	2019-10-29T03:32:21Z	#{SourceVariables. AuthorDate}
BranchName	development	#{SourceVariables. BranchName}
CommitId	exampleb01f91b31	#{SourceVariables. CommitId}
CommitMessage	Fixed a bug (100 KB maximum size)	#{SourceVariables. CommitMessage}
ConnectionArn	arn:aws:codestar-connection s:region:account-id :connecti on/connection-id	#{SourceVariables. ConnectionArn}
FullRepositoryName	username/GitHubRepo	#{SourceVariables. FullRepositoryName}

GitHub action output variables (GitHub (via OAuth app) action)

GitHub variables (GitHub (via OAuth app) action)

Variable key	Example value	Example variable syntax
AuthorDate	2019-10-29T03:32:21Z	#{SourceVariables. AuthorDate}
BranchName	main	#{SourceVariables. BranchName}

Amazon CodePipeline

Variable key	Example value	Example variable syntax
CommitId	exampleb01f91b31	#{SourceVariables. CommitId}
CommitMessage	Fixed a bug (100 KB maximum size)	#{SourceVariables. CommitMessage}
CommitterDate	2019-10-29T03:32:21Z	#{SourceVariables. CommitterDate}
CommitUrl		#{SourceVariables. CommitUrl}
RepositoryName	myGitHubRepo	#{SourceVariables. RepositoryName}

S3 action output variables

S3 variables

Variable key	Example value	Example variable syntax
ETag	example28be1c3	#{SourceVariables. ETag}
VersionId	exampleta_IUQCv	#{SourceVariables. VersionId}

Actions with user-configured variable keys

For CodeBuild, Amazon CloudFormation, and Lambda actions, the variable keys are configured by the user.

Topics

- <u>CloudFormation action output variables</u>
- CodeBuild action output variables

CloudFormation action output variables

Amazon CloudFormation variables

Variable key	Example variable syntax
For Amazon CloudFormation actions, variables are produced from any values designated in the Outputs section of a stack template. Note that the only CloudFormation action modes that generate outputs are those that result in creating or updating a stack, such as stack creation, stack updates, and change set execution. The corresponding action modes that generate variables are: • CREATE_UPDATE • CHANGE_SET_EXECUTE • CHANGE_SET_REPLACE • REPLACE_ON_FAILURE For more information about these action modes, see <u>Amazon CloudFormation deploy action reference</u> . For a tutorial that shows you how to create a pipeline with an Amazon CloudFormation deployment action in a pipeline that uses Amazon CloudFormation output variables, see <u>Tutorial: Create a pipeline that uses variables from Amazon</u> <u>CloudFormation deployment actions</u> .	<pre>#{DeployVariables. StackName}</pre>
CodeBuild variables	
Variable key	Example variable syntax

For CodeBuild actions, variables are produced from values generated by exported environment variables. Set up a

#{BuildVariables.EnvVar}

Variable key	Example variable syntax
CodeBuild environment variable by editing your CodeBuild action in CodePipeline or by adding the environment variable to the build spec.	
Add instructions to your CodeBuild build spec to add the environment variable under the exported variables section. See <u>env/exported-variables</u> in the <i>Amazon CodeBuild User</i> <i>Guide</i> .	

Lambda action output variables

Lambda variables

Variable key	Example variable syntax
The Lambda action will produce as variables all key-value pairs that are included in the outputVariables section of the <u>PutJobSuccessResult API</u> request.	#{TestVariables.te stRunId}
For a tutorial with a Lambda action that uses variables from an upstream action (CodeCommit) and generates output variables, see <u>Tutorial: Using variables with Lambda invoke</u> actions.	

User Guide

Working with glob patterns in syntax

When you specify the files or paths that are used in pipeline artifacts or source locations, you can specify the artifact depending on the action type. For example, for the S3 action, you specify the S3 object key.

For triggers, you can specify filters. You can use glob patterns to specify filters. The following are examples.

When the syntax is "glob" then the String representation of the path is matched using a limited pattern language with a syntax that resembles regular expressions. For example:

- *. java Specifies a path that represents a file name ending in .java
- *.* Specifies file names containing a dot
- *. {java, class} Specifies file names ending with .java or .class
- foo.? Specifies file names starting with foo. and a single character extension

The following rules are used to interpret glob patterns:

- To specify zero or more characters of a name component in directory boundaries, use *.
- To specify zero or more characters of a name component crossing directory boundaries, use **.
- To specify one character of a name component, use ?.
- To escape characters that would otherwise be interpreted as special characters, use the backslash character (\).
- To specify a single character out of a set of characters, use [].
- To specify a single file that is in the root of your build location or source repository location, use my-file.jar.
- To specify a single file in a subdirectory, use directory/my-file.jar or directory/ subdirectory/my-file.jar.
- To specify all files, use "**". The ** glob pattern indicates to match any number of subdirectories.
- To specify all files and directories in a directory named directory, use "directory/**". The ** glob pattern indicates to match any number of subdirectories.

- To specify all files in a directory named directory, but not any of its subdirectories, use "directory/*".
- Within a bracket expression the *, ? and \ characters match themselves. The (-) character matches itself if it is the first character within the brackets, or the first character after the ! if negating.
- The { } characters are a group of subpatterns, where the group matches if any subpattern in the group matches. The ", " character is used to separate the subpatterns. Groups cannot be nested.

Update polling pipelines to the recommended change detection method

If you have a pipeline that uses polling to react to source changes, you can update it to use the recommended detection method. For a migration guide with instructions for updating your polling piplines to use the recommended event-based change detection method, see <u>Migrate polling</u> pipelines to use event-based change detection.

Update a GitHub (via OAuth app) source action to a GitHub (via GitHub App) source action

In Amazon CodePipeline, there are two supported versions of the GitHub source action:

- Recommended: The GitHub (via GitHub App) action uses Github app-based auth backed by a <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> <u>and GitLab self-managed actions</u> resource. It installs an AWS CodeStar Connections application into your GitHub organization so that you can manage access in GitHub.
- Not recommended: The GitHub (via OAuth app) action uses OAuth tokens to authenticate with GitHub and uses a separate webhook to detect changes. This is no longer the recommended method.

1 Note

The CodePipeline action for connections is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service integrations</u> with CodePipeline.

There are some important advantages to using the GitHub (via GitHub App) action instead of the GitHub (via OAuth app) action:

- With connections, CodePipeline no longer requires OAuth apps or personal access tokens to access your repository. When you create a connection, you install a GitHub App that manages authentication to your GitHub repository and allows permissions at the organization level. You must authorize OAuth tokens as a user to access the repository. For more information about OAuth-based GitHub access in contrast to App-based GitHub access, see https://docs.github.com/en/developers/apps/differences-between-github-apps-and-oauth-apps.
- When you manage GitHub (via GitHub App) actions in the CLI or CloudFormation, you no longer have to store your personal access token as a secret in Secrets Manager. You no longer have to dynamically reference the stored secret in your CodePipeline action configuration. You instead add the connection ARN to your action configuration. For an example action configuration, see <u>CodeStarSourceConnection for Bitbucket Cloud, GitHub, GitHub Enterprise Server, GitLab.com,</u> and GitLab self-managed actions.

- When you create a connection resource to use with your GitHub (via GitHub App) action in CodePipeline, you can use the same connection resource to associate other supported services, such as CodeGuru Reviewer, with your repository.
- In Github (via GitHub App), you can clone repositories to access git metadata in subsequent CodeBuild actions, while in Github (via OAuth app) you can only download the source.
- An administrator installs the app for your organization's repositories. You no longer have to track OAuth tokens that depend on the individual who created the token.

All apps installed to an organization have access to the same set of repositories. To change who can access each repository, modify the IAM policy for each connection. For an example, see <u>Example: A</u> <u>scoped-down policy for using connections with a specified repository</u>.

You can use the steps in this topic to delete your GitHub (via OAuth app) source action and add a GitHub (via GitHub App) source action from the CodePipeline console.

Topics

- Step 1: Replace your (via OAuth app) GitHub action
- Step 2: Create a connection to GitHub
- Step 3: Save your GitHub source action

Step 1: Replace your (via OAuth app) GitHub action

Use the pipeline edit page to replace your (via OAuth app) GitHub action with a GitHub (via GitHub App) action.

To replace your (via OAuth app) GitHub action

- 1. Sign in to the CodePipeline console.
- 2. Choose your pipeline, and choose **Edit**. Choose **Edit stage** on your source stage. A message displays that recommends you update your action.
- 3. In Action provider, choose GitHub (via GitHub App).
- 4. Do one of the following:
 - Under Connection, if you have not already created a connection to your provider, choose
 Connect to GitHub. Proceed to Step 2: Create a connection to GitHub.

• Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to Step 3: Save the Source Action for Your Connection.

Step 2: Create a connection to GitHub

After you choose to create the connection, the **Connect to GitHub** page is shown.

To create a connection to GitHub

1. Under **GitHub connection settings**, your connection name is shown in **Connection name**.

Under GitHub Apps, choose an app installation or choose Install a new app to create one.

🚯 Note

You install one app for all of your connections to a particular provider. If you have already installed the GitHub app, choose it and skip this step.

- 2. If the authorization page for GitHub displays, log in with your credentials and then choose to continue.
- 3. On the app installation page, a message shows that the AWS CodeStar app is trying to connect to your GitHub account.

🚯 Note

You only install the app once for each GitHub account. If you previously installed the app, you can choose **Configure** to proceed to a modification page for your app installation, or you can use the back button to return to the console.

- 4. On the **Install AWS CodeStar** page, choose **Install**.
- 5. On the **Connect to GitHub** page, the connection ID for your new installation is displayed. Choose **Connect**.

Step 3: Save your GitHub source action

Complete your updates on the **Edit action** page to save your new source action.

To save your GitHub source action

1. In **Repository**, enter the name of your third-party repository. In **Branch**, enter the branch where you want your pipeline to detect source changes.

🚯 Note

In **Repository**, type owner-name/repository-name as shown in this example:

my-account/my-repository

- 2. In **Output artifact format**, choose the format for your artifacts.
 - To store output artifacts from the GitHub action using the default method, choose
 CodePipeline default. The action accesses the files from the GitHub repository and stores the artifacts in a ZIP file in the pipeline artifact store.
 - To store a JSON file that contains a URL reference to the repository so that downstream actions can perform Git commands directly, choose Full clone. This option can only be used by CodeBuild downstream actions.

If you choose this option, you will need to update the permissions for your CodeBuild project service role as shown in <u>Add CodeBuild GitClone permissions for connections to Bitbucket</u>, <u>GitHub, GitHub Enterprise Server, or GitLab.com</u>. For a tutorial that shows you how to use the **Full clone** option, see Tutorial: Use full clone with a GitHub pipeline source.

- 3. In **Output artifacts**, you can retain the name of the output artifact for this action, such as SourceArtifact. Choose **Done** to close the **Edit action** page.
- 4. Choose **Done** to close the stage editing page. Choose **Save** to close the pipeline editing page.

Quotas in Amazon CodePipeline

CodePipeline has quotas for the number of pipelines, stages, actions, and webhooks that an Amazon account can have in each Amazon Region.

These quotas apply per Region and can be increased. It can take up to two weeks to process requests for a quota increase.

Resource	Default
Resource	Amazon CloudFormation deployment action: 3 days CodeDeploy and CodeDeploy ECS (blue/ green) deployment actions: 5 days Amazon Lambda invoke action: 24 hours Mhile the action is running, CodePipeline periodically contacts Lambda for a status. The Lambda function replies with a status where the action execution is either successful, failed, or in progress. If the Lambda function has sent no reply after 20 minutes, the action times out. If, during the 20 minutes, the Lambda function has replied that the action is still in progress, CodePipeline restarts the
	20-minute timer and tries again. If not successful after 24 hours, CodePipeline sets the Lambda
	invoke action state to failed. Lambda has a separate timeout
	for Lambda functions that is not

Resource

Default

related to the CodePipeline action timeout.

Amazon S3 deployment action: 90 minutes

1 Note

If the upload to S3 times out during deployment of a large ZIP file, the action fails with a timeout error. Try breaking up the ZIP file into smaller files.

Manual approval action account level default timeout: 7 days

Note

The default timeout for the manual approval action can be overridden for a specific action in the pipeline, and it is configurable up to 86400 minutes (60 days) with a minimum value of 5 minutes. For more information, see <u>ActionDeclaration</u> in the *CodePipeline API Reference*. When configured, this timeout is applied for the action. Otherwise, the account level default is used.

All other actions: 1 hour

Resource	Default
	(i) Note The Amazon ECS deployment action timeout is configurable up to one hour (the default timeout).
Maximum number of total pipelines per Region in an Amazon account	1000 (i) Note Pipelines configured for either polling or event-based change detection are counted toward this quota.
Maximum number of pipelines set to polling for source changes, per Amazon Region	300 Note This quota is fixed and cannot be changed. If you reach the limit for polling pipelines, you can still configure additional pipelines that use event-based change detection . For more information, see <u>Source actions and change detection</u> .methods. ¹
Maximum number of webhooks per Region in an Amazon account	300
Number of custom actions per Region in an Amazon account	50

Resource

Default

¹Based on your source provider, use the following instructions to update your polling pipelines to use event-based change detection:

- To update a CodeCommit source action, see <u>Migrate polling pipelines (CodeCommit or</u> <u>Amazon S3 source) (console)</u>.
- To update an Amazon S3 source action, see <u>Migrate polling pipelines</u> (CodeCommit or Amazon S3 source) (console).
- To update a GitHub source action, see <u>Migrate polling pipelines to webhooks (GitHub (via</u> <u>OAuth app) source actions) (console)</u>.

The following quotas in Amazon CodePipeline apply to Region availability, naming constraints, and allowed artifact sizes. These quotas are fixed and cannot be changed.

For a list of the CodePipeline service endpoints for each Region, see <u>Amazon CodePipeline</u> <u>endpoints and quotas</u> in the *Amazon General Reference*.

For information about structural requirements, see <u>CodePipeline pipeline structure reference</u>.

Amazon Regions where you can create a pipeline	US East (Ohio)
	US East (N. Virginia)
	US West (N. California)
	US West (Oregon)
	Canada (Central)
	Europe (Frankfurt)
	Europe (Zurich)*
	Israel (Tel Aviv)
	Europe (Ireland)
	Europe (London)

Europe (Milan)*

Europe (Paris)

Europe (Spain)

Europe (Stockholm)

Africa (Cape Town)*

Asia Pacific (Hong Kong)*

Asia Pacific (Hyderabad)

Asia Pacific (Mumbai)

Asia Pacific (Tokyo)

Asia Pacific (Seoul)

Asia Pacific (Osaka)

Asia Pacific (Singapore)

Asia Pacific (Sydney)

Asia Pacific (Jakarta)

Asia Pacific (Melbourne)

South America (São Paulo)

Middle East (Bahrain)*

Middle East (UAE)

Amazon GovCloud (US-West)

Amazon GovCloud (US-East)

Characters allowed in an action name	Action names cannot exceed 100 characters. Allowed characters include:
	Lowercase letters a through z, inclusive.
	Uppercase letters A through Z, inclusive.
	Numbers 0 through 9, inclusive.
	Special characters . (period), @ (at sign), - (minus sign), and _ (underscore).
	Any other characters, such as spaces, are not allowed.
Characters allowed in action types	Action type names cannot exceed 25 character s. Allowed characters include:
	Lowercase letters a through z, inclusive.
	Uppercase letters A through Z, inclusive.
	Numbers 0 through 9, inclusive.
	Special characters . (period), @ (at sign), - (minus sign), and _ (underscore).
	Any other characters, such as spaces, are not allowed.

Characters allowed in artifact names	 Artifact names cannot exceed 100 characters. Allowed characters include: Lowercase letters a through z, inclusive. Uppercase letters A through Z, inclusive. Numbers 0 through 9, inclusive. Special characters - (minus sign), and _
	(underscore). Any other characters, such as spaces, are not allowed.
Characters allowed in partner action names	Partner action names must follow the same naming conventions and restrictions as other action names in CodePipeline. Specifically, they cannot exceed 100 characters. Allowed characters include:
	Lowercase letters a through z, inclusive.
	Uppercase letters A through Z, inclusive.
	Numbers 0 through 9, inclusive.
	Special characters . (period), @ (at sign), - (minus sign), and _ (underscore).
	Any other characters, such as spaces, are not allowed.

Characters allowed in a pipeline name	Pipeline names cannot exceed 100 characters. Allowed characters include:
	Lowercase letters a through z, inclusive.
	Uppercase letters A through Z, inclusive.
	Numbers 0 through 9, inclusive.
	Special characters . (period), @ (at sign),- (minus sign), and _ (underscore).
	Any other characters, such as spaces, are not allowed.
Characters allowed in a stage name	Stage names cannot exceed 100 characters. Allowed characters include:
	Lowercase letters a through z, inclusive.
	Uppercase letters A through Z, inclusive.
	Numbers 0 through 9, inclusive.
	Special characters . (period), @ (at sign), - (minus sign), and _ (underscore).
	Any other characters, such as spaces, are not allowed.
Length of time before an action times out	CodeBuild build action: 36 hours
	Test action: 8 hours
	Custom actions: 24 hours
	Step Functions invoke action: 7 days
	Build timeout for the Commands action: 55 minutes

Maximum length of the action configuration key (for example, the CodeBuild configuration keys are ProjectName , PrimarySource , and EnvironmentVariables)	50 characters
Maximum length of the action configura tion value (for example, the value of the RepositoryName configuration in the CodeCommit action configuration should be less than 1000 characters:	1000 characters
"RepositoryName": "my-repo-name- less-than-1000-characters")	
Maximum number of actions per pipeline	1000
Maximum number of concurrent pipeline executions per pipeline (QUEUED PARALLEL mode)	50
Maximum number of concurrent action executions per PARALLEL mode pipeline execution	5
Maximum number of files for an Amazon S3 object	100,000
Maximum number of parallel actions in a stage	100
Maximum number of sequential actions in a stage	100

Maximum size of artifacts in a source stage	Artifacts stored in Amazon S3 buckets: 7 GB
	Artifacts stored in CodeCommit or GitHub repositories: 1 GB
	Exception: If you are using Amazon Elastic Beanstalk to deploy applications, the maximum artifact size is always 512 MB.
	Exception: If you are using Amazon CloudForm ation to deploy applications, the maximum artifact size is always 256 MB.
	Exception: If you are using the CodeDeplo yToECS action to deploy applications, the maximum artifact size is always 3 MB.
Maximum size of the image definitions JSON file used in pipelines deploying Amazon ECS containers and images	100 КВ
Maximum size of input artifacts for Amazon CloudFormation actions	256 MB
Maximum size of input artifacts for the CodeDeployToECS action	3 MB
Maximum size of input artifacts for the Step Functions action	The Step Functions action runs on Lambda, and it therefore has artifact size quotas that are the same as the artifact size quotas for Lambda functions. For more information, see Lambda quotas in the Lambda Developer Guide.

Maximum size of the JSON object that can	For a CodePipeline deploy action with
be stored in the ParameterOverrides property	Amazon CloudFormation as the provider, the ParameterOverrides property is used to store a JSON object that specifies values for the Amazon CloudFormation template configuration file. There is a maximum size limit of 1 kilobyte for the JSON object that can be stored in the ParameterOverrides property.
Number of actions in a stage	Minimum of 1, maximum of 50
Number of artifacts allowed for each action	For the number of input and output artifacts allowed for each action, see the <u>Valid input</u> and output artifacts for each action type
Number of months that pipeline execution history information is retained	12
Number of stages in a pipeline	Minimum of 2, maximum of 50
Pipeline tags	Tags are case sensitive. Maximum of 50 per resource.
Pipeline tag key names	 Any combination of Unicode letters, numbers, spaces, and allowed characters in UTF-8 between 1 and 128 characters in length. Allowed characters are + - = : / @ Tag key names must be unique, and each key can have only one value. A tag cannot: begin with Amazon: consist only of spaces end with a space contain emojis or any of the following characters: ? ^ * [\ ~ ! # \$ % & * () > <] " '

Pipeline tag values

Any combination of Unicode letters, numbers, spaces, and allowed characters in UTF-8 between 1 and 256 characters in length. Allowed characters are $+ - = . _ : / @$

A key can have only one value, but many keys can have the same value. A tag cannot:

- begin with Amazon:
- consist only of spaces
- end with a space
- contain emojis or any of the following characters: ? ^ * [\ ~ ! # \$ % & * () > < | " '

User Guide

Triggers

There is a maximum of 50 triggers in a pipeline definition across the push and pull request configuration.

There is a maximum of three filters per push trigger and pull request trigger.

Note

Duplicates for filters in the same event type array are not allowed.

You can add up to 8 include and 8 exclude patterns, branches, and file paths for each event type (push, pull request).

Allowed characters in patternvalues include all character types.

For include and exclude patterns, there is a maximum length of 255 characters.

For tag names, there is a maximum length of 255 characters.

Maximum size of triggers array should not exceed 200 KB

Trigger filters	File paths:
	• Number of patterns: You can add up to 8
	include and 8 exclude patterns.
	 Size of pattern: Each include or exclude
	pattern's size can be up to 255 characters.
	Branches:
	 Number of patterns: You can add up to 8
	include and 8 exclude patterns.
	 Size of pattern: Each include or exclude
	pattern's size can be up to 255 characters.
	Pull requests:
	Branches:
	 Number of patterns: You can add up to 8
	include and 8 exclude patterns.
	 Size of pattern: Each include or exclude
	pattern's size can be up to 255 characters.
Uniqueness of names	Within a single Amazon account, each pipeline
	you create in an Amazon Region must have
	a unique name. You can reuse names for
	pipelines in different Amazon Regions.
	Stage names must be unique within a pipeline.
	Action names must be unique within a stage.

Quotas for output variables and namespaces
--

There is a maximum size limit of 122880 bytes for all output variables combined for a particular action.

There is a maximum size limit of 100 KB for the total resolved action configuration for a particular action.

Output variable names are case sensitive.

Namespaces are case sensitive.

Allowed characters include:

- Lowercase letters a through z, inclusive.
- Uppercase letters A through Z, inclusive.
- Numbers 0 through 9, inclusive.
- Special characters ^ (caret), @ (at sign), -(minus sign), _ (underscore), [(left bracket),] (right bracket), * (asterisk), \$ (dollar sign).

Any other characters, such as spaces, are not allowed.

Quotas for variables at the pipeline level	There is a maximum of 50 pipeline-level variables per pipeline.
	Variable names for variables at the pipeline level must be:
	 128 characters maximum length Lowercase letters a through z, inclusive. Uppercase letters A through Z, inclusive. Numbers 0 through 9, inclusive. Special characters @\]+ Any other characters, such as spaces, are not allowed.
	For variable values, there is a maximum length of 1000 characters For variable values, all characters are allowed.
	For variable descriptions, there is a maximum length of 200 characters.

* You must enable this Region before you can use it.

Appendix A: GitHub (via OAuth app) source actions

This appendix provides information about (via OAuth app) of the GitHub action in CodePipeline.

(i) Note

The CodePipeline action for GitHub (via OAuth app) is not available in the China (Beijing) and China (Ningxia) Regions. To reference other available actions, see <u>Product and service</u> integrations with CodePipeline.

While we don't recommend using the GitHub (via OAuth app) action, existing pipelines with the GitHub (via OAuth app) action will continue to work without any impact. For a pipeline with a GitHub (via OAuth app) action, CodePipeline uses OAuth-based tokens to connect to your GitHub repository. By contrast, the GitHub action (via GitHub App) uses a connection resource to associate Amazon resources to your GitHub repository. The connection resource uses app-based tokens to connect. For more information about updating your pipeline to the recommended GitHub action that uses a connection, see <u>Update a GitHub (via OAuth app) source action to a GitHub (via GitHub App) source action</u>. For more information about OAuth-based GitHub access in contrast to app-based GitHub access, see <u>https://</u>docs.github.com/en/developers/apps/differences-between-github-apps-and-oauth-apps.

To integrate with GitHub, CodePipeline uses a GitHub OAuth application for your pipeline. CodePipeline uses webhooks to manage change detection for your pipeline with the GitHub (via OAuth app) source action.

i Note

When you configure a GitHub (via GitHub App) source action in Amazon CloudFormation, you do not include any GitHub token information or add a webhook resource. You configure a connections resource as shown in <u>AWS::CodeStarConnections::Connection</u> in the *Amazon CloudFormation User Guide*.

This reference contains the following sections for the GitHub (via OAuth app) action:

• For information about how to add a GitHub (via OAuth app) source action and webhook to a pipeline, see Adding a GitHub (via OAuth app) source action.

• For information about the configuration parameters and example YAML/JSON snippets for a GitHub (via OAuth app) source action, see GitHub (via OAuth app) source action reference.

<u> Important</u>

When creating CodePipeline webhooks, do not use your own credentials or reuse the same secret token across multiple webhooks. For optimal security, generate a unique secret token for each webhook you create. The secret token is an arbitrary string that you provide, which GitHub uses to compute and sign the webhook payloads sent to CodePipeline, for protecting the integrity and authenticity of the webhook payloads. Using your own credentials or reusing the same token across multiple webhooks can lead to security vulnerabilities.

🚺 Note

If a secret token was provided, it will be redacted in the response.

Topics

- Adding a GitHub (via OAuth app) source action
- GitHub (via OAuth app) source action reference

Adding a GitHub (via OAuth app) source action

You add GitHub (via OAuth app) source actions to CodePipeline by:

- Using the CodePipeline console Create pipeline wizard (Create a custom pipeline (console)) or Edit action page to choose the GitHub provider option. The console creates a webhook that starts your pipeline when the source changes.
- Using the CLI to add the action configuration for the GitHub action and creating additional resources as follows:
 - Using the GitHub example action configuration in <u>GitHub (via OAuth app) source action</u> reference to create the action as shown in <u>Create a pipeline (CLI)</u>.

• Disabling periodic checks and creating the change detection manually, because the change detection method defaults to starting the pipeline by polling the source. You migrate your polling pipeline to webhooks for GitHub (via OAuth app) actions.

GitHub (via OAuth app) source action reference

🚯 Note

While we don't recommend using the GitHub (via OAuth app) action, existing pipelines with the GitHub (via OAuth app) action will continue to work without any impact. For a pipeline with a GitHub GitHub (via OAuth app) source action, CodePipeline uses OAuth-based tokens to connect to your GitHub repository. By contrast, the new GitHub action (via GitHub App) uses a connection resource to associate Amazon resources to your GitHub repository. The connection resource uses app-based tokens to connect. For more information about updating your pipeline to the recommended GitHub action that uses a connection, see <u>Update a GitHub (via OAuth app) source action to a GitHub (via GitHub App) source action</u>.

Triggers the pipeline when a new commit is made on the configured GitHub repository and branch.

To integrate with GitHub, CodePipeline uses an OAuth application or a personal access token for your pipeline. If you use the console to create or edit your pipeline, CodePipeline creates a GitHub webhook that starts your pipeline when a change occurs in the repository.

You must have already created a GitHub account and repository before you connect the pipeline through a GitHub action.

If you want to limit the access CodePipeline has to repositories, create a GitHub account and grant the account access only to those repositories you want to integrate with CodePipeline. Use that account when you configure CodePipeline to use GitHub repositories for source stages in pipelines.

For more information, see the <u>GitHub developer documentation</u> on the GitHub website.

Topics

- Action type
- <u>Configuration parameters</u>
- Input artifacts

- Output artifacts
- Output variables
- Action declaration (GitHub example)
- <u>Connecting to GitHub (OAuth)</u>
- See also

Action type

- Category: Source
- Owner: ThirdParty
- Provider: GitHub
- Version: 1

Configuration parameters

Owner

Required: Yes

The name of the GitHub user or organization who owns the GitHub repository.

Repo

Required: Yes

The name of the repository where source changes are to be detected.

Branch

Required: Yes

The name of the branch where source changes are to be detected.

OAuthToken

Required: Yes

Represents the GitHub authentication token that allows CodePipeline to perform operations on your GitHub repository. The entry is always displayed as a mask of four asterisks. It represents one of the following values:

- When you use the console to create the pipeline, CodePipeline uses an OAuth token to register the GitHub connection.
- When you use the Amazon CLI to create the pipeline, you can pass your GitHub personal access token in this field. Replace the asterisks (****) with your personal access token copied from GitHub. When you run get-pipeline to view the action configuration, the four-asterisk mask is displayed for this value.
- When you use an Amazon CloudFormation template to create the pipeline, you must first store the token as a secret in Amazon Secrets Manager. You include the value for this field as a dynamic reference to the stored secret in Secrets Manager, such as {{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}.

For more information about GitHub scopes, see the <u>GitHub Developer API Reference</u> on the GitHub website.

PollForSourceChanges

Required: No

PollForSourceChanges controls whether CodePipeline polls the GitHub repository for source changes. We recommend that you use webhooks to detect source changes instead. For more information about configuring webhooks, see <u>Migrate polling pipelines to webhooks (GitHub</u> (via OAuth app) source actions) (CLI) or <u>Update pipelines for push events (GitHub (via OAuth app) source actions) (CLI)</u> or <u>Update pipelines for push events (GitHub (via OAuth app) source actions) (CLI)</u> or <u>Update pipelines for push events (GitHub (via OAuth app) source actions) (CLI)</u> or <u>Update pipelines for push events (GitHub (via OAuth app) source actions) (CLI)</u> or <u>Update pipelines for push events (GitHub (via OAuth app) source actions) (CLI)</u> or <u>Update pipelines for push events (GitHub (via OAuth app) source actions)</u> (CLI)

🔥 Important

If you intend to configure webhooks, you must set PollForSourceChanges to false to avoid duplicate pipeline executions.

Valid values for this parameter:

• True: If set, CodePipeline polls your repository for source changes.

Note

If you omit PollForSourceChanges, CodePipeline defaults to polling your repository for source changes. This behavior is the same as if PollForSourceChanges is set to true. • False: If set, CodePipeline does not poll your repository for source changes. Use this setting if you intend to configure a webhook to detect source changes.

Input artifacts

- Number of artifacts: 0
- **Description:** Input artifacts do not apply for this action type.

Output artifacts

- Number of artifacts: 1
- **Description:** The output artifact of this action is a ZIP file that contains the contents of the configured repository and branch at the commit specified as the source revision for the pipeline execution. The artifacts generated from the repository are the output artifacts for the GitHub action. The source code commit ID is displayed in CodePipeline as the source revision for the triggered pipeline execution.

Output variables

When configured, this action produces variables that can be referenced by the action configuration of a downstream action in the pipeline. This action produces variables which can be viewed as output variables, even if the action doesn't have a namespace. You configure an action with a namespace to make those variables available to the configuration of downstream actions.

For more information about variables in CodePipeline, see Variables reference.

CommitId

The GitHub commit ID that triggered the pipeline execution. Commit IDs are the full SHA of the commit.

CommitMessage

The description message, if any, associated with the commit that triggered the pipeline execution.

CommitUrl

The URL address for the commit that triggered the pipeline.

RepositoryName

The name of the GitHub repository where the commit that triggered the pipeline was made.

BranchName

The name of the branch for the GitHub repository where the source change was made.

AuthorDate

The date when the commit was authored, in timestamp format.

CommitterDate

The date when the commit was committed, in timestamp format.

Action declaration (GitHub example)

YAML

```
Name: Source
Actions:
  - InputArtifacts: []
    ActionTypeId:
      Version: '1'
      Owner: ThirdParty
      Category: Source
      Provider: GitHub
    OutputArtifacts:
      - Name: SourceArtifact
    RunOrder: 1
    Configuration:
      Owner: MyGitHubAccountName
      Repo: MyGitHubRepositoryName
      PollForSourceChanges: 'false'
      Branch: main
      OAuthToken: '{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}'
    Name: ApplicationSource
```

JSON

{

"Name": "Source",

```
"Actions": [
        {
            "InputArtifacts": [],
            "ActionTypeId": {
                "Version": "1",
                "Owner": "ThirdParty",
                "Category": "Source",
                "Provider": "GitHub"
            },
            "OutputArtifacts": [
                {
                     "Name": "SourceArtifact"
                }
            ],
            "RunOrder": 1,
            "Configuration": {
                "Owner": "MyGitHubAccountName",
                "Repo": "MyGitHubRepositoryName",
                "PollForSourceChanges": "false",
                "Branch": "main",
                "OAuthToken":
 "{{resolve:secretsmanager:MyGitHubSecret:SecretString:token}}"
            },
            "Name": "ApplicationSource"
        }
    ]
},
```

Connecting to GitHub (OAuth)

The first time you use the console to add a GitHub repository to a pipeline, you are asked to authorize CodePipeline access to your repositories. The token requires the following GitHub scopes:

- The repo scope, which is used for full control to read and pull artifacts from public and private repositories into a pipeline.
- The admin:repo_hook scope, which is used for full control of repository hooks.

When you use the CLI or an Amazon CloudFormation template, you must provide the value for a personal access token that you have already created in GitHub.

See also

The following related resources can help you as you work with this action.

- Resource reference for the <u>Amazon CloudFormation User Guide AWS::CodePipeline::Webhook</u>

 This includes field definitions, examples, and snippets for the resource in Amazon CloudFormation.
- Resource reference for the <u>Amazon CloudFormation User Guide</u> <u>AWS::CodeStar::GitHubRepository</u> – This includes field definitions, examples, and snippets for the resource in Amazon CloudFormation.
- <u>Tutorial: Create a pipeline that builds and tests your Android app with Amazon Device Farm</u> This tutorial provides a sample build spec file and sample application to create a pipeline with a GitHub source. It builds and tests an Android app with CodeBuild and Amazon Device Farm.

Amazon CodePipeline User Guide document history

The following table describes the important changes in each release of the CodePipeline User Guide. For notification about updates to this documentation, you can subscribe to an RSS feed.

- API version: 2015-07-09
- Latest documentation update: May 23, 2025

Change	Description	Date
<u>Updated documentation for</u> <u>the EC2 deploy action deploy</u> <u>spec file</u>	Added new information about using the deploy spec file for the EC2 deploy action with updated examples and configuration options. See the action reference page at <u>Amazon EC2 action reference</u> .	May 16, 2025
Added documentation for the Lambda deploy action	Added support for the new Lambda deploy action with updated examples and configuration options. See the action reference page at <u>Amazon Lambda deploy</u> <u>action reference</u> .	May 16, 2025
Add fields to Commands action for compute type, environment type, and environment variable type	Added information about new fields that allow you to specify a build environme nt and compute type for the Commands action. A new type field for environment variables has also been added for the Commands action. See the action reference page at <u>CodePipeline Comands action</u> .	May 8, 2025

<u>New topic to document the</u> <u>default service role policy</u>	Added information about the minimum service role policy and updated the table of links to additional service role permissions for each action in CodePipeline. See the new rule reference page at <u>CodePipeline service role</u> policy.	March 26, 2025
<u>New CodePipeline invoke</u> action	Added information about the new CodePipeline invoke action. See the action reference page at <u>CodePipel</u> <u>ine invoke action reference</u> .	March 14, 2025
<u>New CodeBuild rule</u>	Added information about the new CodeBuild rule that is available to run build projects as a rule for stage conditions. See the new rule reference page at <u>CodeBuild</u> <u>rule reference</u> .	March 14, 2025
<u>Sharing connections in</u> <u>Amazon CodeConnections</u>	For pipelines with connectio ns using Amazon CodeConne ctions, you can use connectio ns configured for sharing between Amazon Web Services accounts. You can configure shared connections in Amazon Resource Access Manager. For more informati on, see <u>Use a connection</u> <u>shared with another Amazon</u> <u>Web Services account</u> .	March 6, 2025

EventBridge input transform entry for source revisions	For pipelines with CodeCommit, Amazon ECR, and Amazon S3 sources, you can use EventBridge input transform entry for source revisions, where the revisionValue is derived from the source event variable for your object key (S3), commit (CodeComm it), or image ID (ECR). See Amazon ECR source actions and EventBridge resources , Connecting to Amazon S3 source actions with a source enabled for events, and CodeCommit source actions and EventBridge.	March 3, 2025
<u>Build spec override for the</u> <u>Amazon CodeBuild action</u>	You can choose to override the build spec for the CodeBuild action while instead entering commands directly. See the action reference page at <u>Amazon</u> <u>CodeBuild build and test</u> <u>action reference</u> . Also see <u>Create a pipeline, stages, and</u> <u>actions</u> .	March 3, 2025

New EC2 deploy action	Added information about the new EC2 deploy action. See the action reference page at <u>Amazon EC2 action reference</u> . For a tutorial, see <u>Tutorial:</u> <u>Deploy to EC2 instances with</u> <u>CodePipeline</u> .	February 21, 2025
New EKS deploy action	Added information about the new EKS deploy action. See the action reference page at <u>EKS deploy action</u> . For a tutorial, see <u>Tutorial:</u> <u>Deploy to Amazon EKS with</u> <u>CodePipeline</u> .	February 20, 2025
New CloudWatch metrics and dimensions for CodePipeline	Added metrics for pipelines in CloudWatch metrics. See <u>CodePipeline CloudWatch</u> <u>metrics</u> .	February 13, 2025
<u>New Commands rule</u>	Added information about the new Commands rule that is available to run shell commands as a rule for stage conditions. See the new rule reference page at <u>Commands</u> <u>rule reference</u> .	December 17, 2024

Expanded examples and	Added descriptions for	December 17, 2024
reference information for	pull request event filters	
triggers	by provider in <u>Pull request</u> events for triggers by provider. Added expanded examples for triggers with more detailed informati on about includes and excludes in push events and pull request events in <u>Pull</u> request events for triggers by provider. Added additional JSON reference information about includes and excludes in Triggers.	
<u>New actions in the action</u> <u>catalog</u>	You can now use the ECRBuildAndPublish and InspectorScan actions. For more information, see the ECRBuildAndPublish and InspectorScan action reference pages.	November 22, 2024
New automatic configuration for stage retry on failure	You can configure a stage to automatically retry a failed stage or failed actions in the stage. For more informati on, see <u>Configure a stage for</u> <u>automatic retry on failure</u> .	October 15, 2024

<u>New Skip result for Entry</u> <u>conditions</u>	Added information about the Skip result that is available for entry conditions. You can use the VariableCheck and LambdaInvoke rules with this configuration. See the steps at <u>Creating Entry</u> <u>conditions with Skip result</u> . For a list of considerations for conditions with Skip results, see <u>Considerations for results</u> <u>configured for stage condition</u> <u>S</u> .	October 15, 2024
<u>New console steps to</u> <u>create pipelines from static</u> <u>templates</u>	In the CodePipeline console, you can use a new pipeline creation wizard to choose from multiple static templates to generate pipeline resources in Amazon CloudFormation. For more information, see <u>Create a</u> <u>pipeline from static templates</u>	October 9, 2024

•

<u>New Commands action</u>	Added information about the new Commands action that is available to run shell commands as an action in your pipeline. See the new action reference page at <u>Commands action</u> and the service role permissions at <u>Add permissions to the</u> <u>CodePipeline service role.</u> For a tutorial, see <u>Tutorial:</u> <u>Create a pipeline that runs</u> <u>commands with compute.</u>	October 3, 2024
<u>New VariableCheck rule</u> for conditions	Added information about the VariableCheck rule for stage conditions. See the new rule reference page at VariableCheck. For a tutorial, see <u>Tutorial: Create a variable</u> check rule for a pipeline as an entry condition.	September 27, 2024
<u>Updates to connections for</u> <u>GitHub</u>	Added information about using the GitHub user access token with connections to GitHub (GitHub V2 actions). User access tokens are used with CodeBuild projects. See <u>GitHub connections</u> and <u>Tutorial: Use full clone with a</u> <u>GitHub pipeline source</u> .	September 16, 2024

Updates to restructure the pipeline JSON reference and the guide table of contents	The guide has been restructu red, including some section title changes, to enhance the useability of the reference and task sections.	August 16, 2024
Update to the secret token field in the response for PutWebhook and ListWebhooks actions	The secret token field for the PutWebhook and ListWebhooks actions has been updated. If a secret token was provided, it will be redacted in the response. See the notes added to <u>Appendix A: GitHub version</u> <u>1 source actions</u> . For related updates in the <i>CodePipeline</i> <i>API Guide</i> , see <u>PutWebhook</u> and <u>ListWebhooks</u> .	August 6, 2024
Added new content for stage conditions and rules	You can now configure stage conditions and rules for V2 type pipelines. See <u>Concepts</u> , <u>How do stage condition</u> <u>s work?</u> , and <u>Configure</u> <u>conditions for a stage</u> . A reference chapter for rules has been added that provides reference information. See the <u>CodePipeline rule</u> <u>reference</u> .	July 30, 2024

Added new reference information for pipeline types and related features	A new analysis script is available for evaluating the cost for moving to V2 type pipelines. See <u>What type</u> of pipeline is right for me?. A reference table has been added that provides links across all CodePipeline service documention by feature. See the <u>CodePipeline feature</u> <u>reference</u> .	July 11, 2024
Updates to the S3 source action to add a new option for source overrides	A new option for source overrides named S3_OBJECT _KEY is available for the S3 source action. A new AllowOverrideForS3 ObjectKey parameter has been added for the S3 source action. See the <u>Amazon S3</u> <u>source action</u> reference page and <u>Start a pipeline with a</u> <u>source revision override</u> .	June 7, 2024
Updates to the S3 source action to add new output variables	New output variables named BucketName and ObjectKey are available for the S3 source action. See the <u>Amazon S3 source action</u> reference page.	June 5, 2024
Updates to the CloudForm ationStackSet and CloudFormationStac kInstances actions	The CallAs parameter was added for the CloudForm ationStackSet and CloudFormationStac kInstances action. See the <u>action reference page</u> .	May 2, 2024

<u>Support for stage-level</u> <u>rollbacks</u>	You can manually or automatically roll back a stage to a previous successfu l pipeline execution for the stage. See <u>Configuring stage</u> <u>rollback</u> and <u>Concepts</u> .	April 26, 2024
<u>Updates to Region availabil</u> ity for StackSets and Step <u>Functions actions</u>	The StackSets and Step Functions actions are now available in all Regions where CodePipeline is available. See <u>Amazon CloudFormation</u> <u>StackSets action reference</u> and <u>Amazon Step Functions</u> <u>action reference</u> .	March 27, 2024
<u>Updates to managed policy</u>	The Amazon managed policy AWSCodePipeline_Fu llAccess was updated. See <u>Amazon managed policies for</u> <u>Amazon CodePipeline</u> .	March 15, 2024
Support for configurable timeout for manual approval actions	Quota information added for new configurable timeout field for manual approval actions. For more information, see Ouotas.	February 15, 2024

Support for trigger filtering

by branches and file paths

Support for new pipeline execution modes

Updates to console pages for viewing action details, reviewing manual approval actions, and the list pipelines page Support added for trigger configuration that allows filtering on pull request status, branches, and file paths for V2 type pipelines . For more information, see <u>Filtering triggers on</u> <u>code push or pull requests</u> , <u>Triggers</u>, and <u>Filter on</u> <u>feature branches to start your</u> <u>pipeline</u>, and <u>Quotas</u>.

Support added for PARALLEL and QUEUED pipeline execution modes. For more information, see <u>Set the</u> pipeline execution mode, <u>How executions are processed</u> in QUEUED mode, <u>How</u> executions are processed in <u>PARALLEL mode</u>, and <u>Quotas</u>.

Console updates documente d for new **View details** button and dialog box, new manual approval dialog, and new columns for recent execution s on the list pipelines page. For more information, see View pipelines (console), View action details in a pipeline, and <u>Manage approval actions</u> in pipelines. February 8, 2024

February 8, 2024

January 10, 2024

<u>Support for GitLab self-mana</u> <u>ged</u>	Support added for configuri ng connections for Amazon resources to interact with GitLab self-managed. For more information, see <u>Connections for GitLab self-</u> <u>managed</u> .	December 28, 2023
Updates to the CloudForm ationStackSet and CloudFormationStac kInstances actions	The ConcurrencyMode parameter was added for the CloudFormationStac kSet and CloudForm ationStackInstance s action. See the <u>action</u> reference page.	December 19, 2023
<u>Updates to Amazon Device</u> <u>Farm action parameters in</u> <u>CodePipeline</u>	The parameters for the Amazon Device Farm action in CodePipeline have been updated. For more informati on, see <u>Amazon Device Farm</u> <u>action reference</u> .	December 18, 2023
Support added for detailed error messages for the Amazon CloudFormation action in CodePipeline	Amazon CloudFormation action error messages can now surface details about resources that failed. For more information, see <u>Amazon CloudFormation</u> <u>action reference</u> .	December 15, 2023
Updates for starting a pipeline with source revision overrides in CodePipeline	You can now start a pipeline with a specified source revision. For more informati on, see <u>Start a pipeline with a</u> <u>source revision override</u> .	November 17, 2023

<u>New supported Regions</u>	CodePipeline is now available in Asia Pacific (Hyderabad), Asia Pacific (Jakarta), Asia Pacific (Melbourne), Asia Pacific (Osaka), Middle East (UAE), Europe (Spain), and Israel (Tel Aviv) Regions. The <u>Events placeholder</u> <u>bucket reference</u> topic and <u>Amazon Web Services service</u> <u>endpoints</u> topic have been updated.	November 13, 2023
<u>Updates for event fields in</u> <u>Amazon EventBridge</u>	You can now view updated event fields in Amazon EventBridge. For more information, see <u>Monitoring</u> <u>CodePipeline events</u> .	November 9, 2023
Updates for new pipeline type V2 pipelines, triggers on Git tags, and pipeline variables in CodePipeline	You can now choose a pipeline type in CodePipel ine. For a V2 type pipeline, you can now use a trigger configuration to start your pipeline on Git tags. With V2 type pipelines, you can also use variables at the pipeline level to pass input parameters for a pipeline execution. For more informati on, see <u>Variables</u> , <u>Tutorial</u> : <u>Use pipeline-level variables</u> , and <u>Tutorial</u> : <u>Use Git tags to</u> <u>start your pipeline</u> . For more information about pipeline types, see Pipeline types.	October 24, 2023

<u>CodePipeline allows retrying</u> <u>all actions in a failed stage</u>	For a failed stage in CodePipel ine, you can retry the stage without re-running the pipeline. You do this either by retrying the failed actions in a stage or by retrying all actions in the stage starting from the first action in the stage. For more information, see.	October 17, 2023
Support for GitLab groups	Support added for configuri ng connections for Amazon resources to interact with GitLab groups. For more information, see <u>GitLab</u> <u>connections</u> .	September 15, 2023
<u>CodePipeline supports</u> <u>connections to GitLab.com</u>	You can use connections to configure Amazon resources to interact with GitLab.co m. You can also choose the full clone option for using Git commands and metadata for downstream actions. For more information, see <u>GitLab connections</u> and the <u>CodeStarSourceConnection</u> <u>action structure reference</u> topic.	August 10, 2023

<u>Update to the CloudForm</u> <u>ationStackInstances</u> action	The RegionConcurrencyT ype parameter was added for the CloudForm ationStackInstance s action. See the <u>action</u> reference page for the CloudFormationStac kInstances action.	August 8, 2023
<u>Update to the CloudForm</u> ationStackSet action	The RegionConcurrencyT ype parameter was added for the CloudForm ationStackSet action. See the <u>action reference</u> page for the CloudForm ationStackSet action.	July 24, 2023
Updates to managed policy	The Amazon managed policy AWSCodePipeline_Fu llAccess was updated. See <u>Amazon managed policies for</u> <u>Amazon CodePipeline</u> .	June 21, 2023
Updates to migration procedures for polling pipelines	The procedures to migrate (update) polling pipelines to use event-based change detection have been updated with the steps for pipelines that use an Amazon S3 bucket enabled for notifications to EventBridge. For more information, see <u>Migrate</u> polling pipelines to use event- based change detection.	June 12, 2023

<u>Updates to managed policies</u>	The Amazon managed policies AWSCodePi peline_FullAccess and AWSCodePipeline_Re adOnlyAccess have been updated with an additiona l permission. For more information, see <u>Amazon</u> <u>CodePipeline updates to</u> <u>Amazon managed policies</u> .	May 16, 2023
<u>Updates to managed policies</u>	The Amazon managed policies AWSCodePi pelineFullAccess and AWSCodePipelineRea dOnlyAccess are deprecated. Use the AWSCodePipeline_Fu llAccess and AWSCodePi peline_ReadOnlyAcc ess policies. See Amazon CodePipeline updates to Amazon managed policies.	November 17, 2022

Updates to procedures that use CloudTrail	All console procedures, sample CLI commands, and sample Amazon CloudForm ation snippets and templates for a pipeline with an S3 source have been updated with the option to choose Write and select false for Management events in CloudTrail. See the updated samples in <u>Starting a pipeline</u> , <u>Tutorial: Create a pipeline</u> with Amazon CloudForm ation, <u>Edit pipelines to use</u> push events, and <u>Update</u> polling pipelines.	April 27, 2022
<u>New supported integration</u> <u>with Snyk</u>	You can use the Snyk invoke action in CodePipeline to automate security scanning for your open source code. For more information, refer to the <u>Snyk action reference</u> and <u>Integrations</u> .	June 10, 2021
<u>New supported Region</u> Europe (Milan)	CodePipeline is now available in Europe (Milan). The <u>Limits</u> topic and <u>Amazon Web</u> <u>Services service endpoints</u> topic have been updated.	January 27, 2021

User Guide

Change detection can be turned off for source actions with connections

CodePipeline now supports Amazon CloudFormation StackSets deployment actions

New supported Region Asia Pacific (Hong Kong) You can use the CLI or SDK to update a CodeStarS ourceConnection source action to turn off automatic change detection for the source repository. The <u>CodeStarSourceConnection</u> action structure reference topic has been updated with a description for the DetectChanges parameter.

A new tutorial, <u>Tutorial:</u> <u>Create a pipeline that uses</u> <u>Amazon CloudFormation</u> <u>StackSets as a deploymen</u> <u>t provider</u>, provides steps to use Amazon CloudForm ation StackSets to create and update your stack sets and stack instances with your pipeline. The <u>Amazon</u> <u>CloudFormation StackSets</u> <u>action structure reference</u> topic has also been added.

CodePipeline is now available in Asia Pacific (Hong Kong). The <u>Limits</u> topic and <u>Amazon</u> <u>Web Services service</u> <u>endpoints</u> topic have been updated. January 8, 2021

December 30, 2020

December 22, 2020

<u>View updated EventBridge</u> <u>event patterns in CodePipel</u> <u>ine</u>	Updated event patterns and statuses for pipeline, stage, and action level events have been added to <u>Monitoring</u> <u>CodePipeline events</u> .	December 21, 2020
<u>View inbound pipeline</u> <u>executions in CodePipeline</u>	You can use the console or the CLI to view inbound executions. For more information, see <u>View an</u> <u>inbound execution (console)</u> and <u>View inbound execution</u> <u>status (CLI)</u> .	November 16, 2020
<u>The CodeCommit source</u> <u>action in CodePipeline</u> <u>supports the full clone option</u>	When you use a CodeCommit source action, you can choose the full clone option for using Git commands and metadata for downstream CodeBuild actions. For more information, see the <u>CodeCommit action</u> <u>reference</u> and <u>Tutorial: Use</u> <u>full clone with a CodeCommit</u> <u>pipeline source</u> .	November 11, 2020

<u>CodePipeline supports</u> <u>connections to GitHub and</u> <u>GitHub Enterprise Server</u>

The CodeBuild action supports enabling batch builds in Amazon CodePipel ine You can use connections to configure Amazon resources to interact with GitHub, GitHub Enterprise Cloud, and GitHub Enterprise Server. You can also choose the full clone option for using Git commands and metadata for downstream actions. For more information, see GitHub connections, GitHub Enterpris e Server connections, and Tutorial: Use full clone with a GitHub pipeline source. If you have an existing pipeline with a GitHub source action, see Update a GitHub (via OAuth app) source action to a GitHub (via GitHub App) source action.

For CodeBuild actions in

your pipeline, you can enable

batch builds to run multiple builds in a single execution

. For more information, see CodeBuild action structure

reference and Create a

pipeline (console).

September 30, 2020

July 30, 2020

Amazon CodePipeline now supports Amazon AppConfig deployment actions	A new tutorial, <u>Tutorial</u> : <u>Create a pipeline that uses</u> <u>Amazon AppConfig as</u> <u>a deployment provider</u> , provides steps to use Amazon AppConfig to deploy configuration files with your pipeline. The <u>Amazon</u> <u>AppConfig action structure</u> <u>reference</u> topic has also been added.	June 25, 2020
<u>Amazon CodePipeline now</u> <u>supports Amazon VPC in</u> <u>Amazon GovCloud (US-West)</u>	You can now connect directly to Amazon CodePipeline through a private Amazon VPC endpoint in Amazon GovCloud (US-West). For more information, see <u>Use</u> <u>CodePipeline with Amazon</u> <u>Virtual Private Cloud</u> .	June 2, 2020
Amazon CodePipeline now supports Amazon Step Functions invoke actions	You can now create a pipeline in CodePipeline that uses Amazon Step Functions as the invoke action provider. A new tutorial, <u>Tutorial: Use</u> an Amazon Step Functions invoke action in a pipeline, provides steps for starting a state machine execution from your pipeline. The <u>Amazon Step Functions</u> <u>Action Structure Reference</u> topic has also been added.	May 28, 2020

View, list, and update connections	You can list, delete, and update connections in the console. See <u>List connections</u> <u>in CodePipeline</u> .	May 21, 2020
<u>Connections support tagging</u> <u>connections resources in the</u> <u>CLI</u>	The connections resources now support tagging in the Amazon CLI. Connections now integrate with Amazon CodeGuru. See <u>IAM Permissio</u> <u>ns Reference for Connections</u> .	May 6, 2020
<u>CodePipeline is now available</u> in Amazon GovCloud (US- West)	You can now use CodePipel ine in Amazon GovCloud (US- West). For more information, see <u>Quotas</u> .	April 8, 2020
<u>The quotas topic shows which</u> <u>CodePipeline service quotas</u> <u>are configurable</u>	The CodePipeline quotas topic has been reformatt ed. The documentation shows which service quotas are configurable and which quotas are non-configurable. See <u>Quotas in Amazon</u> <u>CodePipeline</u> .	March 12, 2020
The Amazon ECS deployment action timeout is configurable	The Amazon ECS deployment action timeout is configurable up to one hour (the default timeout). See <u>Quotas in</u> <u>Amazon CodePipeline</u> .	February 5, 2020

<u>New topics describe how you</u> can stop a pipeline execution	You can stop a pipeline execution in CodePipeline. You can either specify that the execution stops after in- progress actions are allowed to complete, or you can specify to stop the execution immediately and abandon in-progress actions. See <u>How pipeline executions are</u> <u>stopped</u> and <u>Stop a pipeline</u> <u>execution in CodePipeline</u> .	January 21, 2020
<u>CodePipeline supports</u> <u>connections</u>	You can use connections to configure Amazon resources to interact with external code repositories. Each connection is a resource that can be used by services such as CodePipel ine to connect to a third-party repository, such as Bitbucket Cloud. For more information, see <u>Working with connections</u> in CodePipeline.	December 18, 2019
Updated security, authentic ation, and access control topics	The security, authentication, and access control informati on for CodePipeline has been organized into a new Security chapter. For more informati on, see Security.	December 17, 2019

November 14, 2019

New topics describe how you can use variables in your pipelines

New topics describe how pipeline executions work, why stages are locked during an execution, and when pipeline executions are superseded

CodePipeline supports notification rules

You can now configure namespaces for actions and generate variables each time the action execution is complete. You can set up downstream actions to reference these namespace s and variables. See <u>Working</u> with variables and Variables.

A number of topics have been added to the Welcome section to describe how pipeline executions work, including why stages are locked during an execution and what happens when pipeline executions are supersede d. These topics include a list of concepts, a DevOps workflow example, and recommendations for how a pipeline should be structure d. The following topics have been added: Pipeline terms, DevOps pipeline example, and How pipeline executions work.

You can now use notificat ion rules to notify users of important changes in pipelines. For more informati on, see <u>Create a notification</u> rule. November 5, 2019

November 11, 2019

API Version 2015-07-09 1325

<u>CodeBuild environme</u> <u>nt variables available in</u> <u>CodePipeline</u>	You can set CodeBuild environment variables in the CodeBuild build action for your pipeline. You can use the console or CLI to add the EnvironmentVariables parameter to the pipeline structure. The <u>Create a</u> pipeline (console) topic has been updated. The action configuration examples in the action reference for <u>CodeBuild</u> have also been updated.	October 14, 2019
<u>New Region</u>	CodePipeline is now available in Europe (Stockholm). The Limits topic and Amazon Web Services service endpoints topic have been updated.	September 5, 2019
Specify canned ACLs and cache control for Amazon S3 deployment actions	You can now specify canned ACL and cache control options when you create an Amazon S3 deployment action in CodePipeline. The following topics have been updated: Create a pipeline (console) , CodePipeline Pipeline structure reference, and Tutorial: Create a pipeline that uses Amazon S3 as a deployment provider.	June 27, 2019

You can now add tags to resources in Amazon CodePipeline

You can now view action execution history in Amazon CodePipeline You can now use tagging to track and manage Amazon CodePipeline resources such as pipelines, custom actions, and webhooks. The following new topics have been added: Tagging resources, Using tags to control access to CodePipel ine resources, Tag a pipeline in CodePipeline, Tag a custom action in CodePipeline, and Tag a webhook in CodePipel ine. The following topics have been updated to show how to use the CLI to tag resources: Create a pipeline (CLI), Create a custom action (CLI), and Create a webhook for a GitHub source.

You can now view details about past executions of all actions in a pipeline. These details include start and end times, duration, action execution ID, status, input and output artifact location details, and external resource details. The <u>View pipeline</u> <u>details and history</u> topic has been updated to reflect this support. May 15, 2019

March 20, 2019

Amazon CodePipeline now supports publishing applicati ons to the Amazon Serverless Application Repository

Amazon CodePipeline now supports cross-region actions in the console You can now create a pipeline in CodePipeline that publishes your serverless application to the Amazon Serverles s Application Repository. A new tutorial, <u>Tutorial:</u> <u>Publish applications to the</u> <u>Amazon Serverless Applicati</u> <u>on Repository</u>, provides steps for creating and configuri ng a pipeline to continuou sly deliver your serverless application to the Amazon Serverless Application Repository.

You can now manage crossregion actions in the Amazon CodePipeline console. Add a cross-Region action has been updated with the steps to add, edit, or delete an action that is in a different Amazon Region from your pipeline. The <u>Create a pipeline</u>, Edit a pipeline, and <u>CodePipeline</u> pipeline structure reference topics have been updated. February 14, 2019

March 8, 2019

Amazon CodePipeline now supports Amazon S3 deployments

Amazon CodePipeline now supports Alexa Skills Kit deployments

You can now create a pipeline in CodePipeline that uses Amazon S3 as the deploymen t action provider. A new tutorial, <u>Tutorial: Create a</u> <u>pipeline that uses Amazon</u> S3 as a deployment provider, provides steps for deploying sample files to your Amazon S3 bucket with CodePipeline. The <u>CodePipeline pipeline</u> <u>structure reference</u> topic has also been updated.

You can now use CodePipel ine and Alexa Skills Kit for continuous deployment of Alexa skills. A new tutorial, Tutorial: Create a pipeline that deploys an Amazon Alexa skill, contains steps for creating credentials that allow Amazon CodePipel ine to connect to your Alexa Skills Kit developer account and then creating a pipeline that deploys a sample skill. The CodePipeline pipeline structure reference topic has been updated.

January 16, 2019

December 19, 2018

User Guide

Amazon CodePipeline now supports Amazon VPC endpoints powered by Amazon PrivateLink

Amazon CodePipeline now supports Amazon ECR source actions and ECS-to-Co deDeploy deployment actions You can now connect directly to Amazon CodePipeline through a private endpoint in your VPC, keeping all traffic inside your VPC and the Amazon network. For more information, see <u>Use</u> <u>CodePipeline with Amazon</u> <u>Virtual Private Cloud</u>.

You can now use CodePipel ine and CodeDeploy with Amazon ECR and Amazon ECS for continuous deployment of container-based applicati ons. A new tutorial, Create a pipeline with an Amazon ECR source and ECS-to-CodeDeploy deployment, contains steps for using the console to create a pipeline that deploys container applications stored in an image repository to an Amazon ECS cluster with CodeDeploy traffic routing. The Create a pipeline and CodePipeline pipeline structure reference topics have been updated.

November 27, 2018

December 6, 2018

Amazon CodePipeline now A new topic, Add a Cross-reg supports cross-region actions ion Action, contains steps for using the Amazon CLI in a pipeline or Amazon CloudFormation to add an action that is in a different region from your pipeline. The Create a pipeline, Edit a pipeline, and CodePipeline pipeline structure reference topics have been updated. Amazon CodePipeline now You can now add Service October 16, 2018 integrates with Service Catalog as a deploymen Catalog t action to your pipeline. This allows you to set up a pipeline to publish product updates to Service Catalog when you make a change in your source repository. The Integrations topic has been updated to reflect this support for Service Catalog. Two Service Catalog tutorials have been added to the Amazon CodePipeline tutorials section.

November 12, 2018

API Version 2015-07-09 1331

Amazon CodePipeline now You can now add Amazon July 19, 2018 integrates with Amazon Device Farm as a test action to your pipeline. This allows **Device Farm** you to set up a pipeline to test mobile applications. The Integrations topic has been updated to reflect this support for Amazon Device Farm. Two Amazon Device Farm tutorials have been added to the Amazon CodePipeline tutorials section. Amazon CodePipeline User The HTML version of the June 30, 2018 Guide update notifications CodePipeline User Guide now available through RSS now supports an RSS feed of updates that are documente d in the Documentation Update History page. The **RSS** feed includes updates made after June 30, 2018 and later. Previously announced updates are still available in the Documentation Update History page. Use the RSS

Earlier updates

The following table describes important changes in each release of the CodePipeline User Guide on June 30, 2018 and earlier.

button in the top menu panel

to subscribe to the feed.

Change	Description	Date changed
Use webhooks to detect source changes in GitHub pipelines	When you create or edit a pipeline in the console, CodePipeline now creates a webhook that detects changes to your GitHub source repository and then starts your pipeline. For information about migrating your pipeline, see <u>Configure Your GitHub Pipelines to Use</u> <u>Webhooks for Change Detection</u> . For more information, see <u>Start a Pipeline Execution in CodePipeline</u> .	May 1, 2018
Updated topics	 When you create or edit a pipeline in the console, CodePipeline now creates an Amazon CloudWatch Events rule and an Amazon CloudTrail trail that detects changes to your Amazon S3 source bucket and then starts your pipeline. For information about migrating your pipeline, see <u>Source actions and change detection methods</u>. The <u>Tutorial: Create a simple pipeline (S3 bucket)</u> has been updated to show how the Amazon CloudWatch Events rule and trail are created when you select an Amazon S3 source. <u>Create a pipeline, stages, and actions and Edit a pipeline in CodePipeline</u> have also been updated. For more information, see <u>Start a pipeline in CodePipel ine</u>. 	March 22, 2018
Updated topic	CodePipeline is now available in Europe (Paris). The Quotas in Amazon CodePipeline topic has been updated.	February 21, 2018
Updated topics	You can now use CodePipeline and Amazon ECS for continuous deployment of container-based applicati ons. When you create a pipeline, you can select Amazon ECS as a deployment provider. A change to code in your source control repository triggers your pipeline to build a new Docker image, push it to your container registry,	December 12, 2017

Change	Description	Date changed
	and then deploy the updated image to an Amazon ECS service.	
	The topics <u>Product and service integrations with</u> <u>CodePipeline</u> , <u>Create a pipeline</u> , <u>stages</u> , <u>and actions</u> , and <u>CodePipeline pipeline structure reference</u> have been updated to reflect this support for Amazon ECS.	
Updated topics	 When you create or edit a pipeline in the console, CodePipeline now creates an Amazon CloudWatch Events rule that detects changes to your CodeCommit repository and then automatically starts your pipeline. For informati on about migrating your existing pipeline, see <u>Source actions and change detection methods</u>. The <u>Tutorial: Create a simple pipeline (CodeCommit repository</u>) has been updated to show how the Amazon CloudWatch Events rule and role are created when you select a CodeCommit repository and branch. <u>Create a pipeline, stages, and actions</u> and <u>Edit a pipeline in CodePipeline</u> have also been updated. For more information, see <u>Start a pipeline in CodePipeline ine</u>. 	October 11, 2017
New and updated topics	CodePipeline now provides built-in support for pipeline state change notifications through Amazon CloudWatch Events and Amazon Simple Notification Service (Amazon SNS). A new tutorial <u>Tutorial: Set up a CloudWatch Events</u> <u>rule to receive email notifications for pipeline state</u> <u>changes</u> has been added. For more information, see <u>Monitoring CodePipeline events</u> .	September 8, 2017

Change	Description	Date changed
New and updated topics	You can now add CodePipeline as a target for Amazon CloudWatch Events actions. Amazon CloudWatch Events rules can be set up to detect source changes so that the pipeline starts as soon as those changes occur, or they can be set up to run scheduled pipeline executions. Informati on has been added for the PollForSourceChanges source action configuration option. For more information, see <u>Start a pipeline in CodePipeline</u> .	September 5, 2017
New Regions	CodePipeline is now available in Asia Pacific (Seoul) and Asia Pacific (Mumbai). The <u>Quotas in Amazon CodePipel</u> <u>ine</u> topic and <u>Regions and Endpoints</u> topic have been updated.	July 27, 2017
New Regions	CodePipeline is now available in US West (N. California), Canada (Central), and Europe (London). The <u>Quotas in</u> <u>Amazon CodePipeline</u> topic and <u>Regions and Endpoints</u> topic have been updated.	June 29, 2017
Updated topics	You can now view details about past executions of a pipeline, not just the most recent execution. These details include start and end times, duration, and execution ID. Details are available for a maximum of 100 pipeline executions during the most recent 12-month period. The topics <u>View pipelines and details in CodePipeline</u> , <u>CodePipeline permissions reference</u> , and <u>Quotas in</u> <u>Amazon CodePipeline</u> have been updated to reflect this support.	June 22, 2017
Updated topic	Nouvola has been added to the list of available actions in <u>Test action integrations</u> .	May 18, 2017

Change	Description	Date changed
Updated topics	In the Amazon CodePipeline wizard, the page Step 4: Beta has been renamed Step 4: Deploy . The default name of the stage created by this step has been changed from "Beta" to "Staging". Numerous topics and screenshots have been updated to reflect these changes.	April 7, 2017
Updated topics	You can now add Amazon CodeBuild as a test action to any stage of a pipeline. This allows you to more easily use Amazon CodeBuild to run unit tests against your code. Prior to this release, you could use Amazon CodeBuild to run unit tests only as part of a build action. A build action requires a build output artifact, which unit tests typically do not produce. The topics <u>Product and service integrations with</u> <u>CodePipeline, Edit a pipeline in CodePipeline</u> , and <u>CodePipeline pipeline structure reference</u> have been	March 8, 2017
New and updated topics	updated to reflect this support for Amazon CodeBuild. The table of contents has been reorganized to include sections for pipelines, actions, and stage transitions. A new section has been added for CodePipeline tutorials. For better usability, <u>Product and service integrations with</u> <u>CodePipeline</u> has been divided into shorter topics. A new section, Authorization and Access Control, provides comprehensive information about using <u>Amazon Identity</u> <u>and Access Management (IAM)</u> and CodePipeline to help secure access to your resources through the use of credentials. These credentials provide the permissions required to access Amazon resources, such as putting and retrieving artifacts from Amazon S3 buckets and integrati ng Amazon OpsWorks stacks into your pipelines.	February 8, 2017

Change	Description	Date changed
New Region	CodePipeline is now available in Asia Pacific (Tokyo). The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions and</u> <u>Endpoints</u> topic have been updated.	December 14, 2016
New Region	CodePipeline is now available in South America (São Paulo). The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions and Endpoints</u> topic have been updated.	December 7, 2016
Updated topics	You can now add Amazon CodeBuild as a build action to any stage of a pipeline. Amazon CodeBuild is a fully managed build service in the cloud that compiles your source code, runs unit tests, and produces artifacts that are ready to deploy. You can use an existing build project or create one in the CodePipeline console. The output of the build project can then be deployed as part of a pipeline. The topics Product and service integrations with CodePipeline, Create a pipeline, stages, and actions, Authentication and Access Control, and CodePipeline pipeline structure reference have been updated to reflect this support for Amazon CodeBuild. You can now use CodePipeline with Amazon CloudForm ation and the Amazon Serverless Application Model to continuously deliver your serverless applications. The topic Product and service integrations with CodePipeline has been updated to reflect this support. Product and service integrations with CodePipeline has been reorganized to group Amazon and partner offerings by action type.	December 1, 2016

Change	Description	Date changed
New Region	CodePipeline is now available in Europe (Frankfurt). The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions and</u> <u>Endpoints</u> topic have been updated.	November 16, 2016
Updated topics	Amazon CloudFormation can now be selected as a deployment provider in pipelines, enabling you to take action on Amazon CloudFormation stacks and change sets as part of a pipeline execution. The topics <u>Product</u> and service integrations with CodePipeline, Create a pipeline, stages, and actions, Authentication and Access Control, and <u>CodePipeline pipeline structure reference</u> have been updated to reflect this support for Amazon CloudFormation.	November 3, 2016
New Region	CodePipeline is now available in the Asia Pacific (Sydney) Region. The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions and Endpoints</u> topic have been updated.	October 26, 2016
New Region	CodePipeline is now available in Asia Pacific (Singapore). The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions</u> and <u>Endpoints</u> topic have been updated.	October 20, 2016
New Region	CodePipeline is now available in the US East (Ohio) Region. The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions and Endpoints</u> topic have been updated.	October 17, 2016
Updated topic	<u>Create a pipeline, stages, and actions</u> has been updated to reflect support for displaying version identifiers of custom actions in the Source provider and Build provider lists.	September 22, 2016
Updated topic	The <u>Add a manual approval action to a stage</u> section has been updated to reflect an enhancement that lets Approval action reviewers open the Approve or reject the revision form directly from an email notification.	September 14, 2016

Amazon CodePipeline

Change	Description	Date changed
New and updated topics	A new topic that describes how to view details about code changes currently flowing through your software release pipeline. Quick access to this information can be useful when reviewing manual approval actions or troublesh ooting failures in your pipeline. A new section, <u>Monitoring pipelines</u> , provides a central location for all topics related to monitoring the status and progress of your pipelines.	September 08, 2016
New and updated topics	A new section, <u>Add a manual approval action to a</u> <u>stage</u> , provides information about configuring and using manual approval actions in pipelines. Topics in this section provide conceptual information about the approval process; instructions for setting up required IAM permissions, creating approval actions, and approving or rejecting approval actions; and samples of the JSON data generated when an approval action is reached in a pipeline.	July 06, 2016
New Region	CodePipeline is now available in the Europe (Ireland) Region. The <u>Quotas in Amazon CodePipeline</u> topic and <u>Regions and endpoints</u> topic have been updated.	June 23, 2016
New topic	A new topic, , has been added to describe how to retry a failed action or a group of parallel failed actions in stage.	June 22, 2016

Change	Description	Date changed
Updated topics	A number of topics, including <u>Create a pipeline, stages</u> , and actions, Authentication and Access Control, <u>CodePipel</u> ine pipeline structure reference, and <u>Product and service</u> integrations with <u>CodePipeline</u> , have been updated to reflect support for configuring a pipeline to deploy code in conjunction with custom Chef cookbooks and applicati ons created in Amazon OpsWorks. CodePipeline support for Amazon OpsWorks is currently available in the US East (N. Virginia) Region (us-east-1) only.	June 2, 2016
New and updated topics	A new topic, <u>Tutorial: Create a simple pipeline</u> (CodeCommit repository), has been added. This topic provides a sample walkthrough showing how to use a CodeCommit repository and branch as the source location for a source action in a pipeline. Several other topics have been updated to reflect this integration with CodeCommit, including Authentication and Access Control, <u>Product and service integrations with CodePipel</u> <u>ine</u> , <u>Tutorial: Create a four-stage pipeline</u> , and <u>Troublesh</u> <u>ooting CodePipeline</u> .	April 18, 2016
New topic	A new topic, <u>Invoke an Amazon Lambda function in a</u> <u>pipeline in CodePipeline</u> , has been added. This topic contains sample Amazon Lambda functions and steps for adding Lambda functions to pipelines.	January 27, 2016
Updated topic	A new section has been added to Authentication and Access Control, Resource-based Policies.	January 22, 2016
New topic	A new topic, <u>Product and service integrations with</u> <u>CodePipeline</u> , has been added. Information about integrations with partners and other Amazon Web Services services has been moved to this topic. Links to blogs and videos have also been added.	December 17, 2015

Change	Description	Date changed
Updated topic	Details of integration with Solano CI have been added to <u>Product and service integrations with CodePipeline</u> .	November 17, 2015
Updated topic	The CodePipeline Plugin for Jenkins is now available through the Jenkins Plugin Manager as part of the library of plugins for Jenkins. The steps for installing the plugin have been updated in <u>Tutorial: Create a four-stage</u> <u>pipeline</u> .	November 9, 2015
New Region	CodePipeline is now available in the US West (Oregon) Region. The <u>Quotas in Amazon CodePipeline</u> topic has been updated. Links have been added to <u>Regions and</u> <u>Endpoints</u> .	October 22, 2015
New topic	Two new topics, <u>Configure server-side encryption for</u> artifacts stored in Amazon S3 for CodePipeline and <u>Create a pipeline in CodePipeline that uses resources</u> from another Amazon account, have been added. A new section has been added to Authentication and Access Control, <u>Example 8: Use Amazon resources associated</u> with another account in a pipeline.	August 25, 2015
Updated topic	The <u>Create and add a custom action in CodePipeline</u> topic has been updated to reflect changes in the structure, including inputArtifactDetails and outputArt ifactDetails .	August 17, 2015
Updated topic	The <u>Troubleshooting CodePipeline</u> topic has been updated with revised steps for troubleshooting problems with the service role and Elastic Beanstalk.	August 11, 2015
Updated topic	The Authentication and Access Control topic has been updated with the latest changes to the <u>service role for</u> <u>CodePipeline</u> .	August 6, 2015

Change	Description	Date changed
New topic	A <u>Troubleshooting CodePipeline</u> topic has been added. Updated steps have been added for IAM roles and Jenkins in <u>Tutorial: Create a four-stage pipeline</u> .	July 24, 2015
Topic update	Updated steps have been added for downloading the sample files in <u>Tutorial: Create a simple pipeline (S3 bucket)</u> and <u>Tutorial: Create a four-stage pipeline</u> .	July 22, 2015
Topic update	A temporary workaround for download issues with the sample files was added in <u>Tutorial: Create a simple pipeline (S3 bucket)</u> .	July 17, 2015
Topic update	A link was added in <u>Quotas in Amazon CodePipeline</u> to point to information about which limits can be changed.	July 15, 2015
Topic update	The managed policies section in Authentication and Access Control was updated.	July 10, 2015
Initial Public Release	This is the initial public release of the CodePipeline User Guide.	July 9, 2015

CodePipeline feature reference

This section is a high-level reference for features in CodePipeline documentation. For a conceptual overview of the pipeline structure, see CodePipeline pipeline structure reference.

This table is updated periodically with feature reference information.

Date of table update	Feature	CodePipeline User Guide	CodePipeline API Guide	Amazon CloudForm ation Reference	Amazon CDK Reference - L1 construct s
October 15, 2024	Automatic retry on stage failure	Configure a stage for automatic retry on failure	RetryConf iguration		
October 15, 2024	Skip result for beforeEnt ry conditions	Creating Entry condition s with Skip result and VariableC heck rule (console)	FailureCo nditions		
October 03, 2024	Commands action with new Compute category	Commands action reference	ActionDec laration		
August 28, 2024	beforeEnt ry type for stage conditions	Configure conditions for a stage	<u>BeforeEnt</u> ryConditions	AWS::Code Pipeline: :Pipeline	<u>beforeEntry</u>

Date of table update	Feature	CodePipeline User Guide	CodePipeline API Guide	Amazon CloudForm ation Reference	Amazon CDK Reference - L1 construct s
				BeforeEnt ryConditions	
August 28, 2024	onSuccess type for stage conditions	Configure conditions for a stage	SuccessCo nditions	AWS::Code Pipeline: :Pipeline SuccessCo nditions	<u>onSuccess</u>
April 26, 2024	Stage rollbacks and onFailure type for stage conditions	<u>Configuri</u> ng stage rollback	<u>RollbackS</u> <u>tage</u>	<u>onFailure</u>	<u>onFailure</u>
February 08, 2024	PARALLEL and QUEUED execution modes	Set or change the pipeline execution mode	PipelineE xecution	Execution Mode	Execution mode
November 17, 2023	Source overrides	Start a pipeline with a source revision override	SourceRev isionOverride	N/A	N/A
October 24, 2023	Pipeline types	What type of pipeline is right for me?	PipelineD eclaration	<u>PipelineType</u>	<u>enum</u> PipelineType

Date of table update	Feature	CodePipeline User Guide	CodePipeline API Guide	Amazon CloudForm ation Reference	Amazon CDK Reference - L1 construct s
October 24, 2023	Pipeline-level variables	<u>Tutorial: Use</u> pipeline-level variables	<u>PipelineV</u> ariable	AWS::Code Pipeline: :Pipeline VariableD eclaration	<u>Pipeline-level</u> <u>variables</u>
October 24, 2023	Triggers and filtering file paths / branches / pull requests	Automate starting pipelines using triggers and filtering Tutorial: Filter on branch names for pull requests to start your pipeline (V2 type)	ActionDec laration	AWS::Code Pipeline: :Pipeline PipelineT riggerDec laration	<u>Trigger</u>
October 17, 2023	Retry a stage	Configuring stage retry for a failed stage or failed actions	ActionDec laration	N/A	N/A