

# AWS CICD

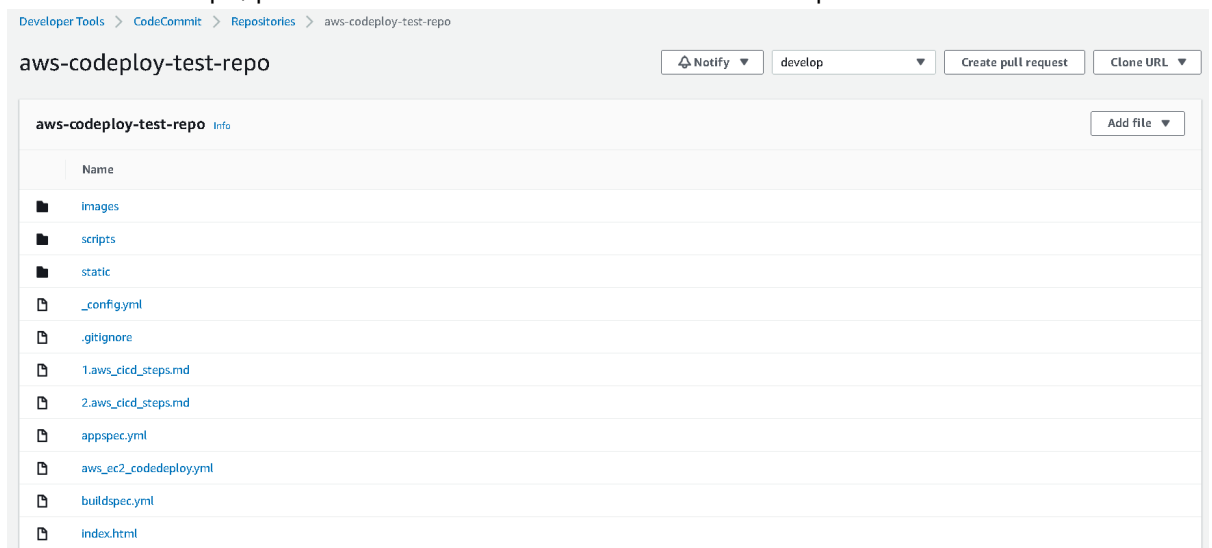
- [AWS CICD](#)
  - [Orchestrate pipeline using CodeCommit,Codebuild,CodeDeploy and CodePipeline](#)
    - [Creating CICD Resources \( Continuous Deployment \)](#)
      - [Creating Dev Deployment Pipeline](#)
    - [Testing the Pipeline Executions](#)
    - [Launching Dev and Prod EC2 instances](#)
    - [Creating Prod Deployment Pipeline](#)
- [Reference](#)

Orchestrate pipeline using CodeCommit,Codebuild,CodeDeploy and CodePipeline

## Creating CICD Resources ( Continuous Deployment )

### Creating Dev Deployment Pipeline

- Create below resources:
  - Configure CodeCommit IAM [https](#) credentials.
  - Download the Source Code from <https://aws-codedeploy-test-bucket.s3.ap-south-1.amazonaws.com/aws-codedeploy-repo.zip> and unzip the file and Create/Use existing CodeCommit Repo, push the source code files to Codecommit Repo into **master** branch.



- First for above setup, using CodeDeploy, we will first have our Code in CodeCommit.
- CodeBuild Execution and CodeDeploy Application is started manually, so CodePipeline trigger/start existing Build Project and CodeDeploy Application.
- Create a new AWS CodePipeline:
  - Navigate to [AWS CodePipeline > Pipeline](#) and click [Create pipeline > dev-deployment-pipeline](#)
  - CodePipeline will create a [IAM Service Role](#) which will have access [CodeCommit Pull](#), [CodeBuild Execution](#), [start deploy access](#)

Developer Tools > CodePipeline > Pipelines > Create new pipeline

Step 1  
**Choose pipeline settings**

Step 2  
Add source stage

Step 3  
Add build stage

Step 4  
Add deploy stage

Step 5  
Review

## Choose pipeline settings [Info](#)

### Pipeline settings

**Pipeline name**  
Enter the pipeline name. You cannot edit the pipeline name after it is created.

dev-ec2-deployment-codepipeline

No more than 100 characters

**Service role**

☒ **New service role**  
Create a service role in your account

☐ **Existing service role**  
Choose an existing service role from your account

**Role name**

AWSCodePipelineServiceRole-ap-south-1-dev-ec2-deployment-codepi

Type your service role name

☒ Allow AWS CodePipeline to create a service role so it can be used with this new pipeline

► **Advanced settings**

Cancel **Next**

- Input the name for the service for CodePipeline and the S3 bucket that holds the artifacts for this pipeline.
- Add a source stage such as **CodeCommit repository** and **branch** on which code version you want to deploy.
- For **dev** pipeline, **develop** branch can be used.

Developer Tools > CodePipeline > Pipelines > Create new pipeline

Step 1  
[Choose pipeline settings](#)

Step 2  
**Add source stage**

Step 3  
Add build stage

Step 4  
Add deploy stage

Step 5  
Review

## Add source stage [Info](#)

### Source

**Source provider**  
This is where you stored your input artifacts for your pipeline. Choose the provider and then provide the connection details.

AWS CodeCommit

**Repository name**  
Choose a repository that you have already created where you have pushed your source code.

aws-codedeploy-test-repo

**Branch name**  
Choose a branch of the repository

develop

**Change detection options**  
Choose a detection mode to automatically start your pipeline when a change occurs in the source code.

☒ **Amazon CloudWatch Events (recommended)**  
Use Amazon CloudWatch Events to automatically start my pipeline when a change occurs

☐ **AWS CodePipeline**  
Use AWS CodePipeline to check periodically for changes

**Output artifact format**  
Choose the output artifact format.

☒ **CodePipeline default**  
AWS CodePipeline uses the default zip format for artifacts in the pipeline. Does not include git metadata about the repository.

☐ **Full clone**  
AWS CodePipeline passes metadata about the repository that allows subsequent actions to do a full git clone. Only supported for AWS CodeBuild actions.

Cancel Previous **Next**

- Skip the CodeBuild as of now.
- Add a deploy stage using **AWS CodeDeploy**. Select the CodeDeploy Application name that we have already created, and select the **DevEC2DeploymentGroup**

Developer Tools > CodePipeline > Pipelines > Create new pipeline

Step 1  
[Choose pipeline settings](#)

Step 2  
[Add source stage](#)

Step 3  
[Add build stage](#)

Step 4  
**Add deploy stage**

Step 5  
[Review](#)

## Add deploy stage [Info](#)

**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.

### Deploy

**Deploy provider**  
Choose how you deploy to instances. Choose the provider, and then provide the configuration details for that provider.

AWS CodeDeploy

**Region**  
Asia Pacific (Mumbai)

**Application name**  
Choose an application that you have already created in the AWS CodeDeploy console. Or create an application in the AWS CodeDeploy console and then return to this task.

codedeploy-demo-application-testing-mumbai

**Deployment group**  
Choose a deployment group that you have already created in the AWS CodeDeploy console. Or create a deployment group in the AWS CodeDeploy console and then return to this task.

DevEC2DeploymentGroup

Cancel Previous **Next**

- Review the Stages and select **Create Pipeline**.
- First time when pipeline is created , it will run automatically.

dev-deployment-pipeline-mumbai [Notify](#) [Edit](#) [Stop execution](#) [Clone pipeline](#) [Release change](#)

**Source** Succeeded  
Pipeline execution ID: f5e4953d-caa0-45b1-9c27-8eae31d06c3f

Source  
AWS CodeCommit  
Succeeded - 7 minutes ago  
47796e0e

47796e0e Source: modify readme files

[Disable transition](#)

**Deploy** Succeeded  
Pipeline execution ID: f5e4953d-caa0-45b1-9c27-8eae31d06c3f

Deploy  
AWS CodeDeploy  
Succeeded - 6 minutes ago  
[Details](#)

47796e0e Source: modify readme files

- Pipeline can be triggered manually by selecting the **Release Change**.
  - All Stages in a CodePipeline will be executed with new Execution ID
- A **Cloudwatch Event Rule** with similar name `codepipeline-awscod-develo-497863-rule` is created in the background that will trigger the CodePipeline automatically when there is any change in specified branch of CodeCommit Repo. - Navigate and view the CloudWatch Event.

- Event Pattern will be as below:

```
{
  "source": ["aws.codecommit"],
  "detail-type": ["CodeCommit Repository State Change"],
  "resources": ["arn:aws:codecommit:ap-south-
1:ACCOUNT_ID:CODECOMMIT_REPO"],
  "detail": {
    "event": ["referenceCreated", "referenceUpdated"],
    "referenceType": ["branch"],
    "referenceName": ["develop"]
  }
}
```


## codepipeline-awscod-develo-497863-rule

### Rule details [Info](#)


Rule name  
codepipeline-awscod-develo-497863-rule

Description  
Amazon CloudWatch Events rule to automatically start your pipeline when a change occurs in the AWS CodeCommit source repository and branch. Deleting this may prevent changes from being detected in that pipeline. Read more:  
<http://docs.aws.amazon.com/codepipeline/latest/userguide/pipelines-about-starting.html>

Status  
✔ Enabled

Rule ARN  
 arn:aws:events:ap-south-1:082923708139:rule/codepipeline-awscod-develo-497863-rule

Event bus name  
default

Event bus ARN  
 arn:aws:events:ap-south-1:082923708139:event-bus/default

### Event pattern

### Targets

### Monitoring

### Tags

### Event pattern [Info](#)

```
1 {
2   "source": ["aws.codecommit"],
3   "detail-type": ["CodeCommit Repository State Change"],
4   "resources": ["arn:aws:codecommit:ap-south-1:082923708139:aws-codeploy-test-repo"],
5   "detail": {
6     "event": ["referenceCreated", "referenceUpdated"],
7     "referenceType": ["branch"],
8     "referenceName": ["develop"]
9   }
10 }
```



Copy

Amazon EventBridge > Rules > codepipeline-awscod-develo-497863-rule

## codepipeline-awscod-develo-497863-rule

Edit

Disable


Delete

### Rule details [Info](#)

Rule name  
codepipeline-awscod-develo-497863-rule

Description  
Amazon CloudWatch Events rule to automatically start your pipeline when a change occurs in the AWS CodeCommit source repository and branch. Deleting this may prevent changes from being detected in that pipeline. Read more:  
<http://docs.aws.amazon.com/codepipeline/latest/userguide/pipelines-about-starting.html>

Status  
✔ Enabled

Rule ARN  
 arn:aws:events:ap-south-1:082923708139:rule/codepipeline-awscod-develo-497863-rule

Event bus name  
default

Event bus ARN  
 arn:aws:events:ap-south-1:082923708139:event-bus/default

Type

### Event pattern

### Targets

### Monitoring

### Tags

### Targets

Targets

Edit

Target Name	Type	Arn	Input	Role
 <a href="#">arn:aws:codepipeline:ap-south-1:082923708139:dev-ec2-deployment-pipeline-today</a> 	CodePipeline	 <a href="#">arn:aws:codepipeline:ap-south-1:082923708139:dev-ec2-deployment-pipeline-today</a>	Matched event	<a href="#">cwe-role-ap-south-1-dev-ec2-deployment-pipeline-today</a> 
Input to target: Matched event				

- If you make changes in the branch that is configured in cloudwatch event, the codepipeline will automatically start.

CodeCommit Source

Pipeline Checkout

Upload to S3

SourceArtifact

CodeDeploy Application

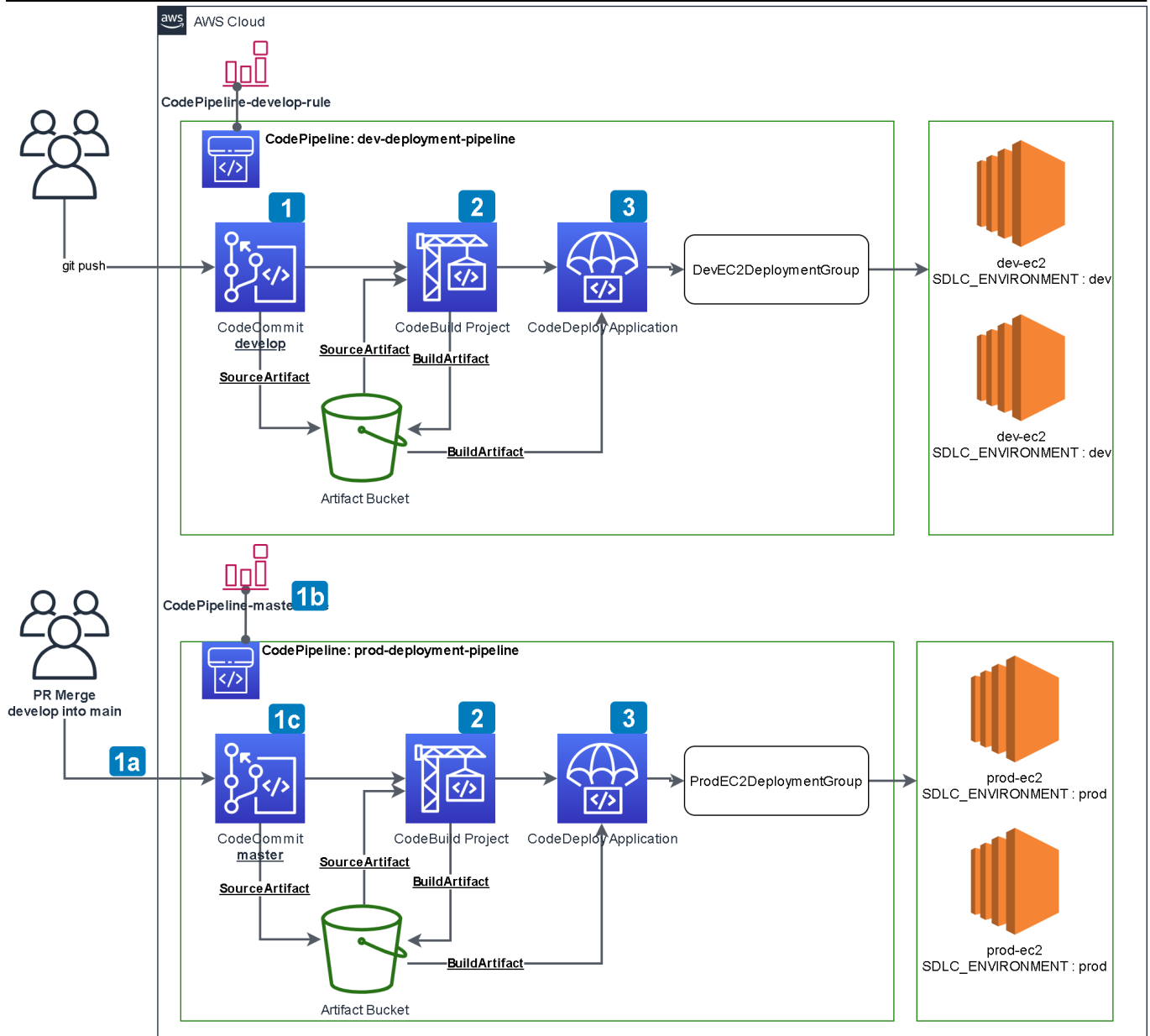
DevEC2DeploymentGroup

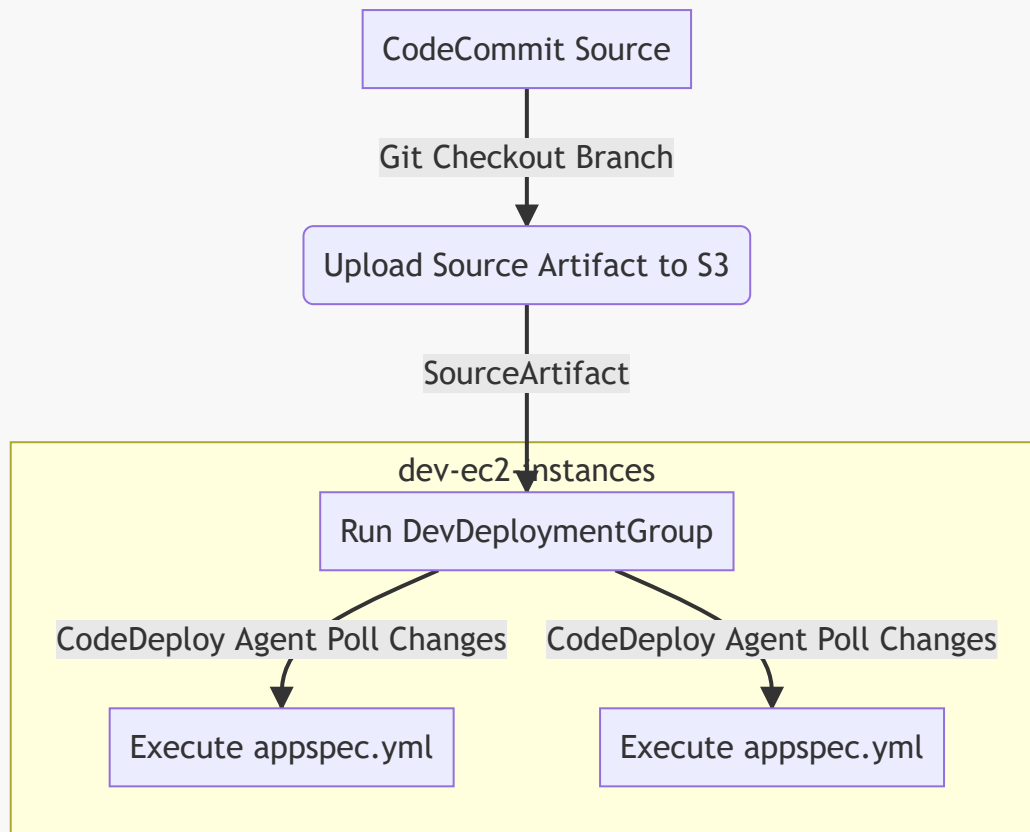
dev-ec2-Instance

---

# AWS CodePipeline

CodeCommit -> CodeBuild -> CodeDeploy





## Testing the Pipeline Executions

- Change some content in the source code file in the branch configured above, and push the changes in the CodeCommit Repo.
- This will trigger the CodePipeline with (Codecommit and CodeDeploy stage).
- Above CodePipeline Project will directly deploy anything that is pushed to Repo in the specified branch that is configured in CloudWatch Event Rule.
- Once Pipeline is executed successfully for stages configured, validate all the steps from commits made in repo to application code that is deployed on WebServers.
- Validate the CodeDeploy Agent Execution Logs on any of the Webserver.
- CodePipeline Execution History will be maintained for each pipeline run as below.

Developer Tools > CodePipeline > Pipelines > dev-ec2-deployment-pipeline-today > Execution history

Execution history <small>Info</small>							Stop execution	View details
<input type="text"/>							< 1 >	⚙
	Execution ID	Status	Source revisions	Duration	Completed	Trigger		
<input type="radio"/>	2784e787-e5ae-4fe4-89e6-8fe52ff86538	✔ Succeeded	Source – 46bd0499: add new line	36 seconds	Sep 3, 2022 9:04 AM (UTC+5:30)	CloudWatchEvent - rule/codepipeline-awscod-develo-497863-rule <a href="#">🔗</a>		
<input type="radio"/>	3269ac1f-856c-476e-8b87-df59d18d709d	✔ Succeeded	Source – e4e2d54c: add today in index.html	36 seconds	Sep 3, 2022 8:57 AM (UTC+5:30)	CloudWatchEvent - rule/codepipeline-awscod-develo-497863-rule <a href="#">🔗</a>		
<input type="radio"/>	9b604e28-7242-489b-a8ae-662d14412bae	✔ Succeeded	Source – 10937ddf: change for date	36 seconds	Sep 3, 2022 8:52 AM (UTC+5:30)	CloudWatchEvent - rule/codepipeline-awscod-develo-497863-rule <a href="#">🔗</a>		
<input type="radio"/>	3422aa45-a1af-41d9-9859-72a69636ef19	✔ Succeeded	Source – 27347290: modify date in develop branch	36 seconds	Sep 3, 2022 8:33 AM (UTC+5:30)	StartPipelineExecution - user/ansible-user <a href="#">🔗</a>		
<input type="radio"/>	b25bdd8e-6a5e-4859-b847-a5fbf4648d16	❌ Failed	-	1 second	Sep 3, 2022 8:30 AM (UTC+5:30)	CreatePipeline - user/ansible-user <a href="#">🔗</a>		

## Launching Dev and Prod EC2 instances



- Launch EC2 instances for Prod Environment using TF/CF/Manually.
- Launch more two EC2 instances with CodeDeploy Agent installation Script in the UserData during Launch.
- Make sure new instances are having Tags as `SDLC_ENVIRONMENT : prod`
- Go to the same CodeDeploy Application -> Create a new Deployment Group with name `ProdEC2DeploymentGroup` for the newly launched EC2 instances Tag Key:Value pair as `SDLC_ENVIRONMENT : prod` Tag.

## Creating Prod Deployment Pipeline

- Create another Pipeline/Clone above pipeline, with similar above stages to configure the same for prod environment deployment i.e `prod-deployment-pipeline`.
- Configure the Source Stage for CodeCommit Repository with `main/master` branch.
- Configure the Deploy Stage with CodeDeploy Application with `ProdEC2DeploymentGroup`.
- Raise a PR to merge changes from `develop` into `master/main`.
  - `Fast forward merge`: All source branch commits will be available in Destination branch.
  - `Squash and Merge`: All source branch commits will be squashed into a single commit and single commit will be merged into Destination branch.
- Once Changes are present in `master/main` branch, `prod-deployment-pipeline` should get started automatically due to CloudWatch Event Rule.

## Reference

- Follow steps [CodeDeploy Logs into Cloudwatch](#) to add CodeDeploy EC2 Logs into CloudWatch.