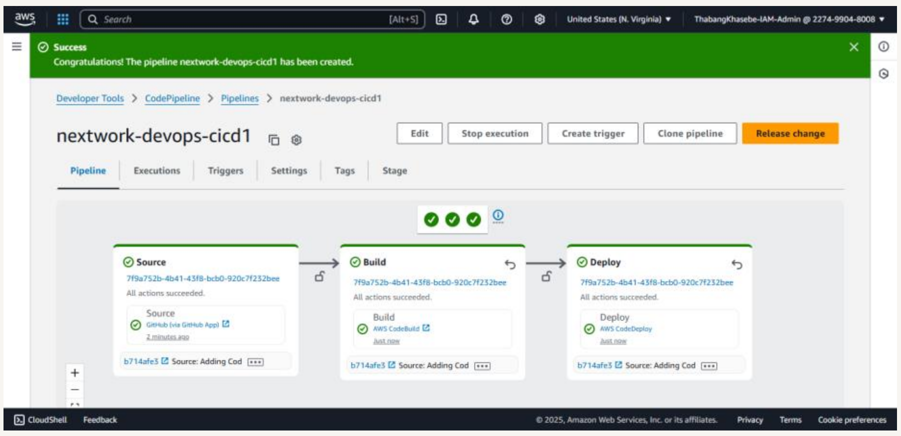
Build a CI/CD Pipeline with AWS

Thabang Khasebe



United States (N. Virginia) ▾ ThabangKhasebe-IAM-Admin @ 2274-9904-8008 ▾

Success
Congratulations! The pipeline nextwork-devops-cicd1 has been created.

Developer Tools > CodePipeline > Pipelines > nextwork-devops-cicd1

nextwork-devops-cicd1

Source
7f9a752b-4b41-43f8-bcb0-920c7f232bee
All actions succeeded.
Source
GitHub (via GitHub App)
2 minutes ago
b714afe3 Source: Adding Cod

Build
7f9a752b-4b41-43f8-bcb0-920c7f232bee
All actions succeeded.
Build
AWS CodeBuild
Just now
b714afe3 Source: Adding Cod

Deploy
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All actions succeeded.
Deploy
AWS CodeDeploy
Just now
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Introducing Today's Project!

In this project, I will demonstrate how to set up an automated CI/CD pipeline using AWS CodePipeline. I’m doing this project to learn how to seamlessly connect code changes,build processes, and deployments for faster, more reliable software delivery.

Key tools and concepts

Services I used were CodePipeline, CodeBuild, CodeDeploy, and GitHub. Key concepts I learnt include automating CI/CD workflows, connecting source, build, deploy stages, using webhooks to trigger pipelines, and monitoring deployments from start to end

Project reflection

This project took me approximately 3 hours. The most challenging part was configuring the connections between services. It was most rewarding to see the entire CI/CD pipeline run automatically from code push to deployment.

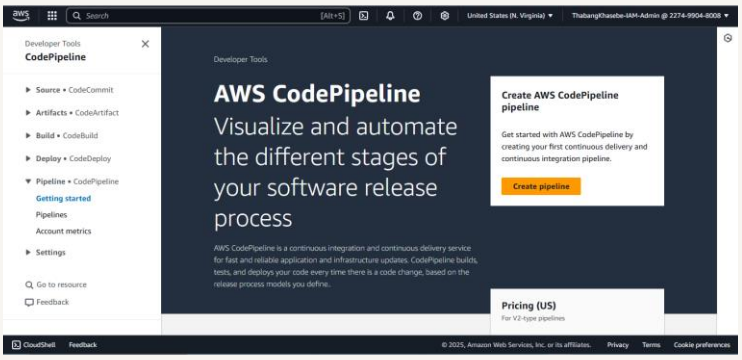
Thabang Khasebe

Starting a CI/CD Pipeline

AWS CodePipeline is a fully managed continuous integration and continuous delivery (CI/CD) service that automates the steps required to release software. It connects source control, build, and deployment stages to streamline application delivery.

CodePipeline offers different execution modes based on how actions run. I chose serial execution, where actions run one after another. Other options include parallel execution, which allows multiple actions to run at the same time for faster delivery

A service role gets created automatically during setup so CodePipeline can interact with other AWS services on your behalf, like pulling code from GitHub, triggering builds in CodeBuild, and deploying using CodeDeploy.



Developer Tools

AWS CodePipeline

Visualize and automate the different stages of your software release process

AWS CodePipeline is a continuous integration and continuous delivery service for fast and reliable application and infrastructure updates. CodePipeline builds, tests, and deploys your code every time there is a code change, based on the release process models you define.

Create AWS CodePipeline pipeline

Get started with AWS CodePipeline by creating your first continuous delivery and continuous integration pipeline.

Pricing (US)

For V2-type pipelines

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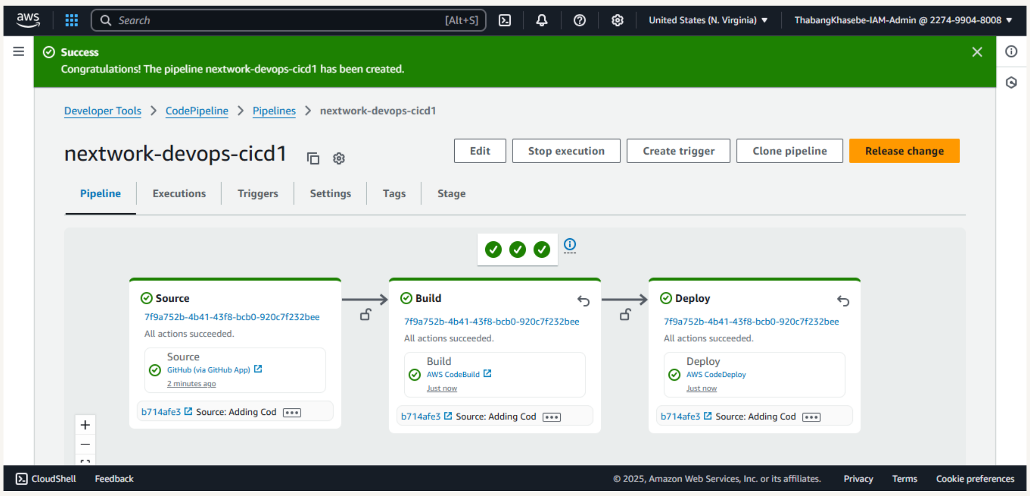
CI/CD Stages

The three stages I've set up in my CI/CD pipeline are Source, Build, and Deploy. While setting up each part, I learnt about connecting GitHub for code, using CodeBuild to compile and test, and CodeDeploy to automate deployment to EC2 instances.

CodePipeline organizes the three stages into visual steps with status indicators. In each stage, you can see more details on progress, logs, success or failure, and timing to monitor the pipeline’s health and troubleshoot issues quickly.


aws
Search [Alt+S]
United States (N. Virginia) ▼
ThabangKhasebe-IAM-Admin @ 2274-9904-8008 ▼

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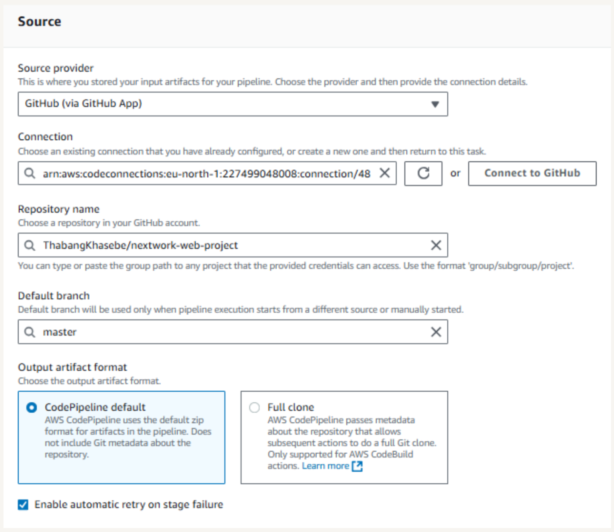
Source Stage

In the Source stage, the default branch tells CodePipeline which branch to monitor for changes. This ensures that only updates pushed to the specified branch will trigger the pipeline's automated build and deployment process.

The source stage is also where you enable webhook events, which automatically trigger the pipeline whenever changes are pushed to the connected GitHub branch. This ensures the CI/CD process runs continuously without manual intervention.



Source

Source provider
This is where you stored your input artifacts for your pipeline. Choose the provider and then provide the connection details.
GitHub (via GitHub App)

Connection
Choose an existing connection that you have already configured, or create a new one and then return to this task.
arn:aws:codeconnections:eu-north-1:227499048008:connection/48 or Connect to GitHub

Repository name
Choose a repository in your GitHub account.
ThabangKhasebe/nextwork-web-project
You can type or paste the group path to any project that the provided credentials can access. Use the format 'group/subgroup/project'.

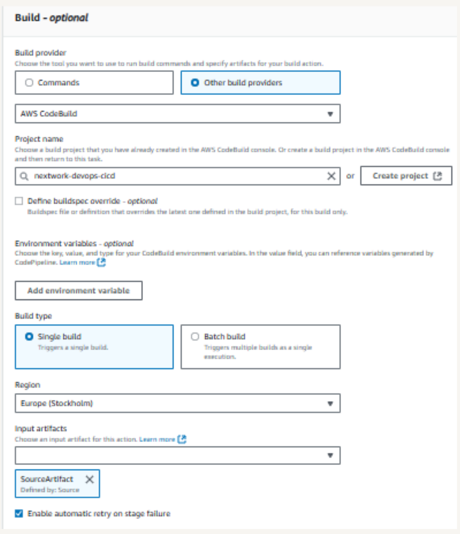
Default branch
Default branch will be used only when pipeline execution starts from a different source or manually started.
master

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. Learn more

✓ Enable automatic retry on stage failure

Build Stage

The Build stage sets up CodeBuild to compile and package the app. I configured it to use SourceArtifact. The input artifact for the build stage is SourceArtifact, which contains the latest code from GitHub.



Build - *optional*

Build provider
Choose the tool you want to use to run build commands and specify artifacts for your build action.
Commands [✓ Other build providers]

AWS CodeBuild

Project name
Choose a build project that you have already created in the AWS CodeBuild console. Or create a build project in the AWS CodeBuild console and then return to this task.
nextwork-devops-cicd or Create project

☐ Define buildspec override - *optional*
Buildspec file or definition that overrides the latest one defined in the build project, for this build only.

Environment variables - *optional*
Choose the key, value, and type for your CodeBuild environment variables. In the value field, you can reference variables generated by CodePipeline. Learn more

Add environment variable

Build type
[✓ Single build] Triggers a single build.
Batch build Triggers multiple builds as a single execution.

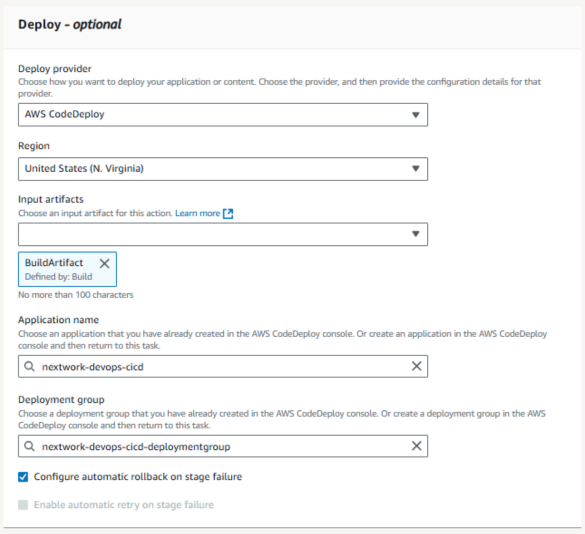
Region
Europe (Stockholm)

Input artifacts
Choose an input artifact for this action. Learn more
SourceArtifact
Defined by: Source

☑ Enable automatic retry on stage failure

Deploy Stage

The Deploy stage is where the built application is automatically deployed to the target environment. I configured it to use my CodeDeploy deployment group to push the web app to the EC2 instance.



Deploy - *optional*

Deploy provider
Choose how you want to deploy your application or content. Choose the provider, and then provide the configuration details for that provider.
AWS CodeDeploy

Region
United States (N. Virginia)

Input artifacts
Choose an input artifact for this action. Learn more
BuildArtifact
Defined by: Build
No more than 100 characters

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.
nextwork-devops-cicd

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.
nextwork-devops-cicd-deploymentgroup

☑ Configure automatic rollback on stage failure

☐ Enable automatic retry on stage failure

Success!

Since my CI/CD pipeline gets triggered by GitHub changes, I tested my pipeline by adding a new line in `index.jsp` that confirms automatic deployment by CodePipeline.

The moment I pushed the code change, the pipeline automatically started running. The commit message under each stage reflects the latest update, showing the progress from source to build to deployment.

Once my pipeline executed successfully, I checked the deployed web app in my browser and saw the new line I added in index.jsp, confirming the latest changes were automatically built and deployed.

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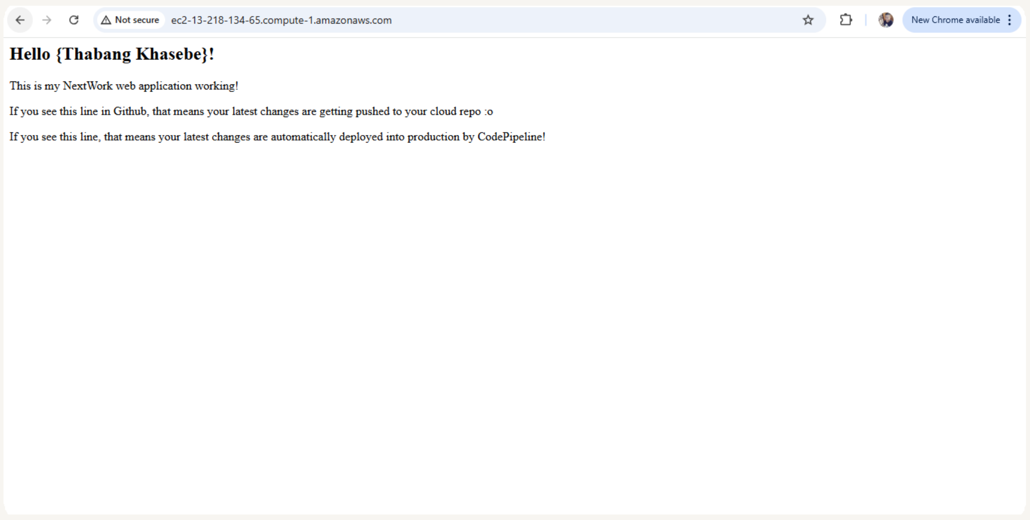

Hello {Thabang Khasebe}!

This is my NextWork web application working!

If you see this line in Github, that means your latest changes are getting pushed to your cloud repo :o

If you see this line, that means your latest changes are automatically deployed into production by CodePipeline!