

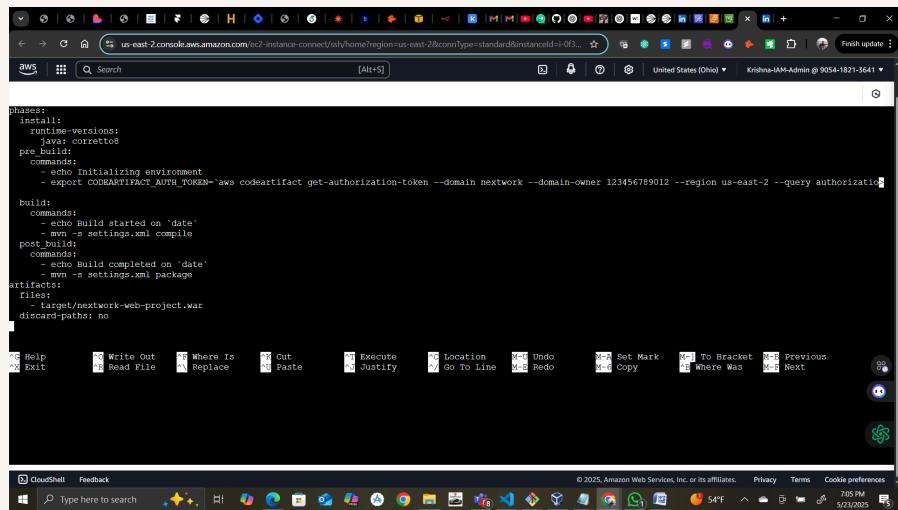


nextwork.org

Continuous Integration with CodeBuild

MO

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```
phases:
  install:
    runtime-versions:
      java: corretto8
  pre-build:
    commands:
      - echo Initializing environment
      - export CODEARTIFACT_AUTH_TOKEN=$(aws codeartifact get-authorization-token --domain nextwork --domain-owner 123456789012 --region us-east-2 --query authorizationToken)
  build:
    commands:
      - echo Build started on `date`
      - mvn settings.xml compile
  post-build:
    commands:
      - echo Build completed on `date`
      - mvn -f settings.xml package
artifacts:
  files:
    - target/nextwork-web-project.war
  discard-paths: no
```

Introducing Today's Project!

In this project, I will demonstrate how to set up AWS CodeBuild to automate building and testing my web app. I'm doing this project to learn CI/CD automation and improve my DevOps skills with real-world tools.

Key tools and concepts

Services I used were EC2, CodeArtifact, S3, IAM, and CodeBuild. Key concepts I learnt include setting up CI/CD, managing build artifacts, using buildspec.yml, IAM permissions, and integrating GitHub with CodeBuild for automation.

Project reflection

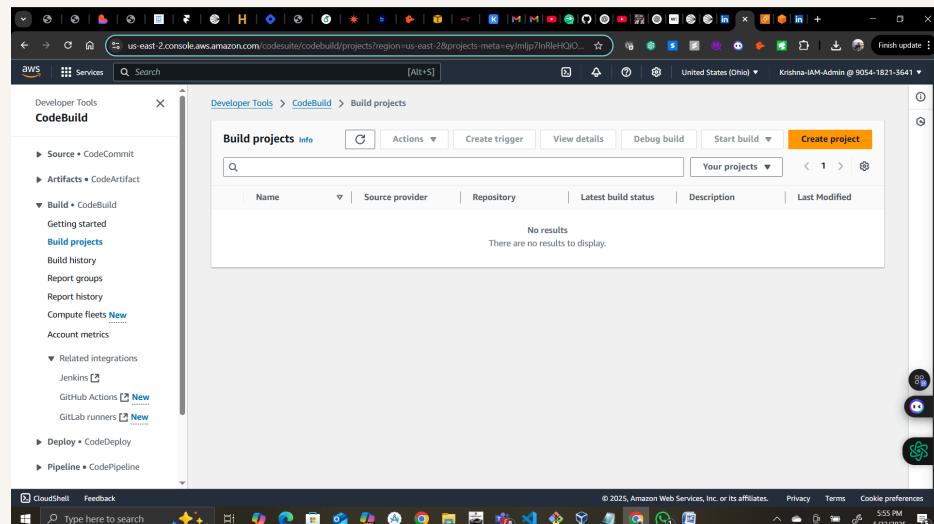
This project took me approximately 3 hours to complete. The most challenging part was configuring IAM roles for CodeBuild to access CodeArtifact. It was most rewarding to see the build succeed and artifacts uploaded to S3.

This project is part four of a series of DevOps projects where I'm building a CI/CD pipeline! I'll be working on the next project tomorrow to continue improving my automation skills.

Setting up a CodeBuild Project

CodeBuild is a continuous integration service, which means it automatically builds and tests code changes. Engineering teams use it because it speeds up development, reduces errors, and ensures consistent, reliable software delivery in CI/CD pipeline

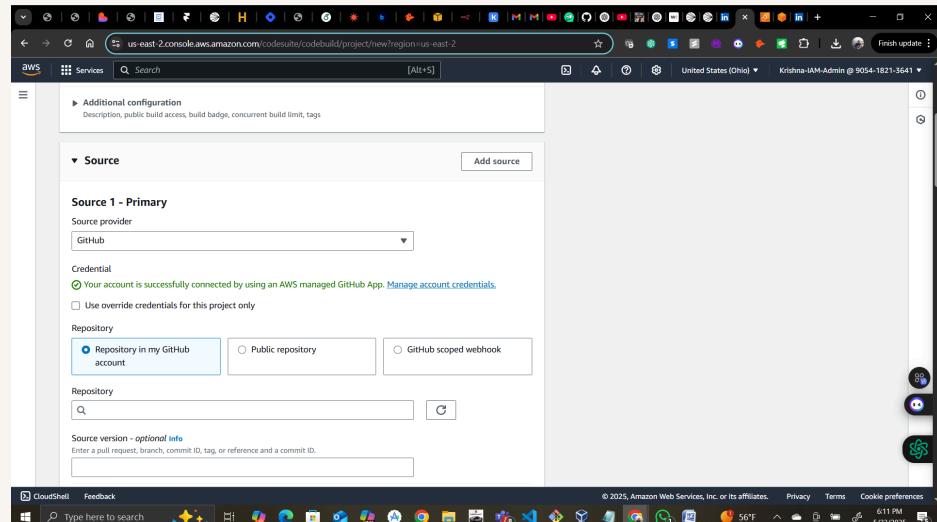
My CodeBuild project's source configuration means where CodeBuild pulls the code to build from, and I selected my GitHub repository so it can automatically build whenever I push changes there.



Connecting CodeBuild with GitHub

There are multiple credential types for GitHub, like personal access tokens and GitHub App. I used GitHub App because it's more secure, supports fine-grained permissions, and is the recommended method for integrating with AWS CodeBuild.

The service that helped connect AWS CodeBuild to my GitHub repository is AWS CodeConnections. It securely establishes a link between AWS and GitHub, allowing CodeBuild to access my codebase for builds and automations.



CodeBuild Configurations

Environment

I've configured the build environment using Amazon Linux with the Standard runtime and Corretto 8 image, and created a new service role. This setup ensures compatibility with my Java app and grants CodeBuild the permissions it needs.

Artifacts

Build artifacts are the final outputs of the build, like JAR/WAR files. They're important because they're deployed later. My build process will create a WAR file. To store them, I created an S3 bucket for CodeBuild to upload these files.

Packaging

When setting up CodeBuild, I also chose to package artifacts in a ZIP file because it keeps all build outputs bundled neatly, making transfers to deployment services easier. ZIP files ensure consistency and compatibility across deployment steps.

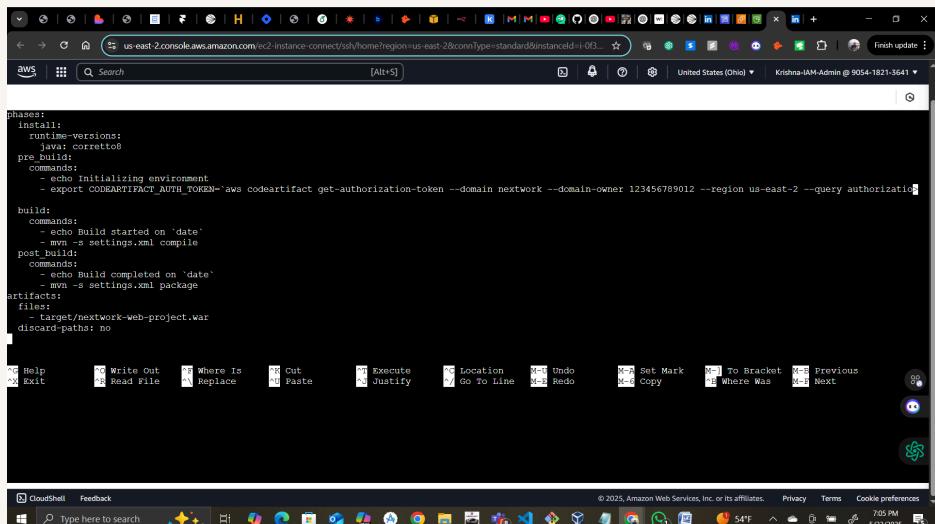
Monitoring

For monitoring, I enabled CloudWatch Logs, which is an AWS service that captures and stores logs from CodeBuild. It's useful for troubleshooting build failures, tracking build progress, and ensuring transparency throughout the CI/CD process.

buildspec.yml

We need `buildspec.yml` because it tells CodeBuild exactly how to build our app—like a step-by-step script. It automates install, build, and deploy phases, keeps build steps versioned with code, and replaces manual build commands.

The first two phases in my buildspec.yml file install dependencies and set up the environment. The third phase in my buildspec.yml file compiles the app. The fourth phase in my buildspec.yml file handles packaging or cleanup.



A screenshot of a terminal window titled "aws" on a Windows desktop. The window displays a buildspec.yml configuration file. The file contains several sections: phases, install, runtime-versions, java, correto8, pre-build, commands, echo, initializing environment, export CODEARTIFACT_AUTH_TOKEN, build, commands, echo, build started on date, mvn, settings.xml compile, post-build, commands, echo, build completed on date, mvn, settings.xml package, artifacts, files, target/nextwork-web-project.war, and discard-paths: no. The terminal window has a dark theme and includes standard keyboard shortcuts at the bottom. The background shows a Windows taskbar with various icons and system status.

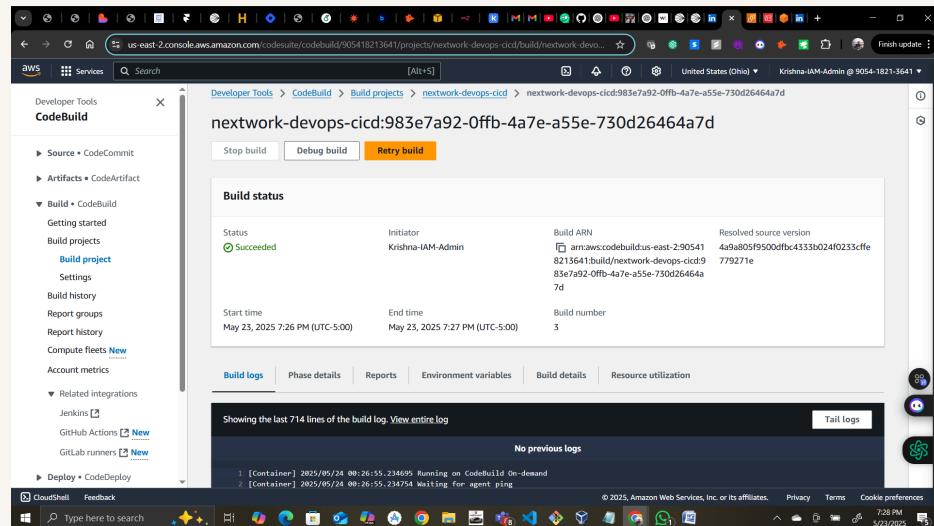
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Success!

This error means CodeBuild can't access `settings.xml` due to missing permissions. To fix it, I'll update CodeBuild's IAM role with a policy allowing access to CodeArtifact so it can download dependencies securely.

I added the `codeartifact-nextwork-consumer-policy` to my CodeBuild role to fix permission issues. After retrying the build in CodeBuild, it ran successfully, showing a green checkmark and confirming the pipeline works!

I refreshed my S3 bucket and saw the `nextwork-devops-cicd-artifact.zip` file. After downloading and checking the zip, I found the `nextwork-web-project.war` file inside, confirming the build successfully produced the expected output.





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