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Project: CI CD Pipeline with GitHub Actions and AWS

Overview

I implemented a production grade CI/CD pipeline using GitHub Actions and AWS. The pipeline automates build, test, security scanning, and container publishing for a Java application across multiple environments.

Problem Statement

Engineering teams needed a CI/CD solution that could:

+ Support multiple environments without leaking secrets
+ Prevent accidental production deployments
+ Enforce testing and security checks before release
+ Provide repeatable and auditable deployments
+ Integrate securely with AWS container infrastructure

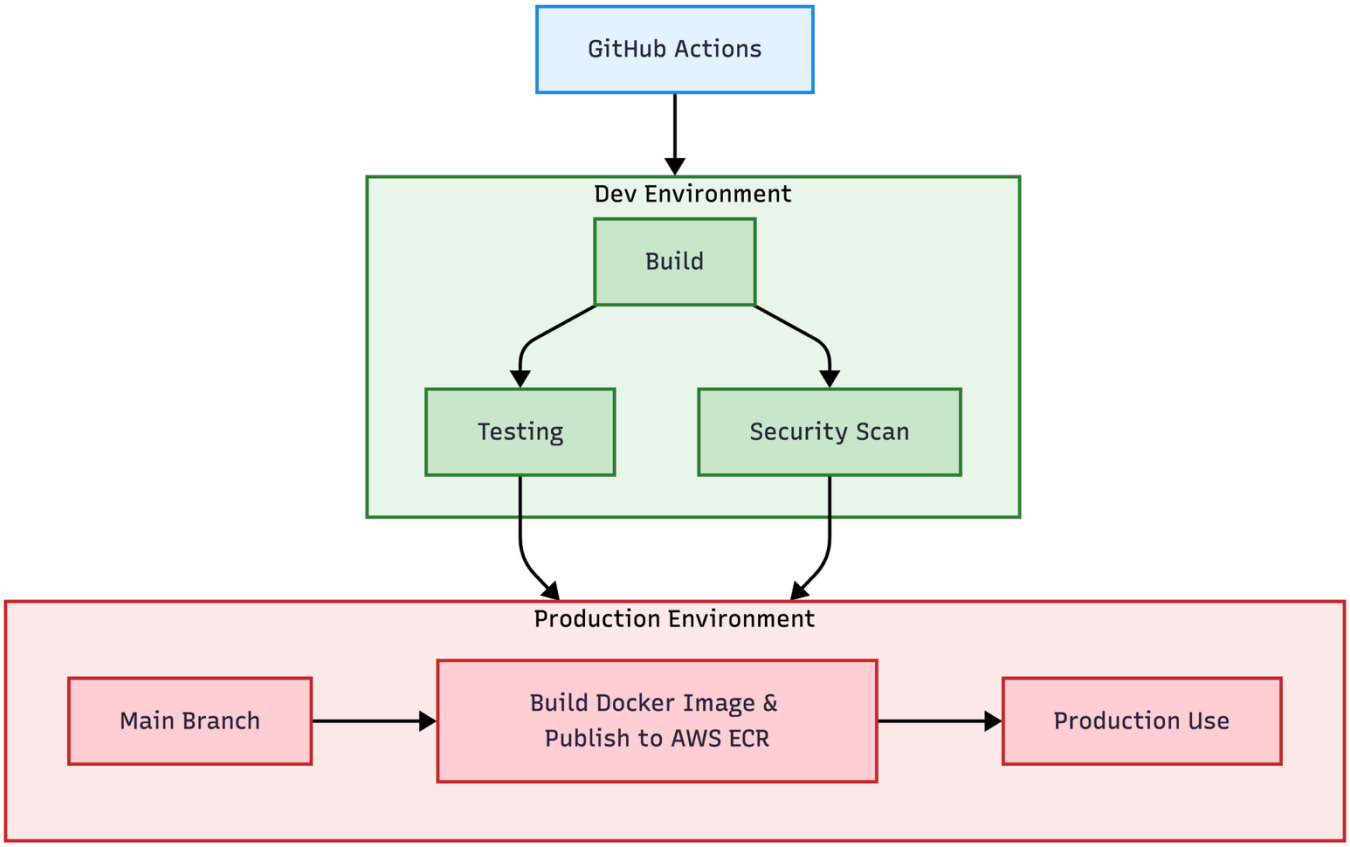
Goal: Responsible for designing and implementing an end to end CI/CD workflow that supports **multiple environments** using GitHub Actions.

By Ikenna Anasieze

Tech Stack

+ GitHub Actions – CI/CD orchestration
+ Maven – Java build and packaging
+ Docker – Application containerization
+ Trivy – Security and vulnerability scanning
+ Amazon ECR – Container image registry
+ AWS IAM – Environment scoped access control

Architecture Overview



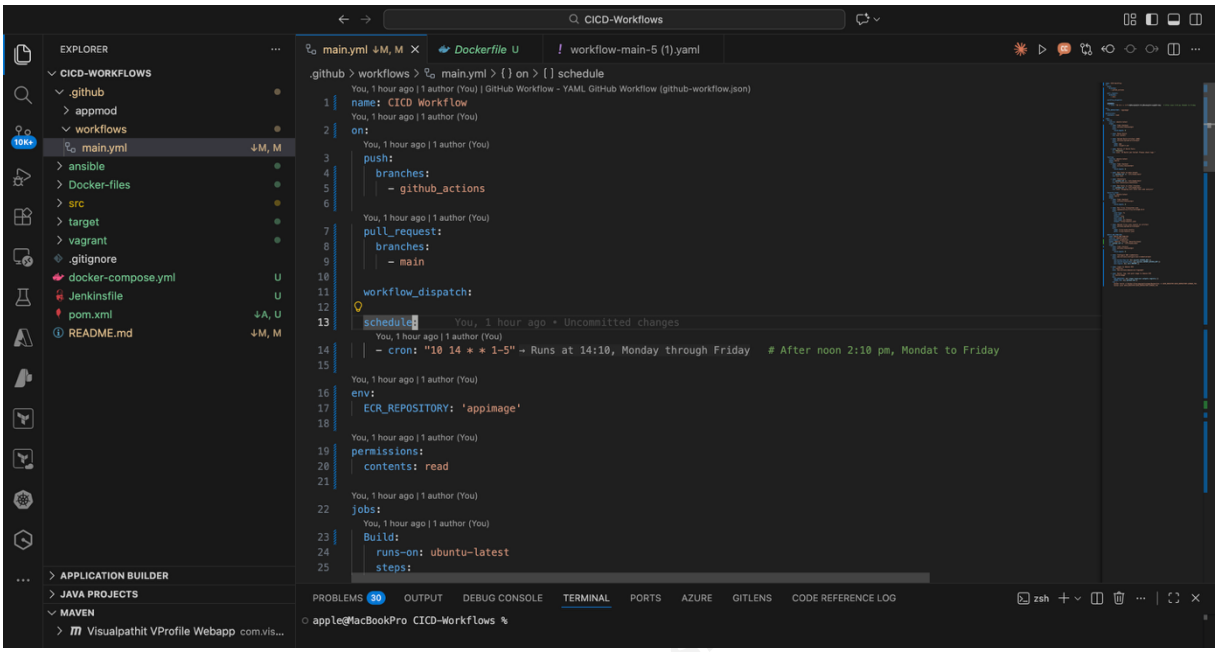
Flow of Pipeline

+ Code changes are pushed to feature branches or submitted via pull requests
+ CI jobs run automatically to build the application and generate artifacts
+ Security scanning runs in parallel with build validation
+ Tests and static analysis run when changes reach the main branch
+ Production release is gated and triggered only from main
+ Docker images are built and published to Amazon ECR using production scoped credentials

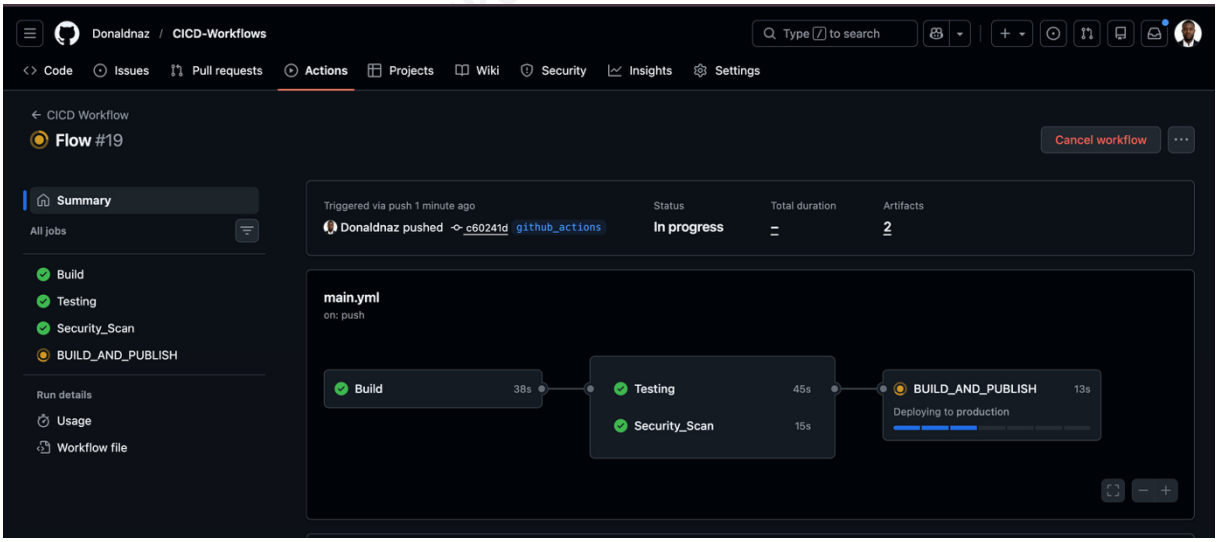
This design ensures production remains protected while allowing fast iteration in lower environments.

Deployment Steps

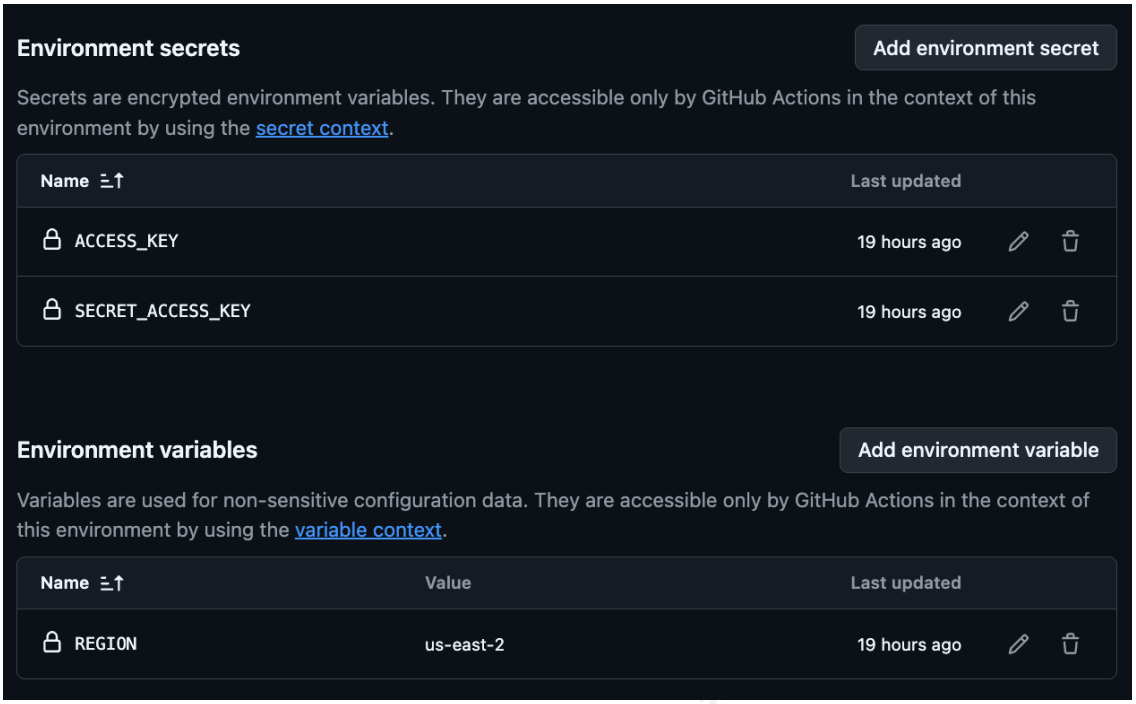
+ Created a GitHub Actions workflow with job dependencies



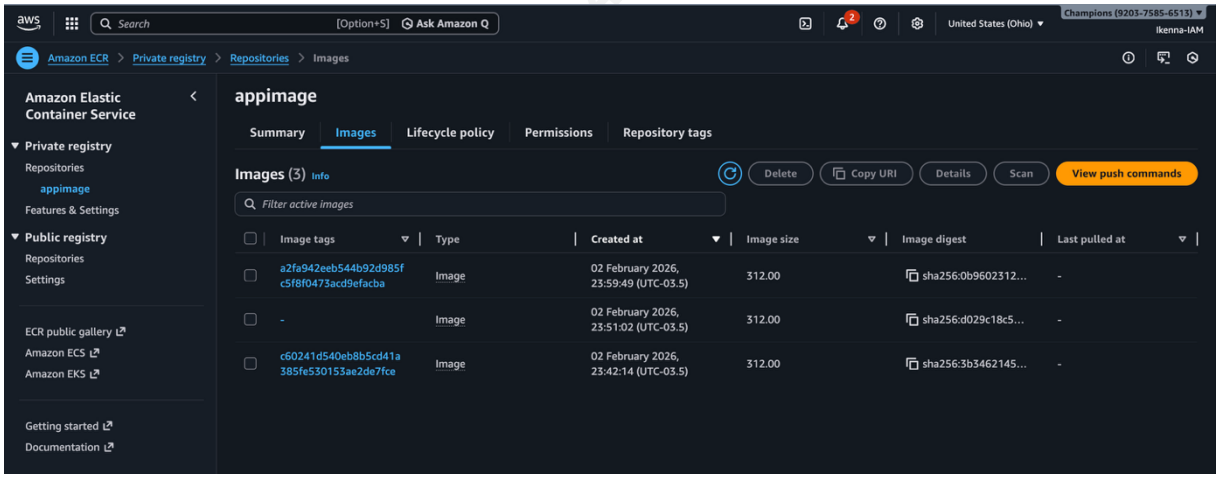
+ Configured build, test, and security scan stages



+ Protected production deployment using a GitHub environment



+ Built and published Docker images to Amazon ECR from main



Outcome

- A fully operational multi environment CI/CD pipeline
- Safe promotion of code from development to production
- Secure and repeatable Docker image publishing to ECR

Key Takeaway

CI/CD is not about YAML files. It is about **control, safety, and repeatability at scale**.