CI/CD Jenkins Pipeline-Based Web Application Deployment

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Blueprint of the Project:

The CI/CD pipeline project is structured to reflect modern DevOps practices and is built around the following core components:

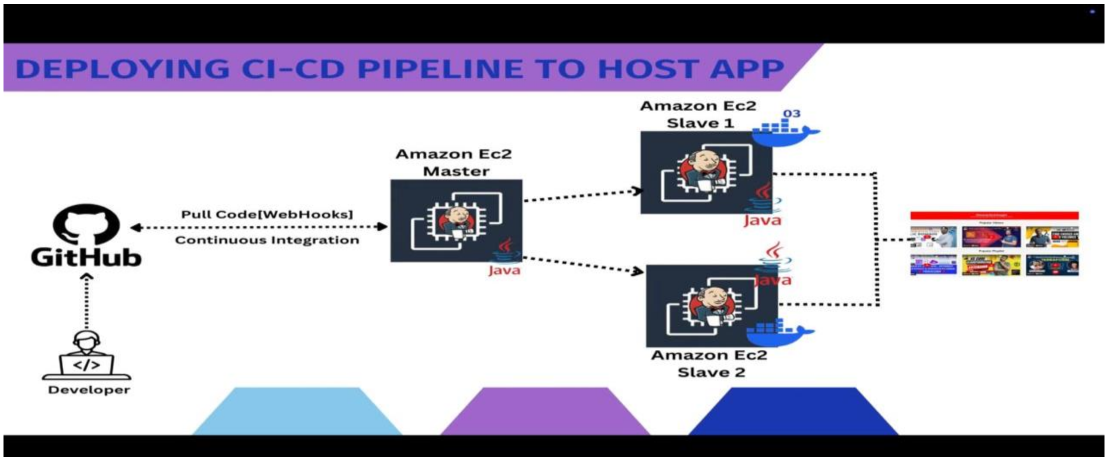
1. Source Control (GitHub):
   - Version control for application source code.
   - Webhook to trigger Jenkins pipeline.

2. CI/CD Pipeline (Jenkins):
   - Jenkins master installed on EC2 instance.
   - Configured Jenkinsfile to define build, test, and deploy steps.

3. Deployment Target (Amazon EC2):
   - Deployed application to cloud instance.
   - Amazon Linux OS configured with inbound rules.

Flow Diagram of Plan:

Flow diagram illustrating CI/CD pipeline:



Services Used:

Service/Tool	Why It’s Used
Jenkins	Automates CI/CD pipeline for deployment.
GitHub	Version control and webhook integration.
Amazon EC2	Hosting Jenkins and deployed app.
Amazon Linux	OS for EC2 instances and Jenkins.
Java & Spring Boot	Backend development stack.
Prompt Engineering	Interacting with AI coding assistants.

Step by Step Execution Process:

Step 1 – Environment Setup

- Launch EC2 instance with Amazon Linux.
- Install Java, Jenkins, and necessary tools.

Step 2 – Configure Jenkins

- Set up Jenkins master.
- Install plugins for Git, Pipeline, etc.

Step 3 – Set up GitHub Webhook

- Connect GitHub repository to Jenkins via Webhook.

Step 4 – CI/CD Pipeline Configuration

- Create Jenkinsfile to automate build and deployment.

Step 5 – Build and Deploy Application

- Code changes trigger pipeline → Jenkins builds and deploys to EC2.

Step 6 – Monitoring and Output

- Monitor job status on Jenkins dashboard.
- Confirm app deployment on EC2 instance.

Future Enhancements:

- Integrate Docker containers for deployment.
- Add Jenkins agents for distributed builds.
- Incorporate AI-assisted code quality analysis.
- Extend deployment to Kubernetes for scalability.
- Automate testing with Selenium or JUnit.