DevOps Pipeline Project Setup Documentation

Overview

This document provides step-by-step guidance to set up a CI/CD pipeline with Jenkins, SonarQube, Nexus, Docker, Kubernetes, and OWASP tools. This setup ensures a streamlined process for building, testing, and deploying applications while maintaining code quality and security.

Prerequisites

- Server or local machine with sufficient resources(3 EC2 Instances)

-CPU (min. 2Vcpu cores)

- Installed software:

- Java JDK (version 8 or higher)

- Docker

- Kubernetes

- Git

- Maven

- SonarQube

Step-by-Step Setup

Step 1: Install Jenkins on EC2

Prerequisite for Jenkins:

* Java:
* Installation commands for java

sudo apt update

sudo apt install fontconfig openjdk-17-jre

java -version

openjdk version "17.0.8" 2023-07-18

OpenJDK Runtime Environment (build 17.0.8+7-Debian-1deb12u1)

OpenJDK 64-Bit Server VM (build 17.0.8+7-Debian-1deb12u1, mixed mode, sharing)

1. Download Jenkins(for ubuntu):

Commands

sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \

https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key

echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]" \

https://pkg.jenkins.io/debian-stable binary/ | sudo tee \

/etc/apt/sources.list.d/jenkins.list > /dev/null

sudo apt-get update

sudo apt-get install jenkins

2. Run Jenkins:

Commands:

sudo systemctl enable Jenkins

sudo systemctl start Jenkins

sudo systemctl status jenkins

Access Jenkins UI from

<http://localhost:8080>

(In our Project take ec2 instance\_ip:port\_number)

3. Unlock Jenkins:

- Retrieve the initial admin password

cat /var/lib/jenkins/secrets/initialAdminPassword

4. Install Suggested Plugins:

- Follow the prompts to install suggested plugins or select specific ones from the plugins list mentioned earlier.

1. Access Jenkins Dashboard > Manage Jenkins > Manage Plugins.

2. In the ‘Available’ tab, search for and install the following plugins:

- Pipeline

- Git

- SonarQube Scanner for Jenkins

- Nexus Platform Plugin

- Docker Pipeline

- Kubernetes Plugin

- OWASP Dependency Check

- Email Extension Plugin

- Slack Notification Plugin

- Workspace Cleanup Plugin

- OWASP Dependency-Check Plugin

- OWASP ZAP Plugin

Step 3: Install and Configure SonarQube

1. Download SonarQube:

1. Install Docker

Sudo apt install docker.io -y

2. Pull docker image for SonarQube:

Docker pull sonarqube

3. Run Docker image to create container:

Docker run -d -p 9000:9000 image\_id

3. Access SonarQube:

- Open `http://localhost:9000` and create an admin account.

4. Generate Authentication Token:

- Go to "My Account" > "Security" to generate a token for Jenkins.

Step 4: Install and Configure Nexus

1. Install Docker

Apt install docker.io -y

1. Pull Nexus Repository Manager Image to docker:

Docker pull wget https://download.sonatype.com/nexus/3/latest-unix.tar.gz

2.Run the Docker Container from Nexus Image:

Docker run -d -p 8081:8081 image\_id

4. Access Nexus:

- Open `http://localhost:8081` and set up hosted repositories for your projects.

Step 5: Install and Configure Docker on Jenkins Server:

1. Install Docker:

sudo apt-get update

sudo apt-get install docker.io

2. Test Docker Installation:

docker --version

3. Grant the Permissions to the Docker:

sudo usermod -aG docker $USER

newgrp docker

5. Configure the Jenkins: