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Class: D15B/14

Case Study: Continuous Integration with Simple Code Analysis

1. Introduction

This case study focuses on setting up a Continuous Integration (CI) pipeline using Jenkins and an AWS EC2 instance for performing a simple code analysis with SonarQube. The goal is to configure a Jenkins job that will analyze a JavaScript file's code quality using SonarQube, leveraging the EC2 instance as the infrastructure for Jenkins and SonarQube setup.

2. Problem Statement

"Set up a Jenkins pipeline using an AWS EC2 instance to perform a simple code analysis on a JavaScript file using SonarQube."

3. Tools and Concepts Used

- **Jenkins**: Automates software development workflows such as building, testing, and deploying code.
- **AWS EC2**: A virtual server in the cloud, used here to host Jenkins and SonarQube.
- **SonarQube**: A tool for continuous code quality inspection using static code analysis.

4. Key Features and Application

- **Jenkins Pipeline**: Automates the process of running code analysis.
- **AWS EC2**: Provides a flexible cloud-based infrastructure to run Jenkins and SonarQube.
- **SonarQube Integration**: Detects code quality issues, including bugs and vulnerabilities.

5. Steps to Set Up the Jenkins Pipeline with SonarQube

Step 1: EC2 Instance Setup

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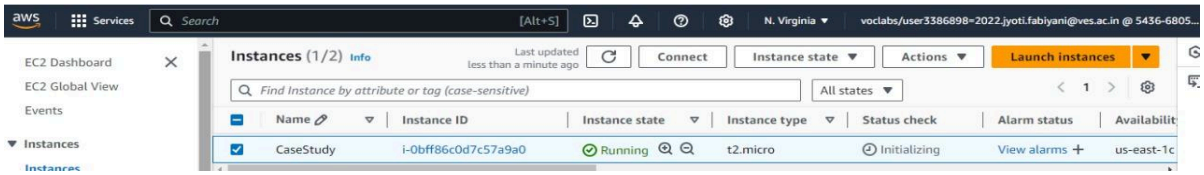
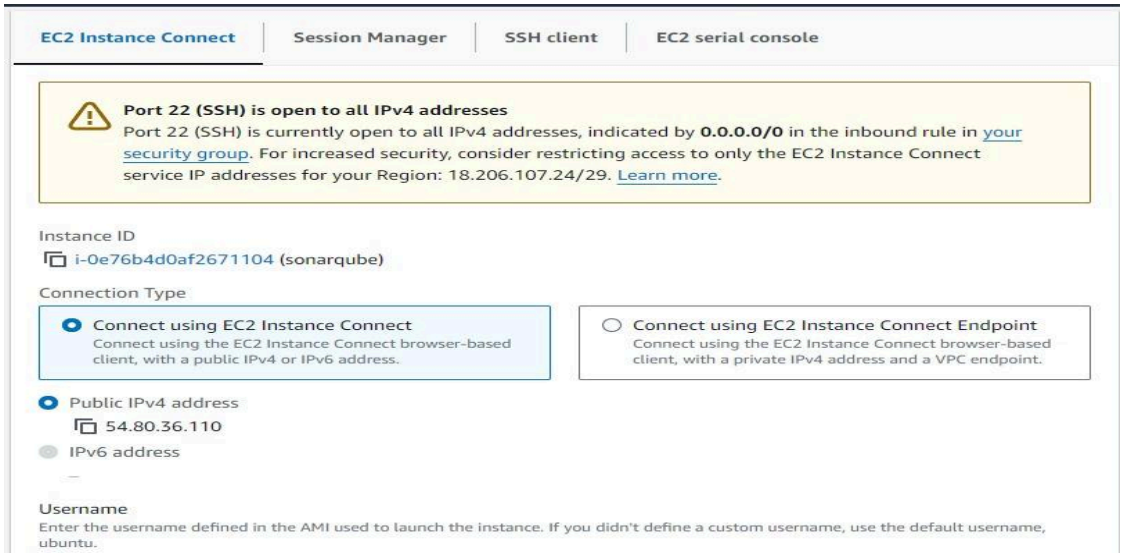
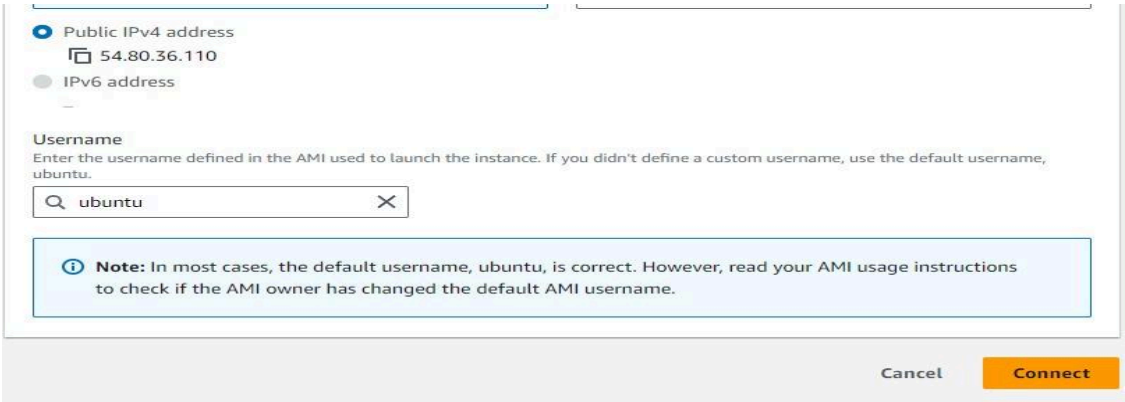
1. **Launch an EC2 instance** from the AWS Management Console:
   - Choose **Ubuntu** as the Amazon Machine Image (AMI).
   - Select the instance type i.e., **t2.micro** and configure security groups to allow access to Jenkins (port 8080) and SonarQube (port 9000).
   - Launch the instance and connect it.







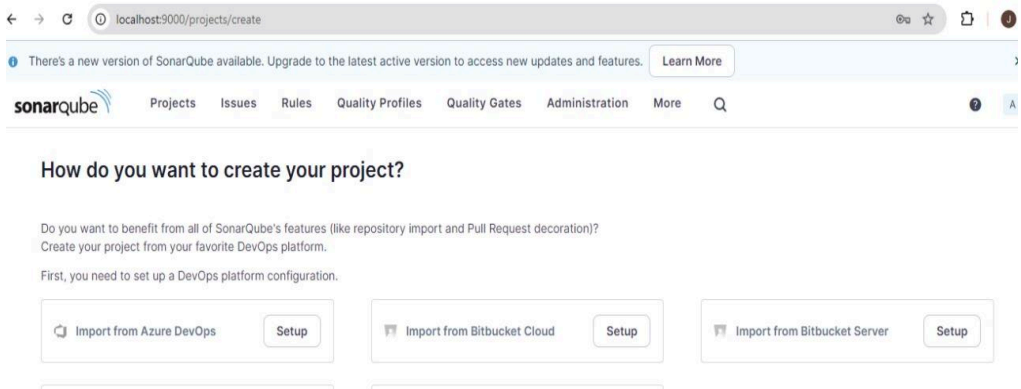
2. Jenkins Initial Setup using following commands:
   - sudo yum update -y
   - sudo wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jenkins.io/redhat-stable/jenkins.repo
   - sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io.key
   - sudo yum install jenkins java-1.8.0-openjdk-devel -y

- sudo systemctl start jenkins
- sudo systemctl enable jenkins

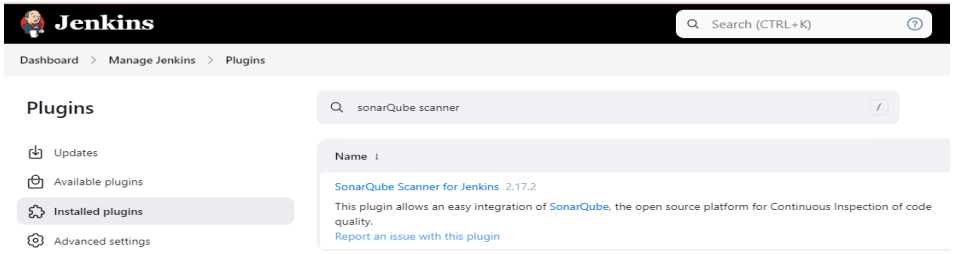
```
ubuntu@ip-172-31-33-119:~$ sudo systemctl restart jenkins
ubuntu@ip-172-31-33-119:~$ sudo systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
     Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vend>
     Active: active (running) since Tue 2024-10-15 19:42:38 UTC; 20min >
   Main PID: 12064 (java)
      Tasks: 39 (limit: 1130)
     Memory: 228.6M
        CPU: 12.025s
     CGroup: /system.slice/jenkins.service
             └─12064 /usr/bin/java -Djava.awt.headless=true -jar /usr/s>

Oct 15 19:42:37 ip-172-31-33-119 jenkins[12064]: WARNING: Please consid>
Oct 15 19:42:37 ip-172-31-33-119 jenkins[12064]: WARNING: Use --illegal>
Oct 15 19:42:37 ip-172-31-33-119 jenkins[12064]: WARNING: All illegal a>
Oct 15 19:42:38 ip-172-31-33-119 jenkins[12064]: 2024-10-15 19:42:38.36>
Oct 15 19:42:38 ip-172-31-33-119 jenkins[12064]: 2024-10-15 19:42:38.36>
Oct 15 19:42:38 ip-172-31-33-119 jenkins[12064]: 2024-10-15 19:42:38.39>
Oct 15 19:42:38 ip-172-31-33-119 jenkins[12064]: 2024-10-15 19:42:38.41>
Oct 15 19:42:38 ip-172-31-33-119 jenkins[12064]: 2024-10-15 19:42:38.49>
Oct 15 19:42:38 ip-172-31-33-119 jenkins[12064]: 2024-10-15 19:42:38.52>
Oct 15 19:42:38 ip-172-31-33-119 systemd[1]: Started Jenkins Continuous>
```

Step 2: Jenkins Initial Setup

1. Open Jenkins from the public IP of the EC2 instance on port 8080 (http://54.80.36.110:8080).
2. Install the SonarQube Plugin in Jenkins:
   - Ensure that SonarQube is running on **port 9000**:

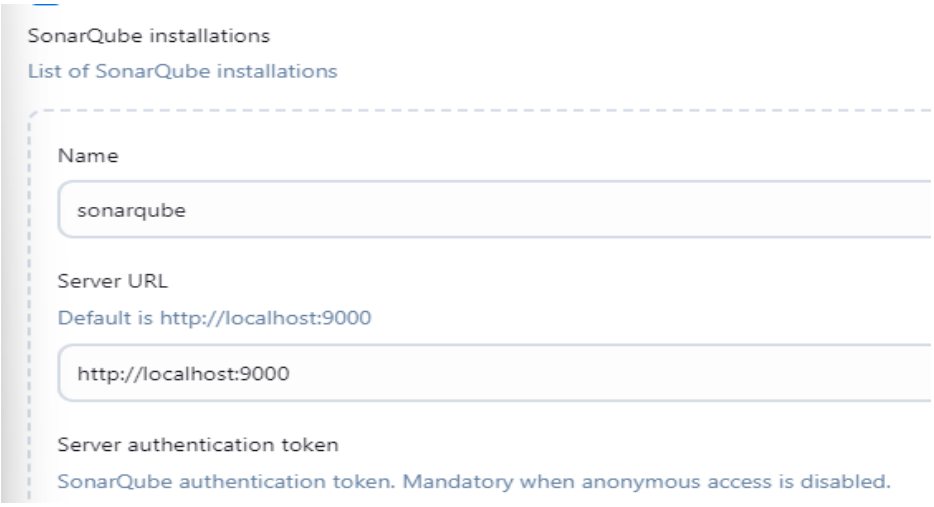


   - In Jenkins, go to **Manage Plugins**, search for **SonarQube Scanner**, and install it.



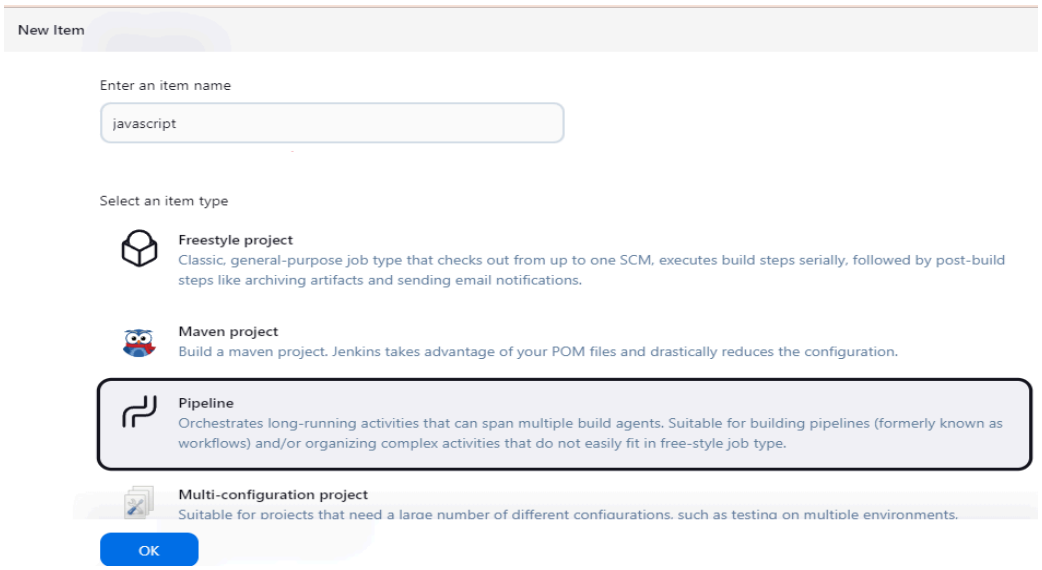
3. **Configure SonarQube in Jenkins**:

- Go to **Manage Jenkins > Configure System**, scroll to the **SonarQube Servers** section, and add a new SonarQube server.
- Provide the server URL (e.g., `http://localhost:9000`) and the authentication token from SonarQube.



Step 3: Create a Jenkins Pipeline Job

1. **Create a New Pipeline Job**:
   - In the Jenkins dashboard, click **New Item** and choose **Pipeline** as the job type. Give it a name “javascript”.



- Setup a github repository (my–js-project) and add some simple javaScript code (app.js).

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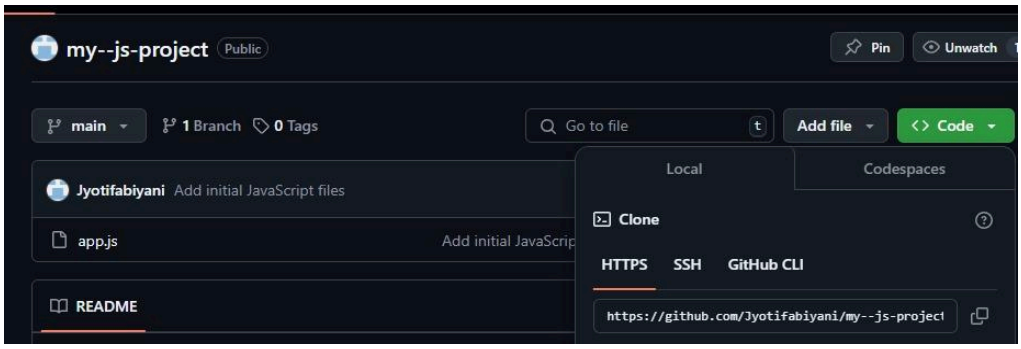

2. **Configure the Pipeline to Fetch Code from GitHub**:

- Choose **Git** as the source control and provide the repository URL where your JavaScript code resides.

Step 4: SonarQube Code Analysis in the Pipeline Script

1. **Pipeline script:**

Step 5: Save and Run the Pipeline

- After configuring the pipeline, click "Save".
- To trigger the job, click on "Build Now".

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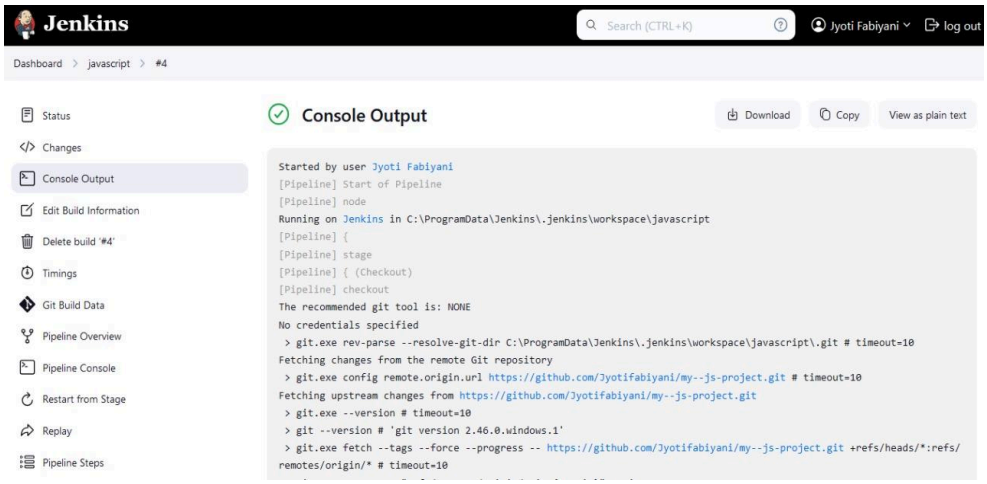
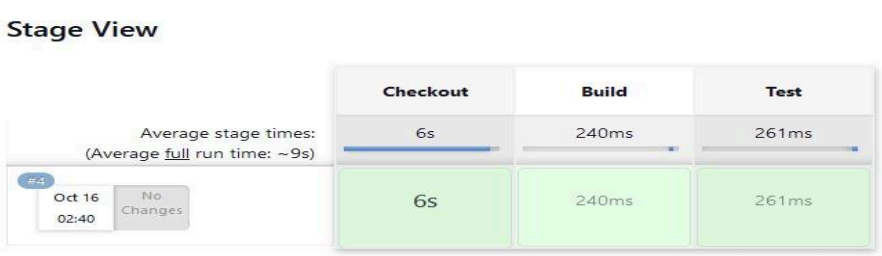



```
Checking out Revision 84cca99cc38838629d4a0561868cd30941290c1d (refs/remotes/origin/main)
 > git.exe config core.sparsecheckout # timeout=10
 > git.exe checkout -f 84cca99cc38838629d4a0561868cd30941290c1d # timeout=10
Commit message: "Add initial JavaScript files"
First time build. Skipping changelog.
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Build)
[Pipeline] echo
Building...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Test)
[Pipeline] echo
Testing...
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

- Analysis and Results:



6. Conclusion: In this case study, I successfully set up a Jenkins pipeline on an AWS EC2 instance to analyze the quality of a JavaScript file using SonarQube. The integration of Jenkins and SonarQube provides an automated approach to code quality checks, ensuring cleaner and more secure code.