Jenkins CI/CD Pipeline for Dockerized Python App on AWS

Project by
R. Bhavani

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1. Project Overview

This project contains a complete walkthrough of the CI/CD pipeline project, along with placeholders for screenshots to demonstrate each step.

- **WSL Ubuntu Terminal Integration**
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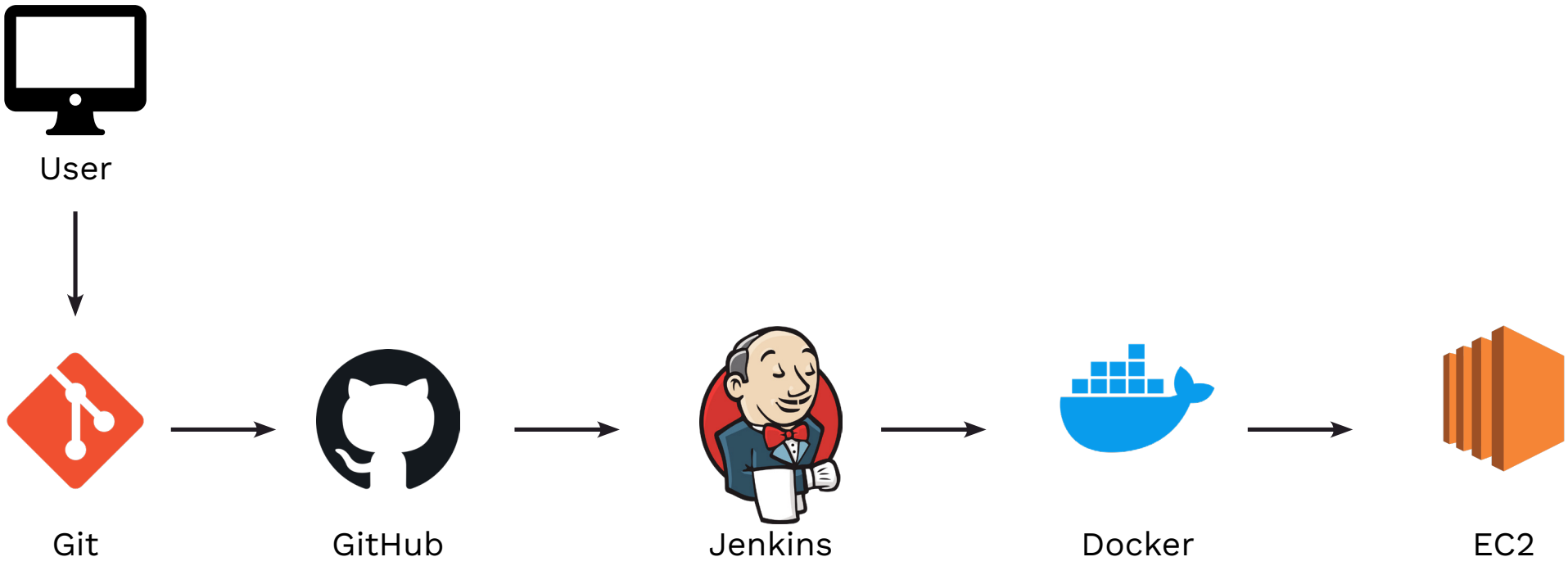
- **EC2 Instance**
- **Jenkins Setup**
- **Pipeline Run**
- **Docker**
- **Python Flask Web Application**

Below are the steps, configuration details, and screenshots demonstrating the working application.

2. Architecture Diagram



3. WSL Ubuntu Terminal Integration

- Opened and configured Ubuntu WSL Terminal.
- Fetched all necessary files:

  Ubuntu WSL → Git → Github

```
dmin@DESKTOP-6BDGARK:~$ mkdir temp
dmin@DESKTOP-6BDGARK:~$ cd temp
dmin@DESKTOP-6BDGARK:~/temp$ nano app.py
dmin@DESKTOP-6BDGARK:~/temp$ nano requirements.txt
dmin@DESKTOP-6BDGARK:~/temp$ nano Dockerfile
dmin@DESKTOP-6BDGARK:~/temp$ nano .dockerignore
dmin@DESKTOP-6BDGARK:~/temp$ nano Jenkinsfile
dmin@DESKTOP-6BDGARK:~/temp$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/dmin/temp/.git/
dmin@DESKTOP-6BDGARK:~/temp$ git add .
dmin@DESKTOP-6BDGARK:~/temp$ git commit -m "Initial Commitment"
[master (root-commit) e4681cb] Initial Commitment
 5 files changed, 60 insertions(+)
 create mode 100644 .dockerignore
 create mode 100644 Dockerfile
 create mode 100644 Jenkinsfile
 create mode 100644 app.py
 create mode 100644 requirements.txt
dmin@DESKTOP-6BDGARK:~/temp$ git remote add origin https://github.com/bhavani2909/jenkinspythonapp.git
dmin@DESKTOP-6BDGARK:~/temp$ git branch -M main
dmin@DESKTOP-6BDGARK:~/temp$ git push -u origin main
```

Image 1 : Pushing all necessary files using the Ubuntu WSL → Git → Github

4. GitHub Repository

Accessed GitHub via PAT Tokens generated to fetch all the files from the remote repository.

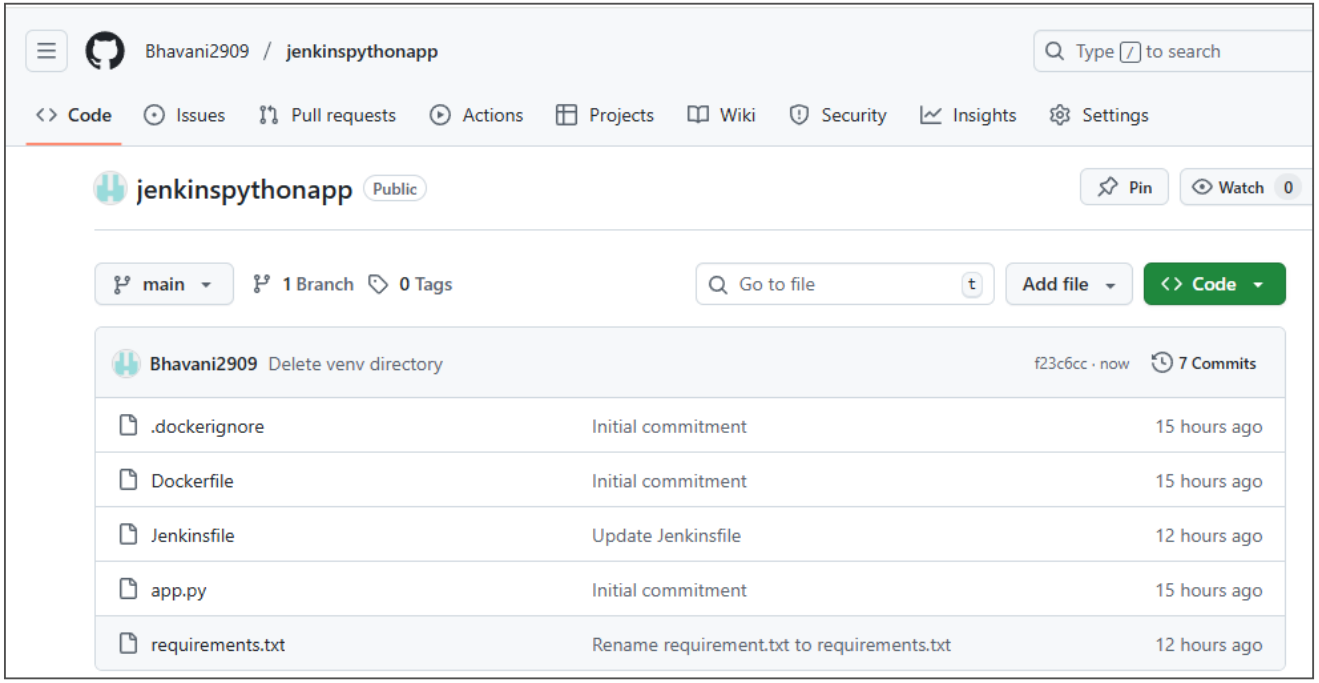


Image 2 : Repository page showing Jenkinsfile, Dockerfile, app.py, requirements.txt.

5. EC2 Instance

- Launched Amazon Linux EC2 and upgraded installation.
- Installed Java 17 for Jenkins setup.

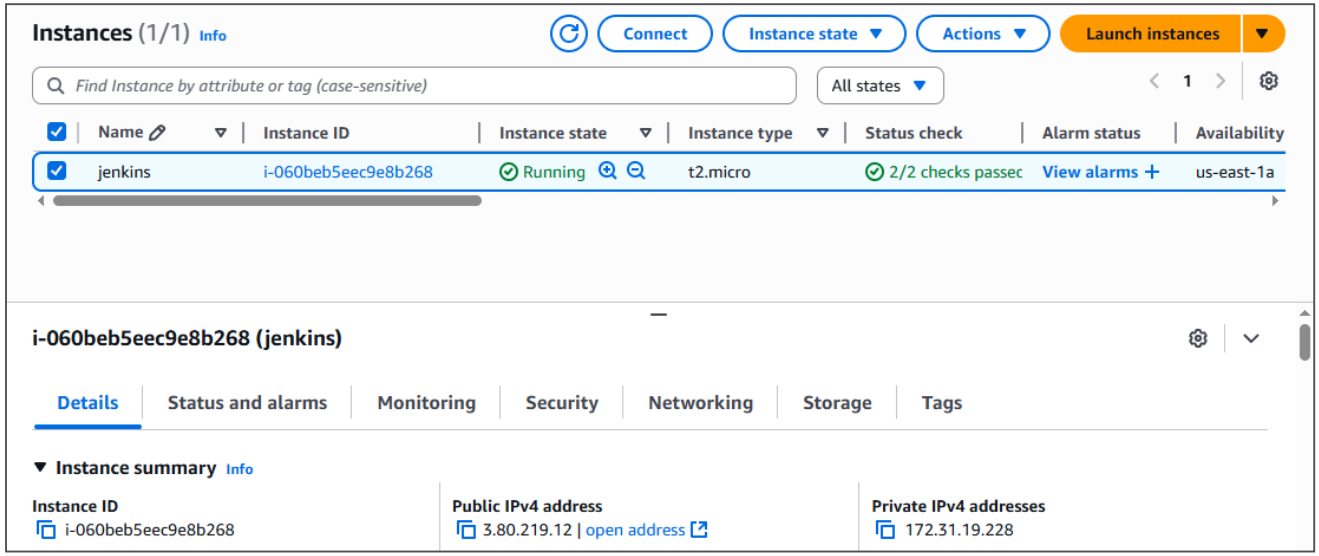


Image 3 : AWS EC2 Dashboard showing running instance.

6. Jenkins Setup

- Jenkins is installed after the configuration of Java.

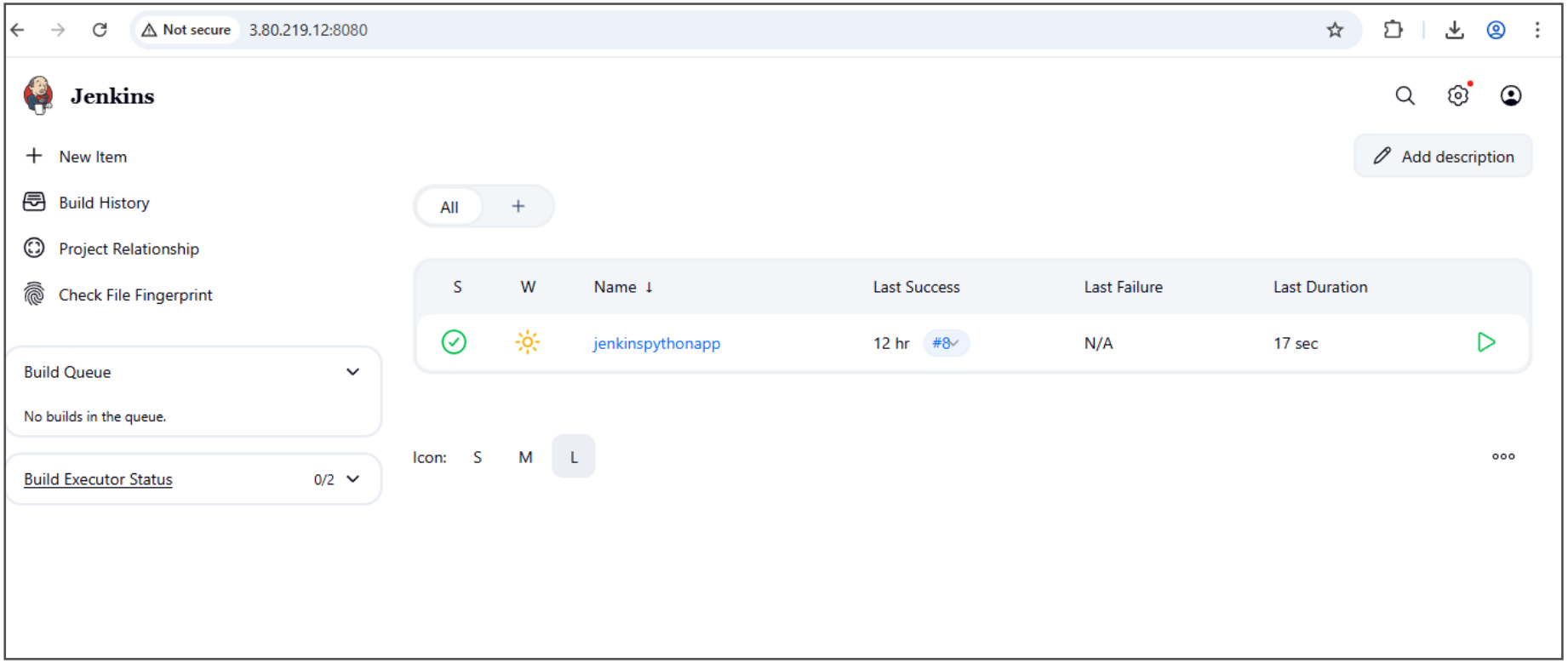


Image 4 : Jenkins job configuration with repository URL.

7. Pipeline Run

- Added a “New item” and scheduled it with the necessary node configurations.
- Ensured the built-in node is online.
- Verified the success of the console output stages : checkout → build → deploy.

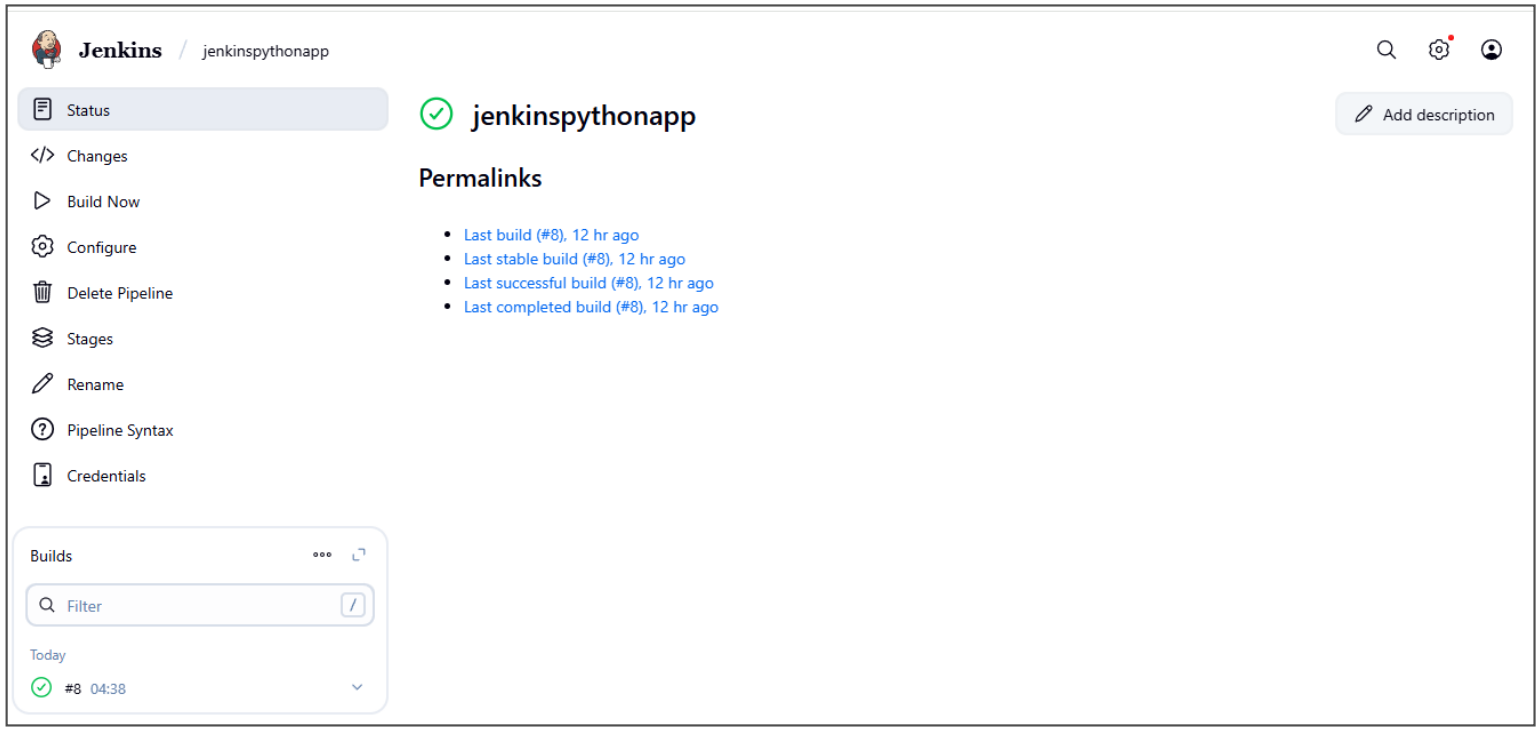


Image 5 : Jenkins console output showing successful stages (checkout → build → deploy)

Image 6 :Jenkins job success page with green checkmark.

8. Docker

- Installed and verified docker images via AWS EC2.
- The containerized and dockerized image ID is seen.

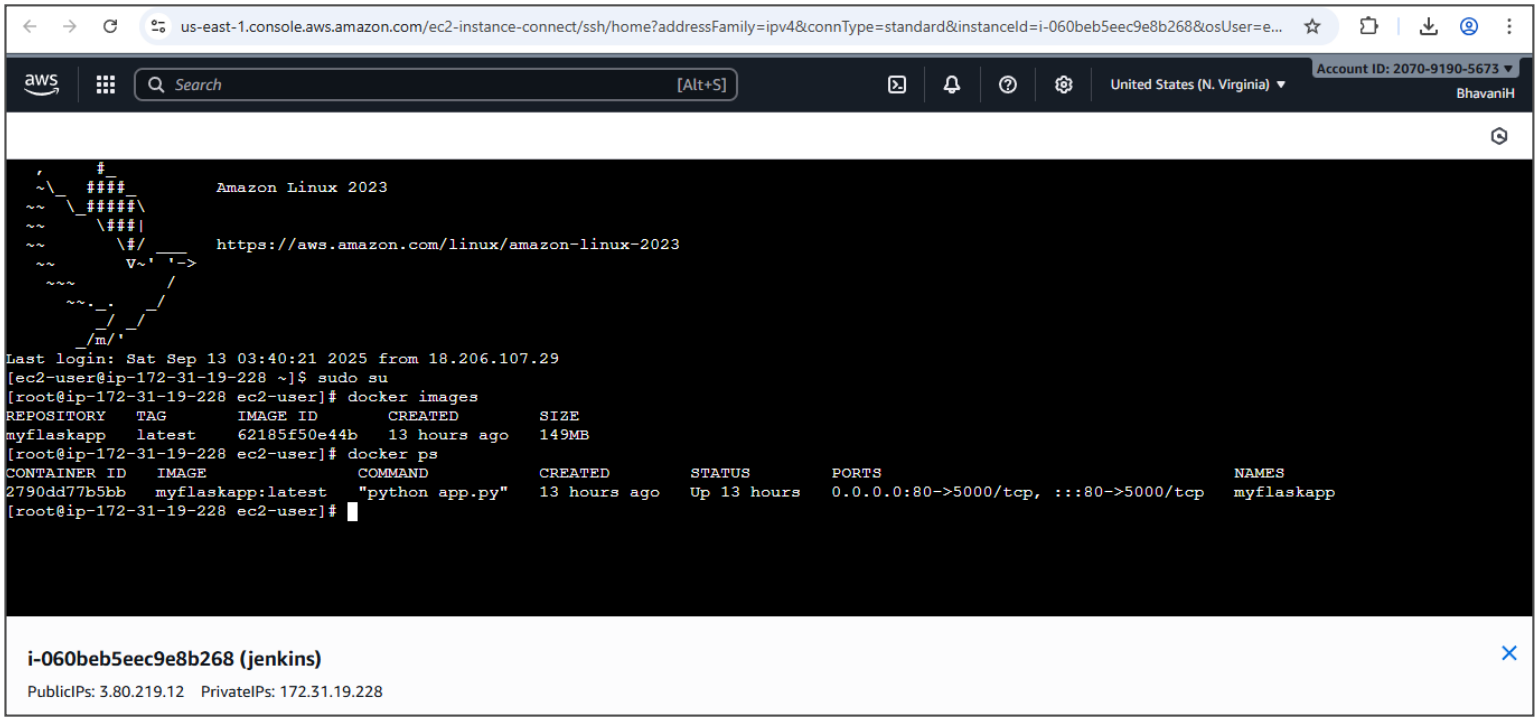


Image 7 : Terminal showing `docker images` & `docker ps` with container running.

9. Git

- Ensured that the Git is installed and configured in EC2 Terminal.

```
root@ip-172-31-86-4:~
[root@ip-172-31 ~]# yum install git -y
Loaded plugins: priorities, update-motd, upgrade-helper
amzn-main
amzn-updates
Resolving Dependencies
--> Running transaction check
---> Package git.x86_64 0:2.14.5-1.60.amzn1 will be installed
--> Processing Dependency: perl-Git = 2.14.5-1.60.amzn1 for package: git-2.14.5-1.60.amzn1.x86_64
--> Processing Dependency: perl(Term::ReadKey) for package: git-2.14.5-1.60.amzn1.x86_64
--> Processing Dependency: perl(Git::I18N) for package: git-2.14.5-1.60.amzn1.x86_64
--> Processing Dependency: perl(Git) for package: git-2.14.5-1.60.amzn1.x86_64
--> Processing Dependency: perl(Error) for package: git-2.14.5-1.60.amzn1.x86_64
--> Running transaction check
---> Package perl-Error.noarch 1:0.17020-2.9.amzn1 will be installed
---> Package perl-Git.noarch 0:2.14.5-1.60.amzn1 will be installed
---> Package perl-TermReadKey.x86_64 0:2.30-20.9.amzn1 will be installed
--> Finished Dependency Resolution

Dependencies Resolved
```

Image 8 : Git Installation.

10. Output Results

- Verified the execution with “Curl” via EC2 Terminal.
- The Python application is seen to run on the browser showing Public IP.

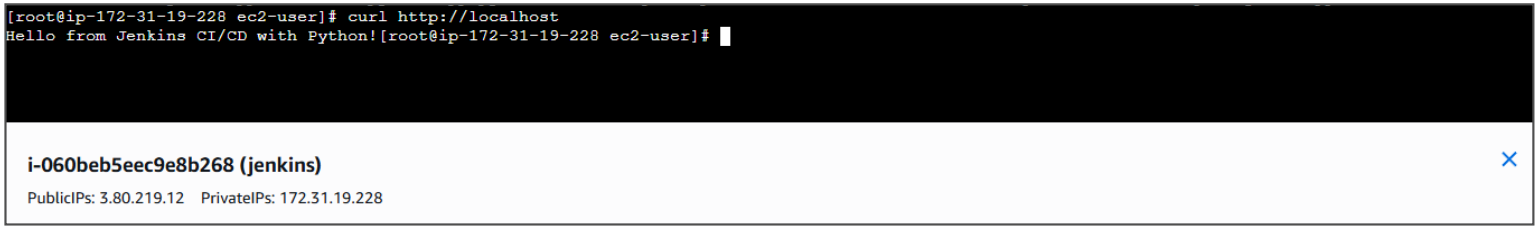


Image 9 : Terminal with `curl http://localhost` showing app response.

Image 10 : Browser showing EC2 Public IP with app running (Hello message).

Thank you!