

# CSC11004 – MẠNG MÁY TÍNH NÂNG CAO

## ĐỒ ÁN 3

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### I. Triển khai CI/CD sử dụng Git, Jenkins và Docker

Đăng ký account AWS và bắt đầu khởi tạo instances với Linux-OS

**Bước 1:** Khởi tạo Jenkins với AWS linux server

Cài đặt Git

```
sudo apt-get update  
sudo apt install git  
sudo git --version
```

```
ubuntu@ip-172-31-7-97:/$ git --version  
git version 2.43.0
```

Cài đặt docker

```
sudo apt-get update  
sudo apt install -y docker.io
```

Bắt đầu Jenkins Docker container với name volume

```
docker run -p 8080:8080 -p 50000:50000 -d -v jenkins_home:/var/jenkins_home -v  
/var/run/docker.sock:/var/run/docker.sock -v $(which docker):/usr/bin/docker jenkins/jenkins:lts
```

Sao chép password tại `/var/lib/docker/volumes/jenkins_home/_data/secrets/initialAdminPassword` và tiến hành đăng nhập

Getting Started

## Unlock Jenkins

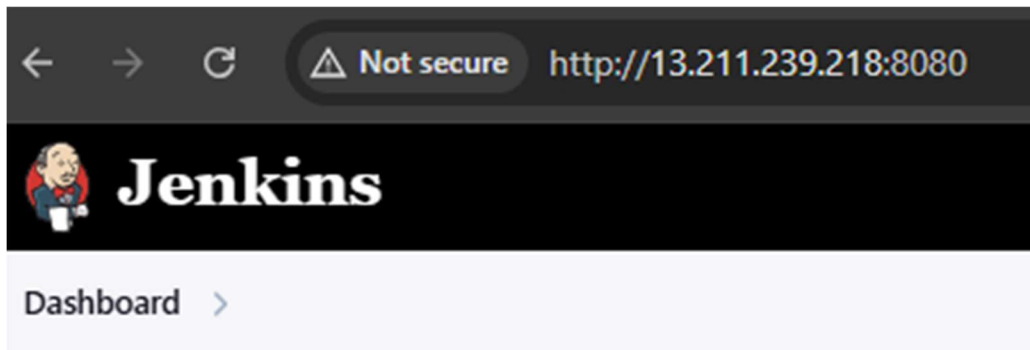
To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

```
/var/jenkins_home/secrets/initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password

Thành công cài đặt Jenkins



## Bước 2: Tạo pipeline job

### New Item

Enter an item name

DevOps

Select an item type



#### Freestyle project

Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.



#### Pipeline

Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Cho phép Github push events đến trigger pipeline

## Configure



General



Advanced Project Options



Pipeline

### Build Triggers

- ☐ Build after other projects are built ?
- ☐ Build periodically ?
- ☒ GitHub hook trigger for GITScm polling ?
- ☐ Poll SCM ?
- ☐ Quiet period ?
- ☐ Trigger builds remotely (e.g., from scripts) ?

## Cấu hình Pipeline

- Definition: Pipeline script from SCM
- SCM: Git
- Repositories:
- Credentials: click on the "Add" button to open Jenkins Credentials provider modal:
- kind: username and password
- username: your github username
- password: your github password
- Id: a unique identifier for the credentials Click "Add" and select the created credentials
- Branches to build: \*/main
- Script Path: Jenkinsfile

## Bước 3: Thêm Jenkins-Github-webhook trên github

Đăng nhập vào github bản thân và vào setting của project để cài đặt github webhook

**General**

Access

Collaborators

Moderation options

Code and automation

Branches

Tags

Rules

Actions

**Webhooks**

Environments

Codespaces

Pages

Security

Code security

Deploy keys

Secrets and variables

Integrations

GitHub Apps

Email notifications

### Webhooks / Manage webhook

Settings Recent Deliveries

We'll send a `POST` request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, `x-www-form-urlencoded`, etc). More information can be found in [our developer documentation](#).

**Payload URL \***

`http://13.211.239.218:8080/github-webhook/`

**Content type \***

`application/json`

**Secret**

**SSL verification**

By default, we verify SSL certificates when delivering payloads.

☒ Enable SSL verification ☐ Disable (not recommended)

**Which events would you like to trigger this webhook?**

☒ Just the push event.

☐ Send me everything.

☐ Let me select individual events.

#### Bước 4: Cài đặt “Nodejs/npm”, “OpenJDK8”, “Docker” trong Jenkins server

[Dashboard](#) > [Manage Jenkins](#) > [Plugins](#)

##### [NodeJS Plugin](#) 1.6.2

NodeJS Plugin executes [NodeJS](#) script as a build step.

[Report an issue with this plugin](#)

##### [Docker API Plugin](#) 3.4.1-96.v77147a\_de67f8

This plugin provides [docker-java](#) API for other plugins.

[Report an issue with this plugin](#)

##### [Docker Commons Plugin](#) 445.v6b\_646c962a\_94

Provides the common shared functionality for various Docker-related plugins.

[Report an issue with this plugin](#)

##### [Docker Pipeline](#) 580.vc0c340686b\_54

Build and use Docker containers from pipelines.

[Report an issue with this plugin](#)

##### [Docker plugin](#) 1.7.0

This plugin integrates Jenkins with [Docker](#)

[Report an issue with this plugin](#)

##### [docker-build-step](#) 2.12

This plugin allows to add various docker commands to your job as build steps.

[Report an issue with this plugin](#)

**Warning:** The currently installed plugin version may not be safe to use. Please review the following security notices:

- [CSRF vulnerability and missing permission check](#)

##### [Eclipse Temurin installer Plugin](#) 1.5

Provides an installer for the JDK tool that downloads the JDK from <https://adoptium.net>

[Report an issue with this plugin](#)

##### [openJDK-native-plugin](#) 1.8

[Report an issue with this plugin](#)

Thêm những plugin vừa cài đặt vào tool

Dashboard > Manage Jenkins > Tools

## Nodejs

### NodeJS installations

NodeJS installations ^ Edited

Add NodeJS

NodeJS

Name

nodejs

☒ Install automatically ?

Install from nodejs.org

Version

NodeJS 23.5.0

For the underlying architecture, if available, force the installation of the 32bit package. Otherwise the build will fail

☐ Force 32bit architecture

Global npm packages to install

Specify list of packages to install globally -- see npm install -g. Note that you can fix the packages version by using the syntax "packageName@version"

Global npm packages refresh hours

Duration, in hours, before 2 npm cache update. Note that 0 will always update npm cache

72

## JDK

### JDK installations

JDK installations ^ Edited

Add JDK

JDK

Name

OpenJDK8

☒ Install automatically ?

Install from adoptium.net ?

Version ?

jdk8u432-b06

Add Installer

## Maven

≡

**Maven**

Name

Maven3

☒ Install automatically ?

≡

**Install from Apache**

Version

3.9.9

Add Installer ▾

## Docker

Docker installations

Docker installations ^ Edited

Add Docker

≡

**Docker**

Name

Docker

☒ Install automatically ?

≡

**Download from docker.com**

Docker version ?

latest

Add Installer ▾



Add Docker

Thêm credentials docker hub với:

- Username: your docker username
- Password: your docker password

## Global credentials (unrestricted)

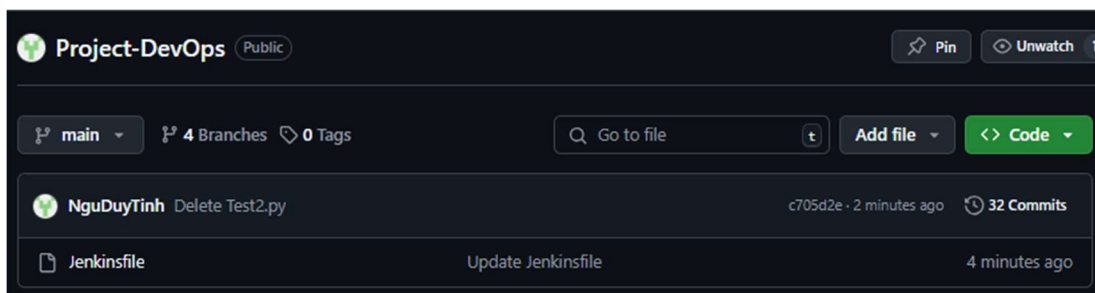
Credentials that should be available irrespective of domain specification to requirements matching.

ID	Name
 <a href="#">docker-hub</a>	21120572/***** (dockerhub)
 <a href="#">githubcredentials</a>	21120572@student.hcmus.edu.vn/***** (github creds)

**Bước 5:** Tạo Jenkinsfile cho ứng dụng và push lên repo github

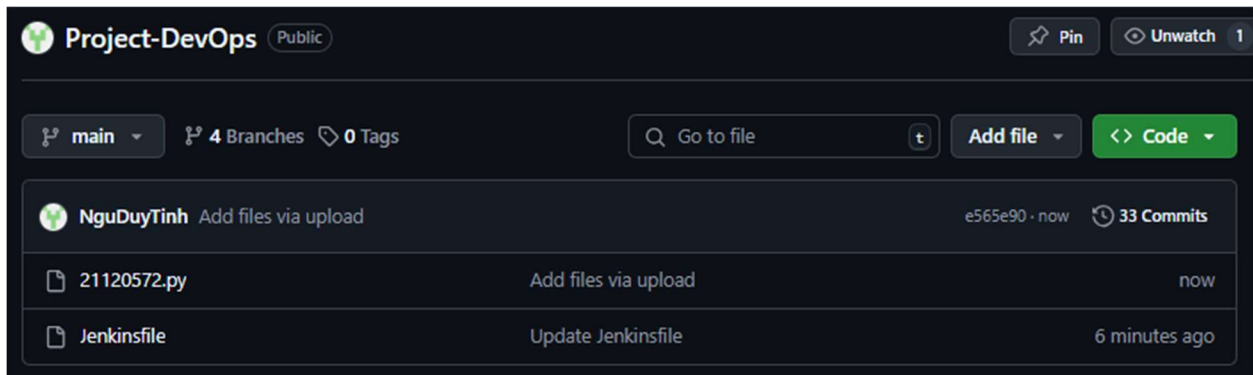
Nội dung file Jenkins (Mục đích test)

```
1  pipeline {
2      agent any
3      tools {
4          nodejs 'nodejs'
5      }
6      stages {
7          stage('Build') {
8              steps {
9                  //sh 'npm install'
10                 // sh 'npm run build'
11                 echo 'Build'
12             }
13         }
14
15         stage('Test') {
16             steps {
17                 // sh 'npm install'
18                 // sh 'npm run build'
19                 echo 'Test1'
20             }
21         }
22     }
23 }
```



The screenshot shows the GitHub interface for a repository named "Project-DevOps" which is public. At the top, there are buttons for "Pin" and "Unwatch" with a count of 1. Below this, the repository details show "main" as the selected branch, with "4 Branches" and "0 Tags" available. A search bar labeled "Go to file" and buttons for "Add file" and "Code" are present. The commit history section shows a recent commit by "NguDuyTinh" titled "Delete Test2.py" made 2 minutes ago with commit hash "c705d2e" and 32 total commits. Below the commit list, a file named "Jenkinsfile" is shown with the message "Update Jenkinsfile" and a timestamp of "4 minutes ago".

Test khi push code mới lên



Build “DevOps” pipeline Jenkins

✓ #4 (Dec 18, 2024, 7:16:28 PM)



Started by GitHub push by NguDuyTinh



This run spent:

- 6.8 sec waiting;
- 3.6 sec build duration;
- 10 sec total from scheduled to completion.



Revision: e565e903218790f0f1a85f0ca3861da400103c1d

Repository: <https://github.com/NguDuyTinh/Project-DevOps.git>

- refs/remotes/origin/main



Changes

1. Add files via upload ([details](#) / [githubweb](#))

✓ < Build #4

▶ Rebuild

📄 Console

⚙️ Configure

Pipeline



Details

🕒 Started 1 min 11 sec ago

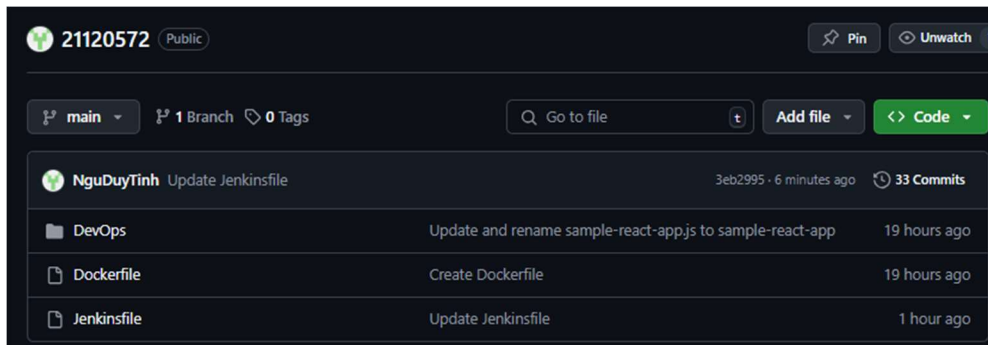
⌚ Queued 6.8 sec

🕒 Took 3.6 sec

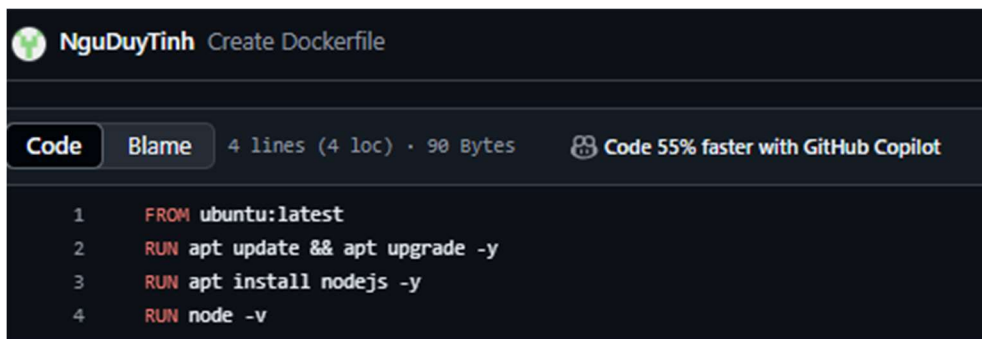


## Bước 6: Docker Build và Push

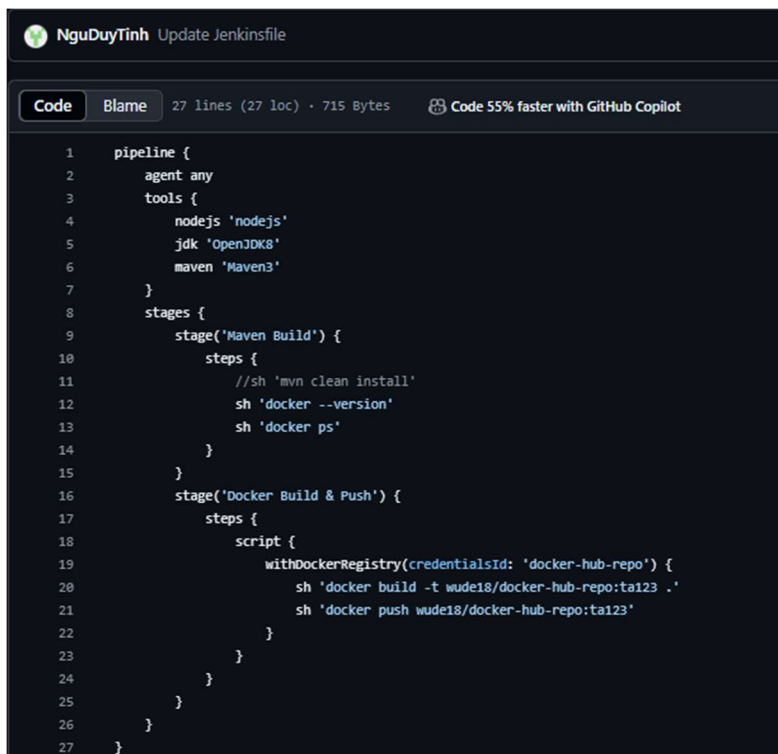
Chuẩn bị github: push Dockerfile và Jenkinsfile



### Dockerfile



### Jenkinsfile



Adduser docker groups

```
sudo usermod -aG docker $USER
```

```
newgrp docker
```

Sửa quyền đọc ghi

```
sudo chmod 666 /var/run/docker.sock
```

Thành công Build và Push

✓ < Build #2

Success 8 min 50 sec ago in 1 min 11 sec

✓ Checkout SCM

✓ Tool Install

✓ Maven Build

✓ Docker Build & Push

Stage 'Docker Build & Push'

🕒 Started 8 min 47 sec ago

⌚ Queued 0 ms

⌚ Took 1 min 6 sec

🟢 Success

🔗 [View as plain text](#)

✓ **nodejs**

Use a tool from a predefined Tool Installation

✓

**Fetches the environment variables for a given tool in a list of 'FOO=bar' strings suitable for the withEnv step.**

✓

**OpenJDK8**

Use a tool from a predefined Tool Installation

✓

**Fetches the environment variables for a given tool in a list of 'FOO=bar' strings suitable for the withEnv step.**

✓

**Maven3**

Use a tool from a predefined Tool Installation

✓

**Fetches the environment variables for a given tool in a list of 'FOO=bar' strings suitable for the withEnv step.**

✓

**docker build -t wude18/docker-hub-repo:ta123 .**

Shell Script

✓

**docker push wude18/docker-hub-repo:ta123**

Shell Script

wude18/docker-hub-repo 📄

Last pushed 1 minute ago

[Add a description](#) ✎ 🔔 INCOMPLETE

[Add a category](#) ✎ 🔔 INCOMPLETE

## Tags

This repository contains 1 tag(s).

Tag	OS	Type	Pulled	Pushed
ta123	🐳	Image	—	a few seconds ago

[See all](#)

## II. Nguồn tham khảo

<https://jennykibiri.hashnode.dev>