



Jenkins

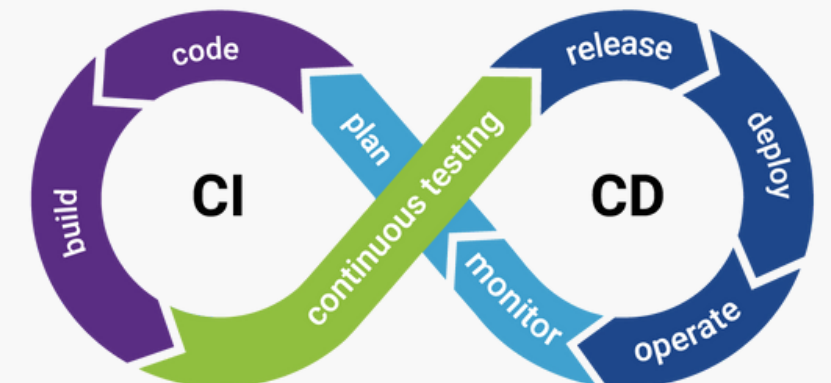


Prepared by Group 13

Linux Operating System and Applications

CI/CD in Action: Jenkins for Automated Builds

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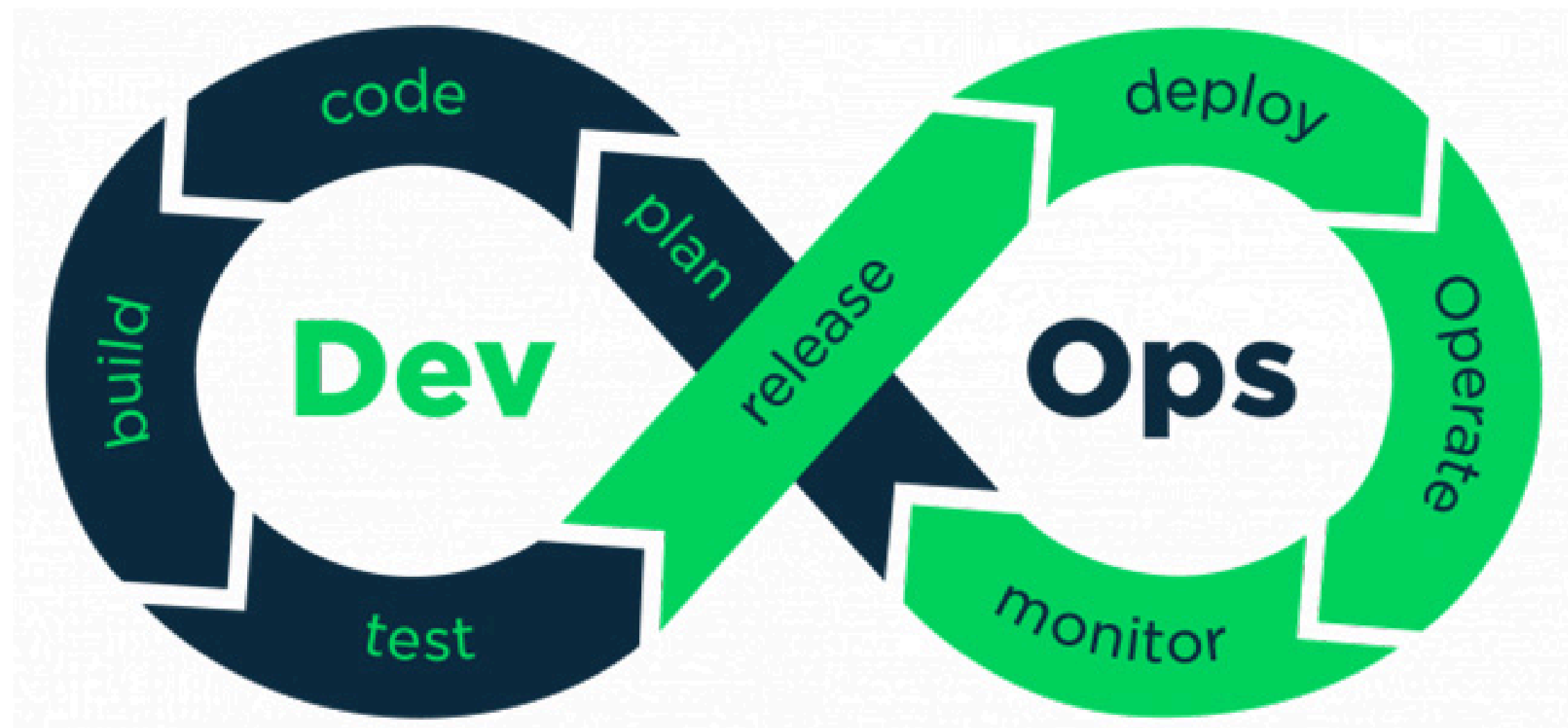
Demo

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Q & A



Introduction to CI/CD



What is CI/CD?



Continuous Integration - CI

Definition: *The practice of merging all developers' working copies to a shared mainline several times a day.*



What is CI/CD?



Continuous Integration - CI

Core Principles/Practices:

- **Version Control:** All code in a shared repository (e.g., Git).
- **Automated Builds:** Every commit triggers a build process.
- **Automated Tests:** Unit tests, integration tests run automatically.
- **Early Feedback:** Developers get immediate feedback on integration issues.



What is CI/CD?



Continuous Delivery

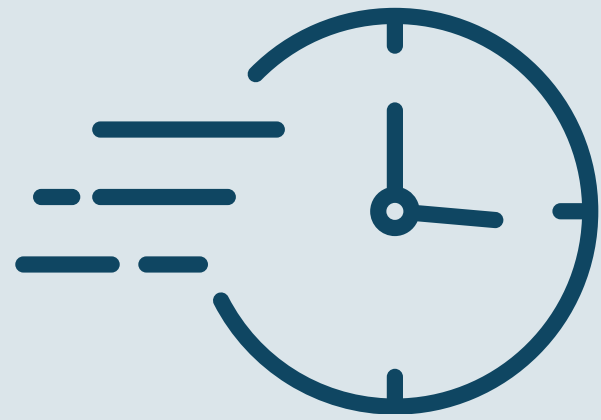
- Code is always in a deployable state
- Automated pipeline up to a production-ready stage
- Manual step for final deployment to production



Continuous Deployment

- Automated deployment to production for every successful change
- No human intervention after the commit
- Requires high confidence in automated testing

Why CI/CD?



Faster Development Cycles

- Faster Release Cycles
- Faster Feedback Loops
- Accelerated Market Delivery



Improved Coding Quality

- Enhanced Developer Experience
- Reduced Risks and Errors
- Log and Monitoring



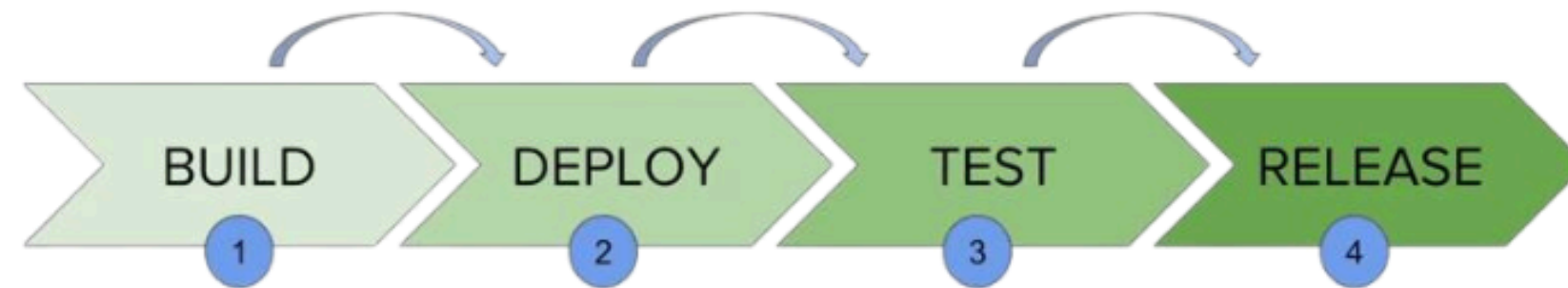
Reduced Costs

- Reduce time costs, effort costs.
- Focus on Developing
- Minimized System Downtime

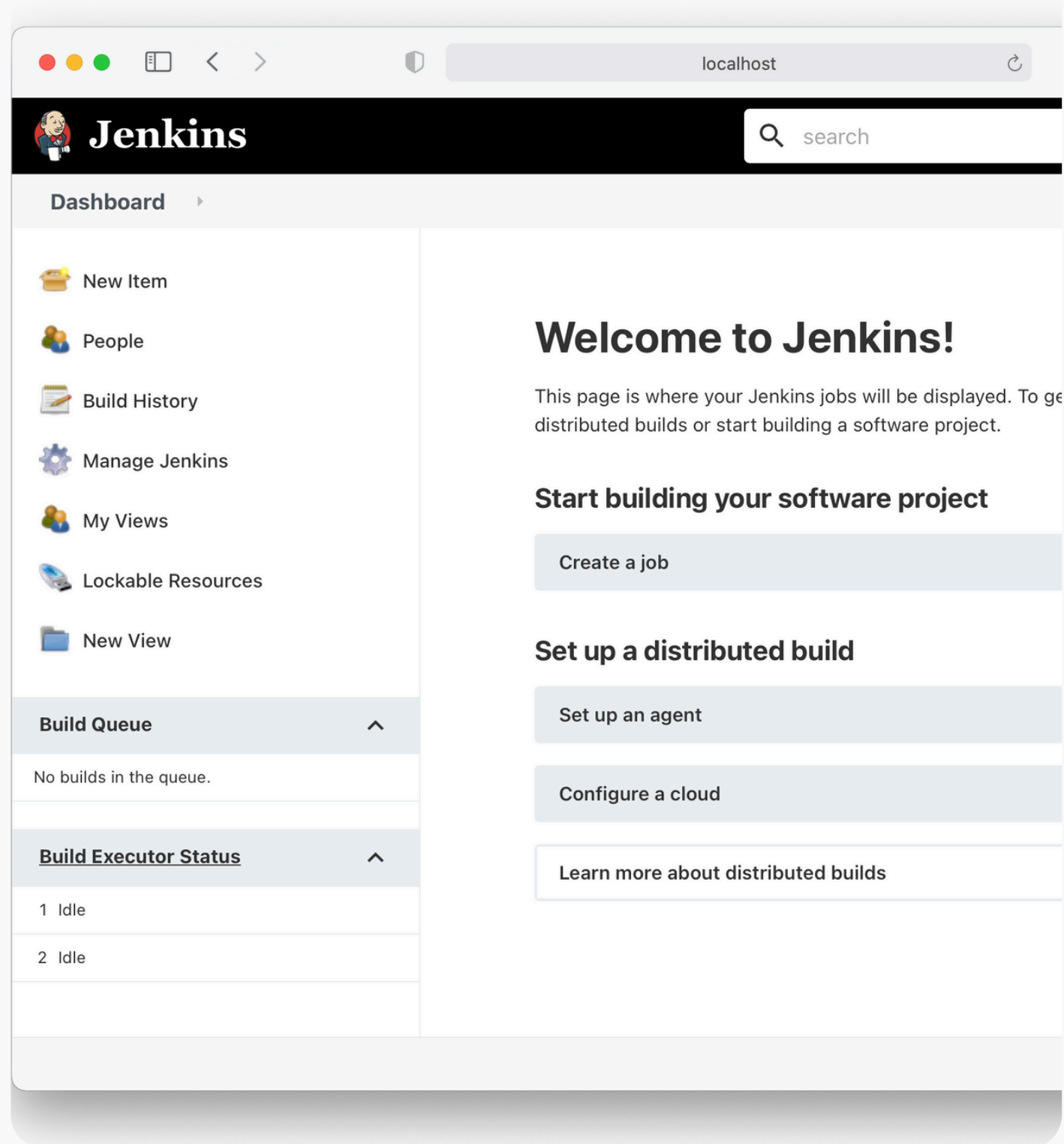
Introducing Jenkins



Jenkins



Why Jenkins?



What is Jenkins?

- An open-source automation server
- Written in Java
- Facilitates automation of the software development process
- Widely used for building, testing, and deploying software

Key Role in CI/CD:

- Orchestrates the entire CI/CD pipeline
- Acts as the central hub for automated workflows

Jenkins' Architecture



Plugins

Thousands of plugins for integration with various tools (Git, Maven, Docker, cloud providers, etc.)

Master-agent model

Jenkins Master: Schedules jobs, monitors agents, and stores configurations.

Jenkins Agents (Nodes): Execute the actual build jobs. Allows parallel builds and offloading work from master.



Pipeline as Code

Define your entire CI/CD pipeline in **Jenkinsfile**

Stored in version control (such as **Git**)

Job Configuration

Freestyle projects, Maven projects, Pipeline projects
SCM (Source Code Management), build steps, post-build actions.





Setting up Jenkins

<https://www.jenkins.io/doc/book/installing/>



Prerequisites



Installing Java - OpenJDK 21

```
sudo apt update
```

```
sudo apt install fontconfig openjdk-21-jre
```

```
java -version
```

```
openjdk version "21.0.3" 2024-04-16
```

```
OpenJDK Runtime Environment (build  
21.0.3+11-Debian-2)
```

```
OpenJDK 64-Bit Server VM (build 21.0.3+11-  
Debian-2, mixed mode, sharing)
```

Installing Jenkins

```
21-76:~$ sudo wget -O /etc/apt/keyrings/jenkins-
kins.io/debian-stable/jenkins.io-2023.key
9:15-- https://pkg.jenkins.io/debian-stable/j
kins.io (pkg.jenkins.io)... 146.75.46.133, 2a0
.jenkins.io (pkg.jenkins.io)|146.75.46.133|:44
, awaiting response... 200 OK
K) [application/pgp-keys]
apt/keyrings/jenkins-keyring.asc'

/j 100%[=====>] 3.10K --.-KB/
16 (42.3 MB/s) - '/etc/apt/keyrings/jenkins-ke

21-76:~$ echo "deb [signed-by=/etc/apt/keyring
kins.io/debian-stable binary/ | sudo tee \
s.list.d/jenkins.list > /dev/null
21-76:~$ sudo apt-get update
outheast-1.ec2.archive.ubuntu.com/ubuntu noble
outheast-1.ec2.archive.ubuntu.com/ubuntu noble
outheast-1.ec2.archive.ubuntu.com/ubuntu noble
```

Adding key and repository to your system

```
sudo wget -O /etc/apt/keyrings/jenkins-
keyring.asc \
https://pkg.jenkins.io/debian-
stable/jenkins.io-2023.key
echo "deb [signed-
by=/etc/apt/keyrings/jenkins-keyring.asc]" \
https://pkg.jenkins.io/debian-stable binary/
| sudo tee \
/etc/apt/sources.list.d/jenkins.list >
/dev/null
```

Installing Jenkins

ing 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](#))

```
/var/lib/jenkins/secrets/initialAdminPassword
```

Please copy the password from either location

Administrator password

Installing Jenkins

```
sudo apt-get update
```

```
sudo apt-get install jenkins
```

First launch setup

```
sudo cat
```

```
/var/lib/jenkins/secrets/initialAdminPassword
```

Then go to <http://localhost:8080>

Installing Jenkins

Started

Customize Jenkins

Plugins extend Jenkins with additional features to support r

Install suggested plugins

Install plugins the Jenkins
community finds most useful.

Select plugins install

Select and install
suitable for your

516.1

**Installing suggested plugins
(recommended)**

OR

Manually select plugins to install

Installing Jenkins

Create First Admin

Username

Password

Confirm password

Full name

**Make your first admin credentials
(don't lose your password!)**



Getting Started

Jenkins is ready!

Your Jenkins setup is complete.

Start using Jenkins



Alternatively...

[> User Documentation Home](#)

User Handbook

- [User Handbook Overview](#)
- [Installing Jenkins](#)
 - [Docker](#)
 - [Kubernetes](#)
 - [Linux](#)
 - [macOS](#)
 - [Windows](#)
 - [Other Systems](#)
 - [WAR file](#)
 - [Other Servlet Containers](#)
 - [Offline Installations](#)
 - [Initial Settings](#)
- [Platform Information](#)
- [Using Jenkins](#)
- [Pipeline](#)
- [Blue Ocean](#)
- [Managing Jenkins](#)
- [Securing Jenkins](#)
- [System Administration](#)
- [Scaling Jenkins](#)
- [Troubleshooting Jenkins](#)
- [Glossary](#)

Docker

[Docker](#) is a platform for running applications in an isolated environment called a "container" (or Docker container). Applications like Jenkins can be downloaded as read-only "images" (or Docker images), each of which is run in Docker as a container. A Docker container is a "running instance" of a Docker image. A Docker image is stored permanently, based on when image updates are published, whereas containers are stored temporarily. Learn more about these concepts in [Getting Started, Part 1: Orientation and setup](#) in the Docker documentation.

Due to Docker's fundamental platform and container design, a Docker image for a given application, such as Jenkins, can be run on any supported operating system or cloud service also running Docker. Supported operating systems include macOS, Linux and Windows, and supported cloud services include AWS and Azure.

Installing Docker

To install Docker on your operating system, follow the instructions in the [Guided Tour prerequisites](#).

Alternatively, visit [Docker Hub](#), and select the **Docker Community Edition** suitable for your operating system or cloud service. Follow the installation instructions on their website.



If you are installing Docker on a Linux-based operating system, ensure you configure Docker so it can be managed as a non-root user. Read more about this in Docker's [Post-installation steps for Linux](#) page of their documentation. This page also contains information about how to configure Docker to start on boot.

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Demo








Tạo Jenkins Job CI

 **hcmus-linux-and-application-jenkins** Public

 Pin


 Watch

 Fork 0 ▾

 Star 0 ▾

 **main** ▾


 Branches

 Tags

🔍 Go to file

⌕

Add file ▾

 Code ▾

About ⚙

		🕒 118 Commits
📁	Jenkinsfile	
📁	nginx	
📁	script	
📁	src_web	
📄	.gitignore	
📄	Dockerfile	
📄	README.md	
📄	package-lock.json	
📄	package.json	

About

No description, website, or topics provided.

- 📖 Readme
- 🔔 Activity
- ☆ 0 stars
- 👁 0 watching
- 🔗 0 forks

Releases

No releases published
[Create a new release](#)

Packages

No packages published
[Publish your first package](#)

Languages



📖 README

✎



Interactive Demo

<http://demojenkins.ddns.net:8080>





Thank you

