Introduction to Jenkins

Jenkins is an open-source automation server used to automate different stages of the software development process such as **building, testing, and deploying applications.** It helps developers and DevOps teams to integrate changes easily and deliver updates quickly and reliably.

Jenkins works based on the concept of Continuous Integration (CI) and Continuous Delivery (CD).

- **Continuous Integration (CI) means that whenever a developer makes changes in the code, Jenkins automatically builds and tests it to ensure that the code is working properly.**

- **Continuous Delivery (CD) means Jenkins can also deploy the tested code automatically to production or staging environments, reducing manual work.**

Jenkins supports integration with hundreds of plugins, which allow it to work with almost every popular tool in the DevOps lifecycle—like Git, Docker, Kubernetes, Maven, Gradle, and many more.

It provides a web-based dashboard where you can easily create, configure, and monitor jobs or pipelines. These pipelines define the steps your application needs to go through—from writing code to deployment.

With Jenkins, teams can:

- Automate repetitive tasks

- Detect issues early in the development cycle

- Improve software quality

- Speed up delivery

Jenkins is written in Java and can run on major operating systems like Windows, macOS, and Linux. It can be installed easily or run as a Docker container.

💼 Installing Jenkins on Ubuntu

1. Update Your System

Before installing anything, make sure your system is up to date.

sudo apt update

sudo apt upgrade -y

2. Install Java

Jenkins requires **Java (JDK)** to run. Install OpenJDK 11 or 17.

sudo apt install openjdk-17-jdk -y

✅ **Check Java version**

java -version

You should see an output showing Java 17 (or 11) installed.

3. Add Jenkins Repository

We need to add the Jenkins official repository so we can download and install Jenkins from it.

Step 1: Add Jenkins key:

**sudo wget -O /etc/apt/keyrings/jenkins-keyring.asc **

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

Step 2: Add the Jenkins repository to your system sources:

**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

4. Install Jenkins

Now update your system again and install Jenkins.

sudo apt update

sudo apt install jenkins
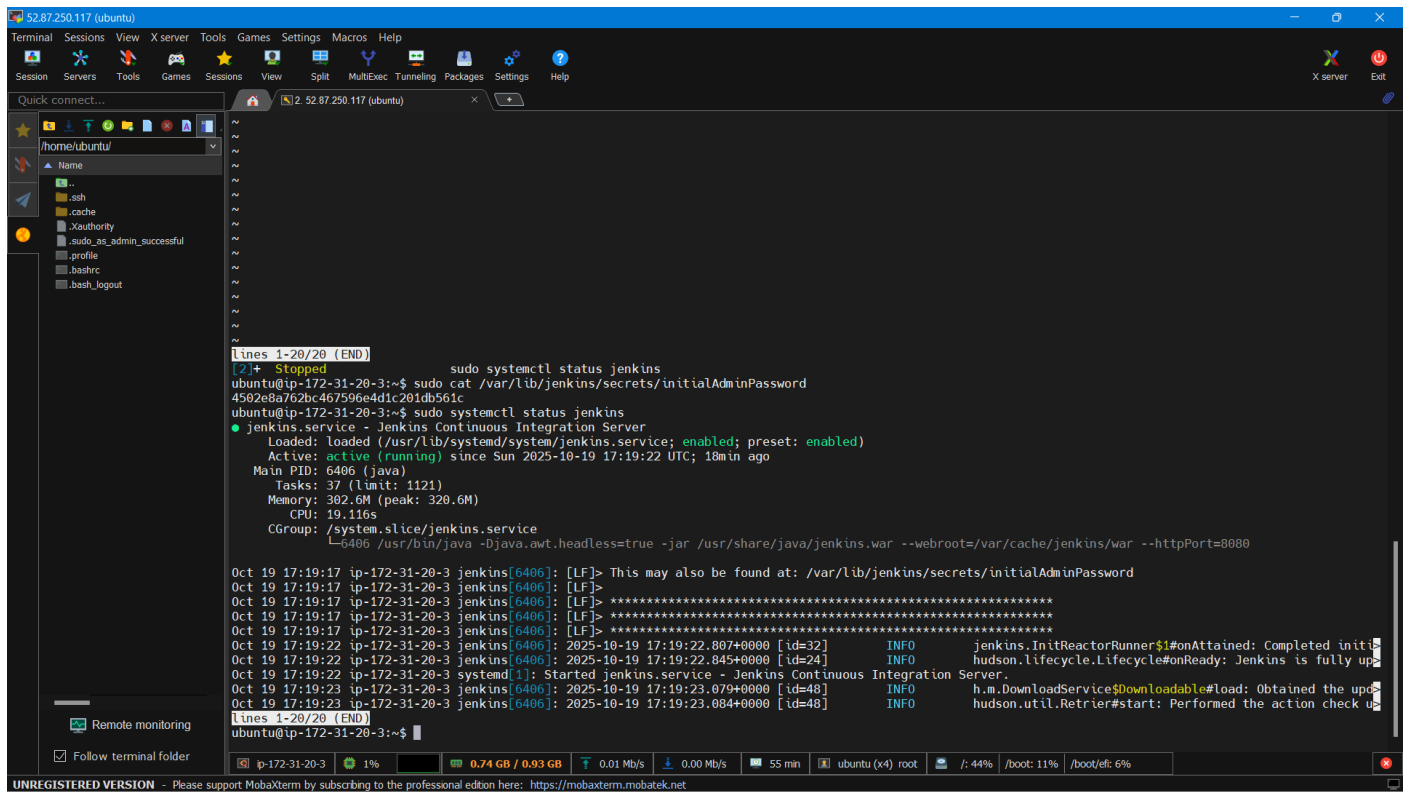
5. Start and Enable Jenkins Service

After installation, start the Jenkins service and enable it to start automatically on boot.

sudo systemctl start jenkins

sudo systemctl enable Jenkins

✅ **Check if Jenkins is running**

sudo systemctl status Jenkins

If it shows "active (running)", Jenkins is successfully running.

6. Allow Jenkins Port in Firewall

By default, Jenkins runs on **port 8080**.
You need to allow this port through the firewall.

sudo ufw allow 8080

sudo ufw enable

sudo ufw status

7. Access Jenkins in Browser

Now open your web browser and go to:

👉 **http://your_server_ip_or_domain:8080**
(Example: http://localhost:8080 or http://192.168.1.10:8080)

8. Unlock Jenkins

When you open Jenkins for the first time, it will ask for an **administrator password**.

To get the password, run this command:

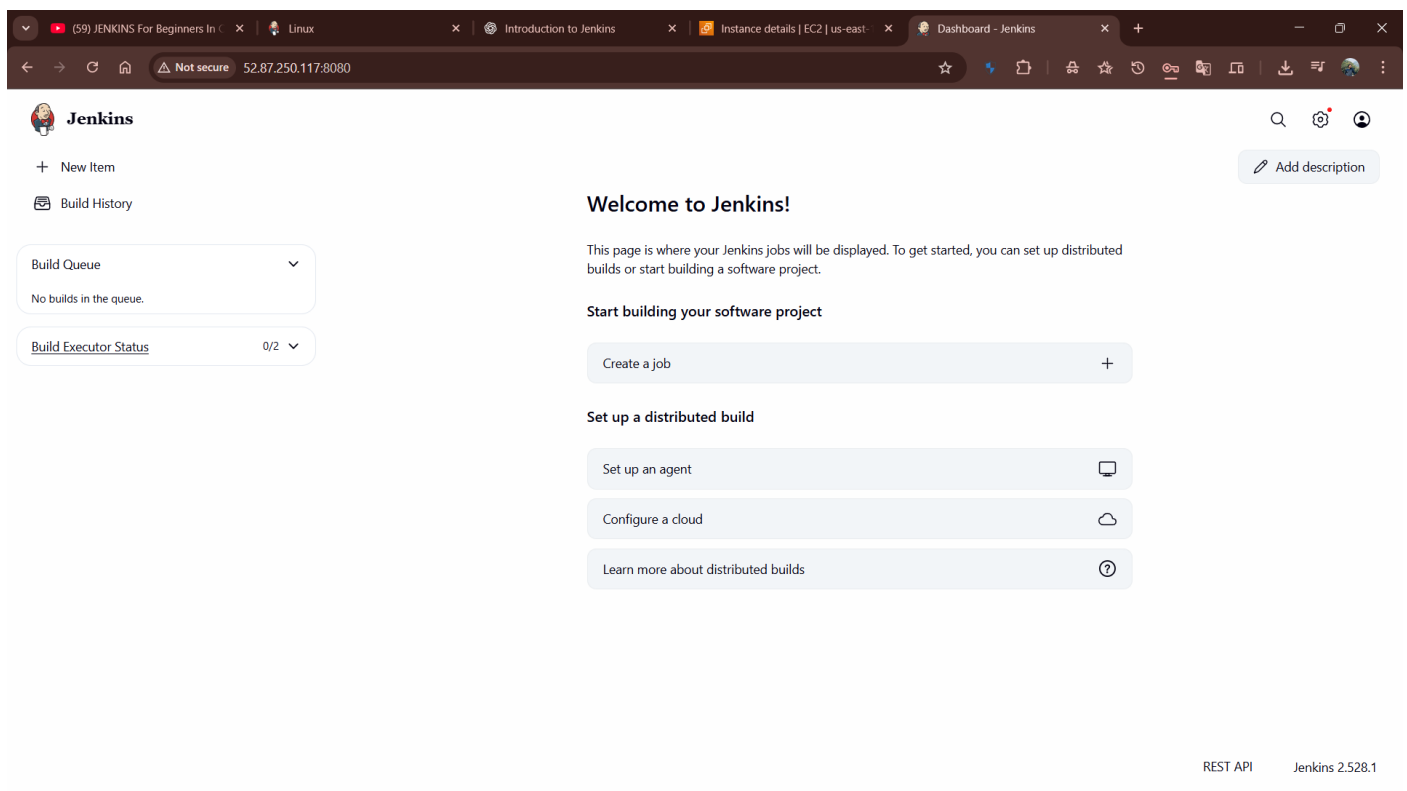**sudo cat /var/lib/jenkins/secrets/initialAdminPassword**

Copy the password shown in the terminal and paste it into the Jenkins setup page.
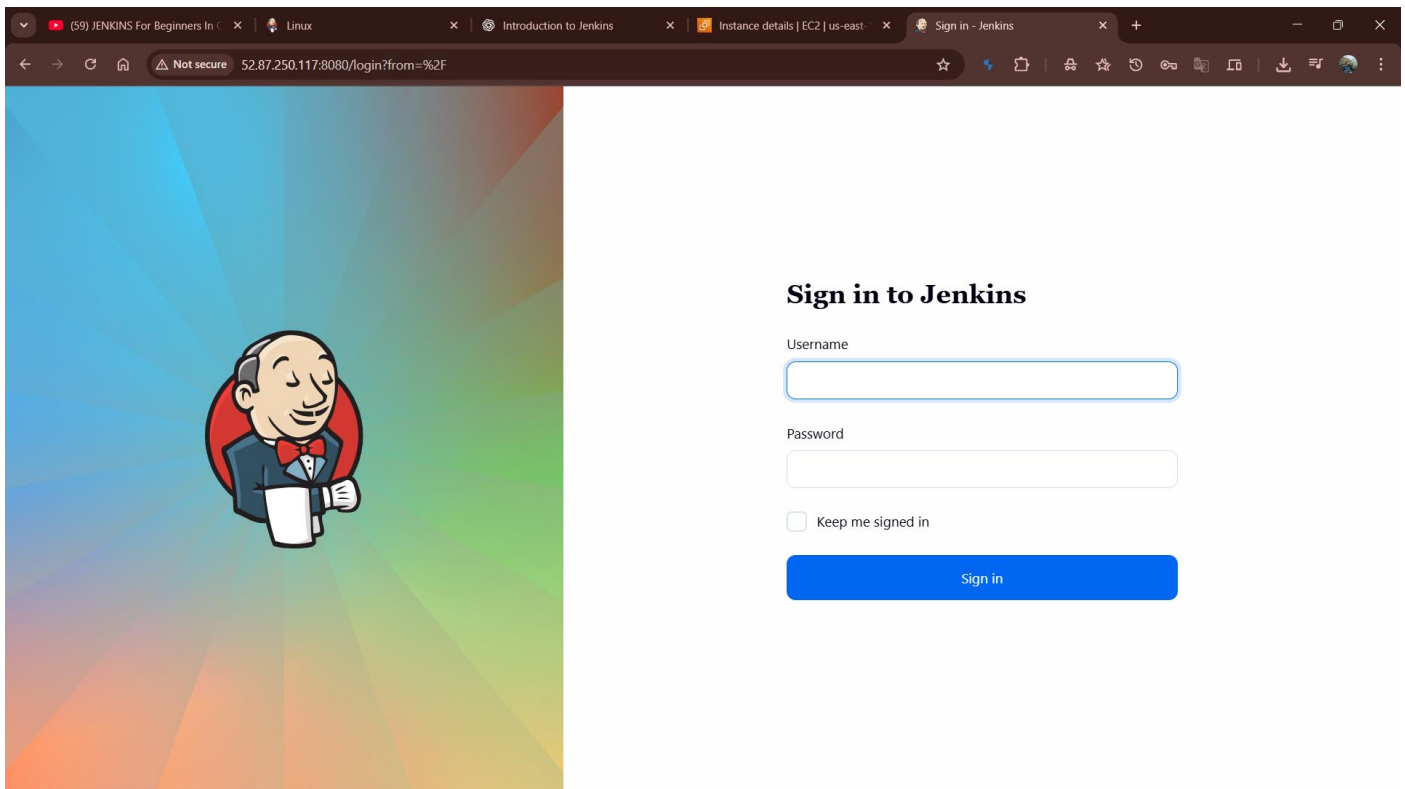
9. Install Suggested Plugins

After logging in, Jenkins will ask to:

- Install suggested plugins (recommended)

- Create an admin user

- Set up instance configuration

Follow the on-screen steps to complete setup.

10. Jenkins is Ready 🎉

After setup, Jenkins Dashboard will open.
Now you can:

- Create new jobs

- Integrate with GitHub

- Automate builds and deployments

📃 Summary of Commands

Step	Command
Update System	sudo apt update && sudo apt upgrade -y
Install Java	sudo apt install openjdk-17-jdk -y
Add Jenkins Key	`curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
Add Repository	`echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] https://pkg.jenkins.io/debian-stable binary/
Install Jenkins	sudo apt update && sudo apt install jenkins -y
Start Jenkins	sudo systemctl start jenkins

Step	Command
Enable Jenkins	sudo systemctl enable jenkins
Check Status	sudo systemctl status jenkins
Allow Port 8080	sudo ufw allow 8080
Get Admin Password	sudo cat /var/lib/jenkins/secrets/initialAdminPassword