

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
```

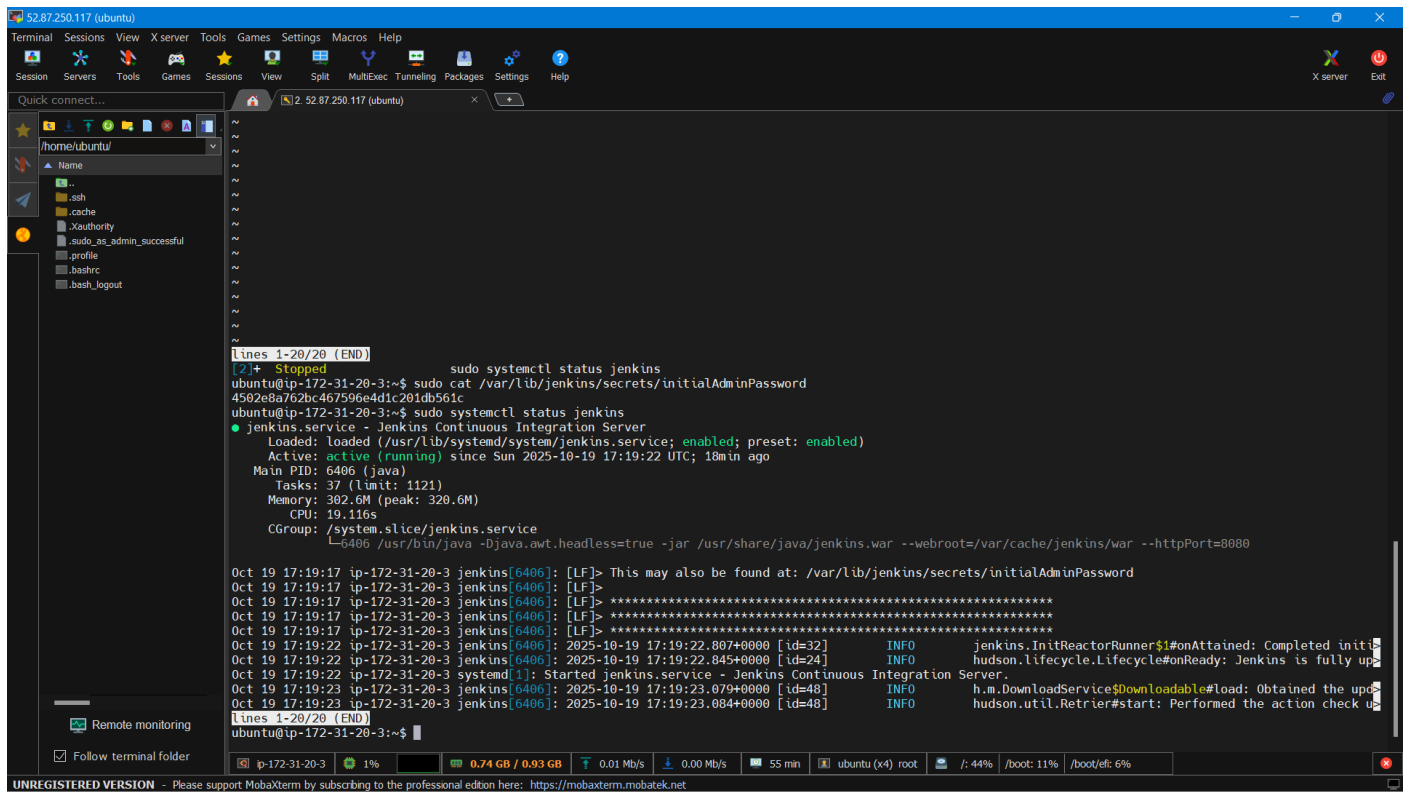
5. Start and Enable Jenkins Service

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
```



```
52.87.250.117 (ubuntu)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Quick connect...
/home/ubuntu/
Name
.ssh
.cache
.Xauthority
.sudo_as_admin_successful
.profile
.bashrc
.bash_logout
lines 1-20/20 (END)
[2] Stopped sudo systemctl status jenkins
ubuntu@ip-172-31-20-3:~$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
4502e8a762bc467596e4d1c201db561c
ubuntu@ip-172-31-20-3:~$ sudo systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/usr/lib/systemd/system/jenkins.service; enabled; preset: enabled)
   Active: active (running) since Sun 2025-10-19 17:19:22 UTC; 18min ago
     Main PID: 6406 (java)
       Tasks: 37 (limit: 1121)
      Memory: 302.6M (peak: 320.6M)
         CPU: 19.116s
        CGroup: /system.slice/jenkins.service
                └─6406 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Oct 19 17:19:17 ip-172-31-20-3 jenkins[6406]: [LF]> This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Oct 19 17:19:17 ip-172-31-20-3 jenkins[6406]: [LF]>
Oct 19 17:19:17 ip-172-31-20-3 jenkins[6406]: [LF]> *****
Oct 19 17:19:17 ip-172-31-20-3 jenkins[6406]: [LF]> *****
Oct 19 17:19:17 ip-172-31-20-3 jenkins[6406]: [LF]> *****
Oct 19 17:19:22 ip-172-31-20-3 jenkins[6406]: 2025-10-19 17:19:22.807+0000 [id=32] INFO jenkins.InitReactorRunner$1#onAttained: Completed initialization
Oct 19 17:19:22 ip-172-31-20-3 jenkins[6406]: 2025-10-19 17:19:22.845+0000 [id=24] INFO hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
Oct 19 17:19:22 ip-172-31-20-3 systemd[1]: Started jenkins.service - Jenkins Continuous Integration Server.
Oct 19 17:19:23 ip-172-31-20-3 jenkins[6406]: 2025-10-19 17:19:23.079+0000 [id=48] INFO h.m.DownloadService$Downloadable#load: Obtained the update center
Oct 19 17:19:23 ip-172-31-20-3 jenkins[6406]: 2025-10-19 17:19:23.084+0000 [id=48] INFO hudson.util.Retrier#start: Performed the action check update
lines 1-20/20 (END)
ubuntu@ip-172-31-20-3:~$
```

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

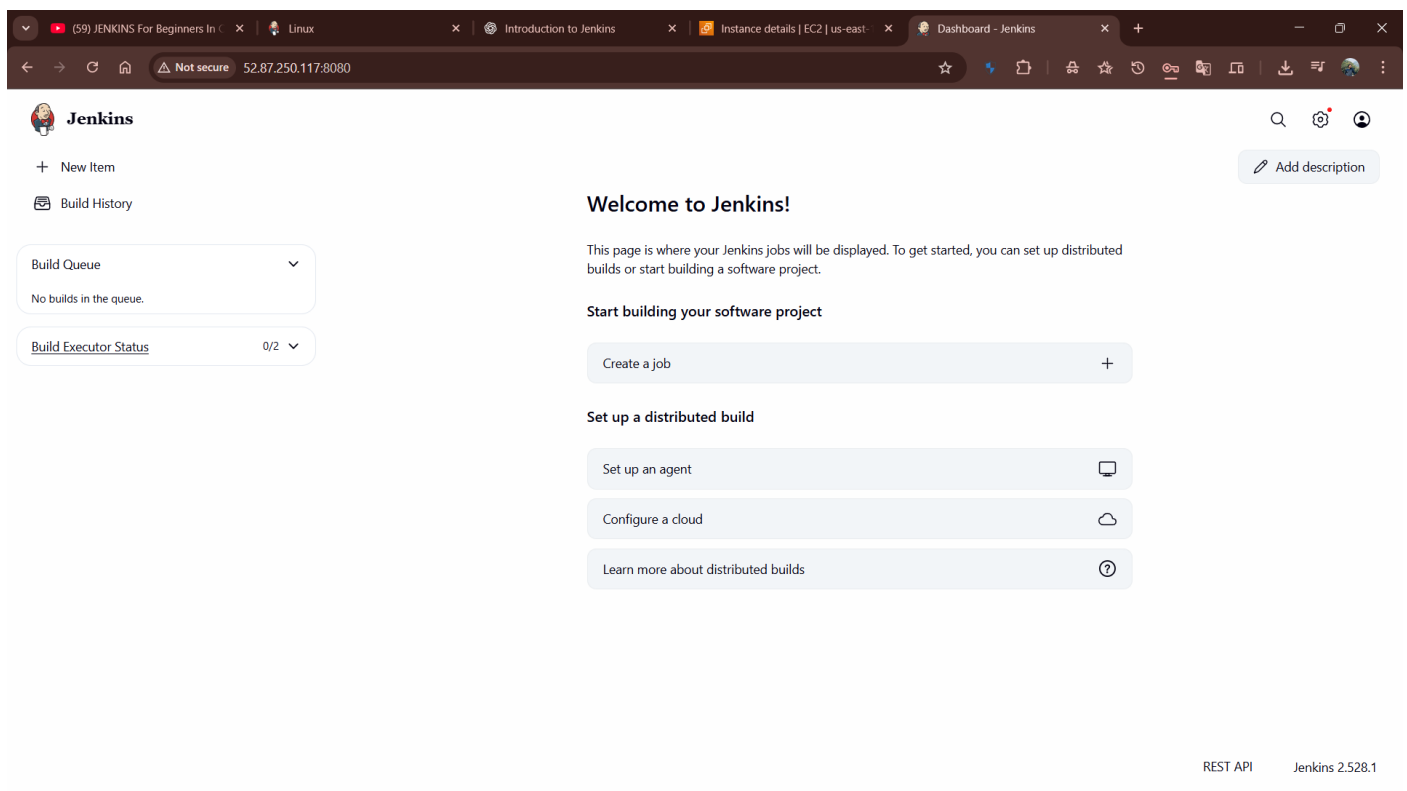
Copy the password shown in the terminal and paste it into the Jenkins setup page.

9. Install Suggested Plugins

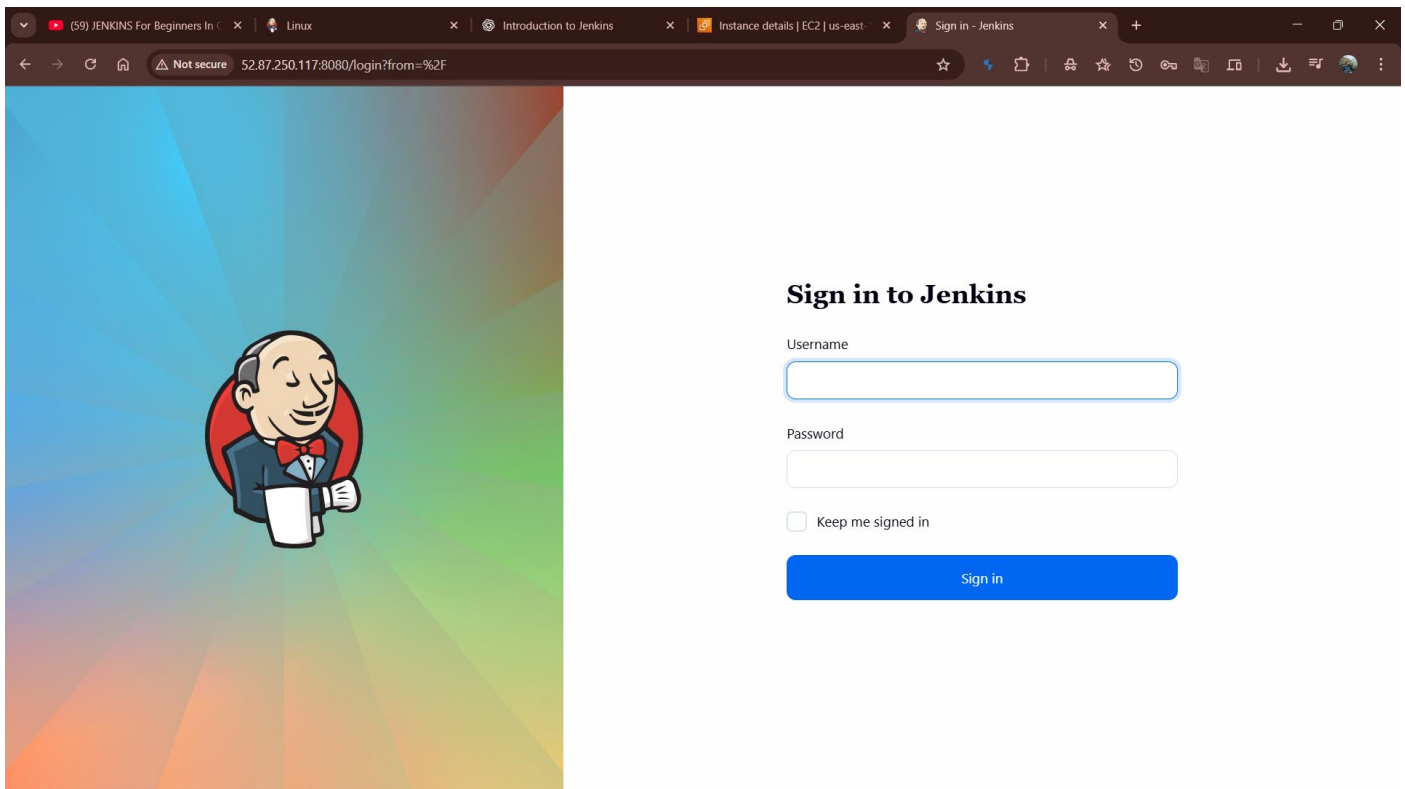
After logging in, Jenkins will ask to:

- Install suggested plugins (recommended)
- Create an admin user
- Set up instance configuration

Follow the on-screen steps to complete setup.



The screenshot shows the Jenkins Dashboard in a web browser. The browser's address bar displays '52.87.250.117:8080'. The Jenkins logo is in the top left, with links for 'New Item' and 'Build History'. The main content area is titled 'Welcome to Jenkins!' and includes a description: 'This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.' Below this, there are three sections: 'Start building your software project' with a 'Create a job' button; 'Set up a distributed build' with buttons for 'Set up an agent', 'Configure a cloud', and 'Learn more about distributed builds'; and a 'Build Queue' section showing 'No builds in the queue.' and a 'Build Executor Status' section showing '0/2'. The bottom right corner of the dashboard displays 'REST API' and 'Jenkins 2.528.1'.



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

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