

## Lesson 05 Demo 01

### Setting Up Jenkins

**Objective:** To automate continuous integration, enable seamless code integration, and automate testing for accelerating software development and deployment processes

**Tools required:** JRE and Jenkins

**Prerequisites:** None

Steps to be followed:

1. Download the Java Runtime Environment
2. Download and install the Jenkins app

#### Step 1: Download the Java Runtime Environment

1.1 Open the terminal and run **sudo apt-get update** command to update the package lists

```
labsuser@ip-172-31-39-225:~$ sudo apt-get update
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.28/deb InRelease
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Reading package lists... Done
```

1.2 Run **sudo apt install default-jdk** command to install JDK

```
labsuser@ip-172-31-39-225:~$ sudo apt install default-jdk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ca-certificates-java default-jdk-headless default-jre default-jre-headless fonts-dejavu-extra java-common libatk-wrapper-java libatk-wrapper-java-jni libice-dev
  libpthread-stubs0-dev libsm-dev libx11-dev libxau-dev libxcb1-dev libxdmcp-dev libxt-dev openjdk-11-jdk openjdk-11-jdk-headless openjdk-11-jre
  openjdk-11-jre-headless x11proto-dev xorg-sgml-doctools xtrans-dev
Suggested packages:
  libice-doc libsm-doc libx11-doc libxcb-doc libxt-doc openjdk-11-demo openjdk-11-source visualvm fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei
  | fonts-wqy-zenhei
The following NEW packages will be installed:
```

- 1.3 Run the **java -version** command to verify the installation; it will print the JDK version as shown below:

```
labsuser@ip-172-31-39-225:~$ java -version
openjdk version "11.0.21" 2023-10-17
OpenJDK Runtime Environment (build 11.0.21+9-post-Ubuntu-0ubuntu122.04)
OpenJDK 64-Bit Server VM (build 11.0.21+9-post-Ubuntu-0ubuntu122.04, mixed mode, sharing)
labsuser@ip-172-31-39-225:~$
```

## Step 2: Download and install the Jenkins app

- 2.1 Open the terminal and execute the following command:  
**sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key**

```
labsuser@ip-172-31-39-225:~$ sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
--2024-01-25 06:40:00-- https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
Resolving pkg.jenkins.io (pkg.jenkins.io)... 151.101.22.133, 2a04:4e42:7a::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)|151.101.22.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3175 (3.1K) [application/pgp-keys]
Saving to: '/usr/share/keyrings/jenkins-keyring.asc'

/usr/share/keyrings/jenkins-keyring.asc 100%[=====] 3.10K --.-KB/s in 0s

2024-01-25 06:40:00 (33.6 MB/s) - '/usr/share/keyrings/jenkins-keyring.asc' saved [3175/3175]

labsuser@ip-172-31-39-225:~$
```

- 2.2 Execute the following command to add the Jenkins repository to the system list:  
**echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]  
\https://pkg.jenkins.io/debian-stable binary/ | sudo tee  
/etc/apt/sources.list.d/jenkins.list > /dev/null**

```
labsuser@ip-172-31-39-225:~$ echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] https://pkg.jenkins.io/debian-stable binary/ | sudo tee /etc/apt/sources.list.d/jenkins.list > /dev/null
labsuser@ip-172-31-39-225:~$
```

### 2.3 Run **sudo apt-get update** command to update the local package index on a Debian-based system

```
labsuser@ip-172-31-39-225:~$ sudo apt-get update
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.28/deb InRelease
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Reading package lists... Done
```

### 2.4 Run **sudo apt-get install jenkins** command to install Jenkins

```
labsuser@ip-172-31-39-225:~$ sudo apt-get install jenkins
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
jenkins is already the newest version (2.426.2).
0 upgraded, 0 newly installed, 0 to remove and 69 not upgraded.
labsuser@ip-172-31-39-225:~$
```

### 2.5 Run the **sudo service jenkins status** command to check the status of the installation. Once you verify the status as active, press the **Ctrl+z** keys to exit the process.

```
labsuser@ip-172-31-39-225:~$ sudo service jenkins status
• jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-01-24 10:41:52 UTC; 48min ago
     Main PID: 57495 (java)
       Tasks: 46 (limit: 4598)
      Memory: 1.3G
         CPU: 2min 24.329s
    CGroup: /system.slice/jenkins.service
            └─57495 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.077+0000 [id=256] INFO jenkins.InitReactorRunner$1#onAttained: Listed all plugins
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.077+0000 [id=256] INFO jenkins.InitReactorRunner$1#onAttained: Prepared all plugins
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.230+0000 [id=258] INFO jenkins.InitReactorRunner$1#onAttained: Started all plugins
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.237+0000 [id=255] INFO jenkins.InitReactorRunner$1#onAttained: Augmented all extensions
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.309+0000 [id=258] INFO jenkins.InitReactorRunner$1#onAttained: System config loaded
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.312+0000 [id=258] INFO jenkins.InitReactorRunner$1#onAttained: System config adapted
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.373+0000 [id=256] INFO jenkins.InitReactorRunner$1#onAttained: Loaded all jobs
Jan 24 11:16:33 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:33.379+0000 [id=256] INFO jenkins.InitReactorRunner$1#onAttained: Configuration for all jobs updated
Jan 24 11:16:34 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:34.388+0000 [id=258] INFO jenkins.InitReactorRunner$1#onAttained: Completed initialization
Jan 24 11:16:34 ip-172-31-39-225 jenkins[57495]: 2024-01-24 11:16:34.394+0000 [id=277] INFO h.m.UpdateCenter$CompleteBatchJob#run: Completed installation of 84 plugins in 1s
lines 1-20/20 (END)
```

2.6 Run the following commands to start Jenkins:

**sudo systemctl start jenkins**  
**sudo systemctl status jenkins**

```
labuser@ip-172-31-39-225:~$ sudo systemctl start jenkins
labuser@ip-172-31-39-225:~$ sudo systemctl status jenkins
• jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-01-24 10:41:52 UTC; 13min ago
     Main PID: 57495 (java)
       Tasks: 44 (limit: 4598)
      Memory: 1.1G
         CPU: 1min 17.433s
    CGroup: /system.slice/jenkins.service
            └─57495 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Jan 24 10:41:19 ip-172-31-39-225 jenkins[57495]: 4251004b48e74a9387bafb05db3e0c06
Jan 24 10:41:19 ip-172-31-39-225 jenkins[57495]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Jan 24 10:41:19 ip-172-31-39-225 jenkins[57495]: *****
Jan 24 10:41:19 ip-172-31-39-225 jenkins[57495]: *****
Jan 24 10:41:19 ip-172-31-39-225 jenkins[57495]: *****
Jan 24 10:41:52 ip-172-31-39-225 jenkins[57495]: 2024-01-24 10:41:52.407+0000 [id=32] INFO jenkins.InitReactorRunner$1#onAttained: Completed initialization
Jan 24 10:41:52 ip-172-31-39-225 jenkins[57495]: 2024-01-24 10:41:52.453+0000 [id=22] INFO hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
Jan 24 10:41:52 ip-172-31-39-225 systemd[1]: Started Jenkins Continuous Integration Server.
Jan 24 10:41:52 ip-172-31-39-225 jenkins[57495]: 2024-01-24 10:41:52.873+0000 [id=47] INFO h.m.DownloadService$Downloadable#load: Obtained the updated data f
Jan 24 10:41:52 ip-172-31-39-225 jenkins[57495]: 2024-01-24 10:41:52.874+0000 [id=47] INFO hudson.util.Retrier#start: Performed the action check updates serv
lines 1-20/20 (END)
```

2.7 Click on the **master** button

CS Lab 1

Vocareum Test Lab 2

Vocareum Test Lab 3

Vocareum test Lab 4

Kubernetes Lab\_v1.28

Advanced Gen A

master

worker1

worker2

Used 6 of 50 hours in Jan, 2024

03:47

Start Lab

End Lab

Details

Reset

Master Status: Ready

W: Target CNF (main/cnf/Commands-all) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target Packages (main/binary-amd64/Packages) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target Packages (main/binary-all/Packages) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target Translations (main/i18n/Translation-en) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target DEP-11 (main/dep11/Components-amd64.yml) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target DEP-11 (main/dep11/Components-all.yml) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target DEP-11-icons-small (main/dep11/icons-48x48.tar) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target DEP-11-icons (main/dep11/icons-64x64.tar) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target DEP-11-icons-hidpi (main/dep11/icons-64x64@2.tar) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target CNF (main/cnf/Commands-amd64) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

W: Target CNF (main/cnf/Commands-all) is configured multiple times in /etc/apt/sources.list.d/google-chrome.list:3 and /etc/apt/sources.list.d/google-chrome.list:4

Reading package lists... Done

Building dependency tree... Done

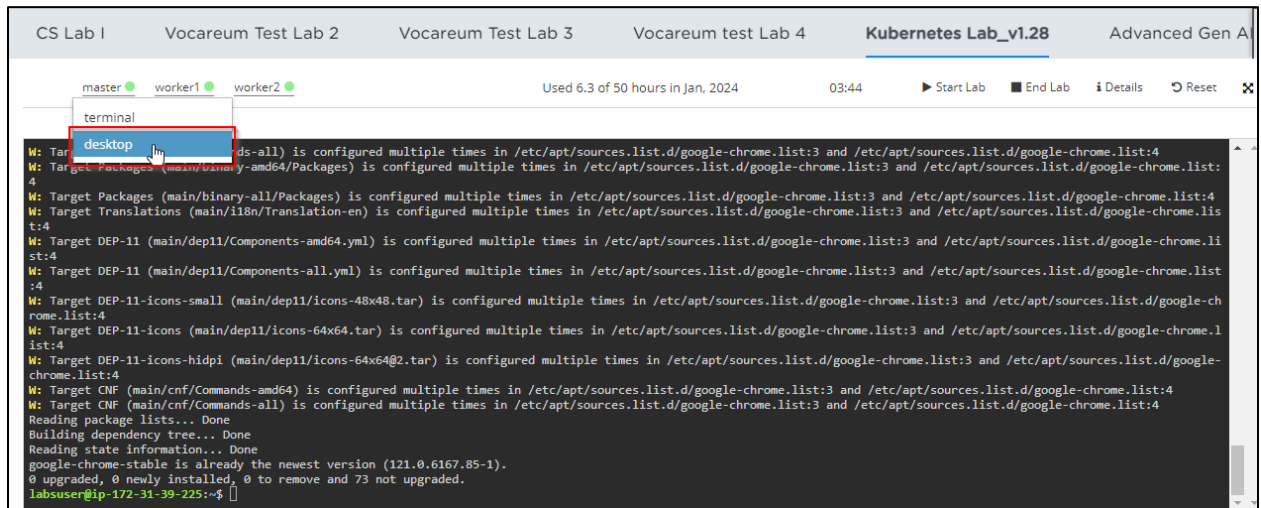
Reading state information... Done

google-chrome-stable is already the newest version (121.0.6167.85-1).

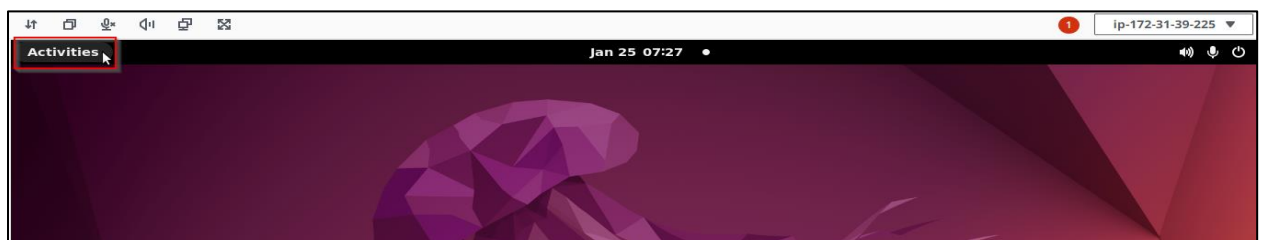
0 upgraded, 0 newly installed, 0 to remove and 73 not upgraded.

labuser@ip-172-31-39-225:~\$

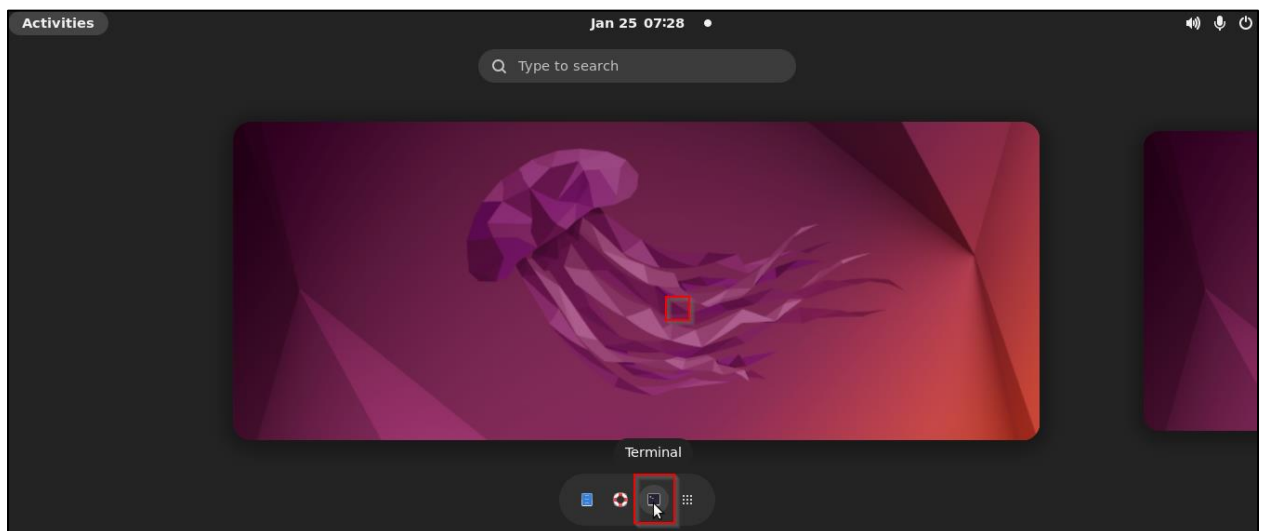
2.8 Click on the **desktop** option as shown in the below screenshot:



2.9 Click on the **Activities** button



2.10 Click on the icon at the bottom to open the terminal as shown in the screenshot below:





2.11 Run the following commands to install Chrome:

#Download the Google Chrome signing key

```
wget -q -O - https://dl-ssl.google.com/linux/linux_signing_key.pub | sudo apt-key add -
```

#Add the Google Chrome repository to your sources list

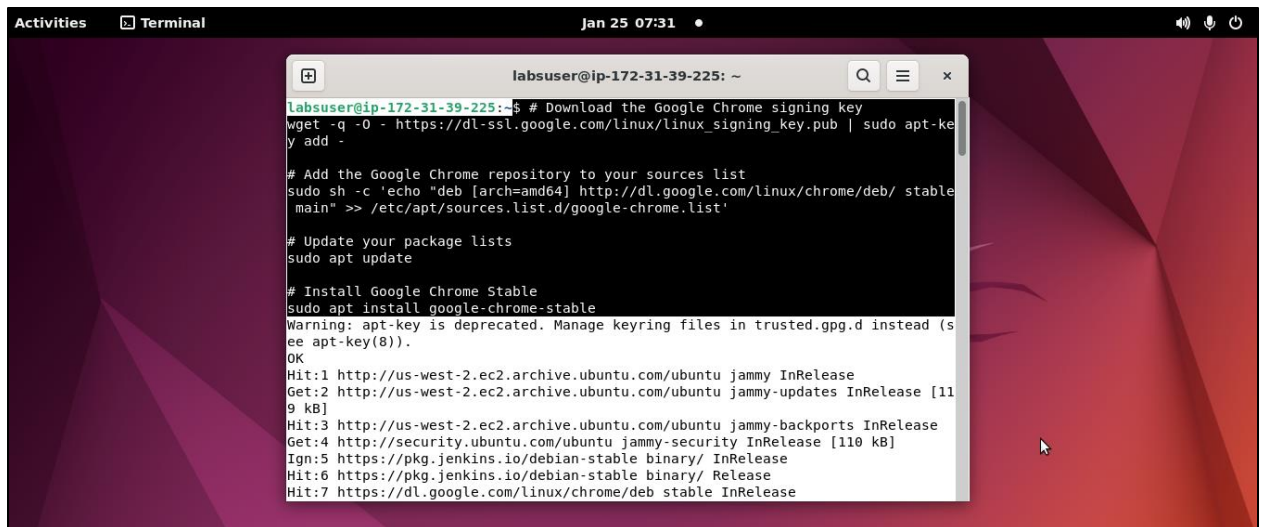
```
sudo sh -c 'echo "deb [arch=amd64] http://dl.google.com/linux/chrome/deb/ stable main" >> /etc/apt/sources.list.d/google-chrome.list'
```

#Update your package lists

```
sudo apt update
```

#Install Google Chrome stable

```
sudo apt install google-chrome-stable
```

A terminal window titled 'labuser@ip-172-31-39-225: ~' showing the execution of commands to install Google Chrome. The commands are: 'wget -q -O - https://dl-ssl.google.com/linux/linux\_signing\_key.pub | sudo apt-key add -', 'sudo sh -c \'echo "deb [arch=amd64] http://dl.google.com/linux/chrome/deb/ stable main" >> /etc/apt/sources.list.d/google-chrome.list\'', 'sudo apt update', and 'sudo apt install google-chrome-stable'. The output shows a warning about apt-key being deprecated, followed by a list of repository updates from Ubuntu and Jenkins, and finally the installation of Google Chrome stable from the Google repository.

```
labuser@ip-172-31-39-225:~$ # Download the Google Chrome signing key
wget -q -O - https://dl-ssl.google.com/linux/linux_signing_key.pub | sudo apt-key add -

# Add the Google Chrome repository to your sources list
sudo sh -c 'echo "deb [arch=amd64] http://dl.google.com/linux/chrome/deb/ stable main" >> /etc/apt/sources.list.d/google-chrome.list'

# Update your package lists
sudo apt update

# Install Google Chrome Stable
sudo apt install google-chrome-stable
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Ign:5 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:6 https://pkg.jenkins.io/debian-stable binary/ Release
Hit:7 https://dl.google.com/linux/chrome/deb stable InRelease
```

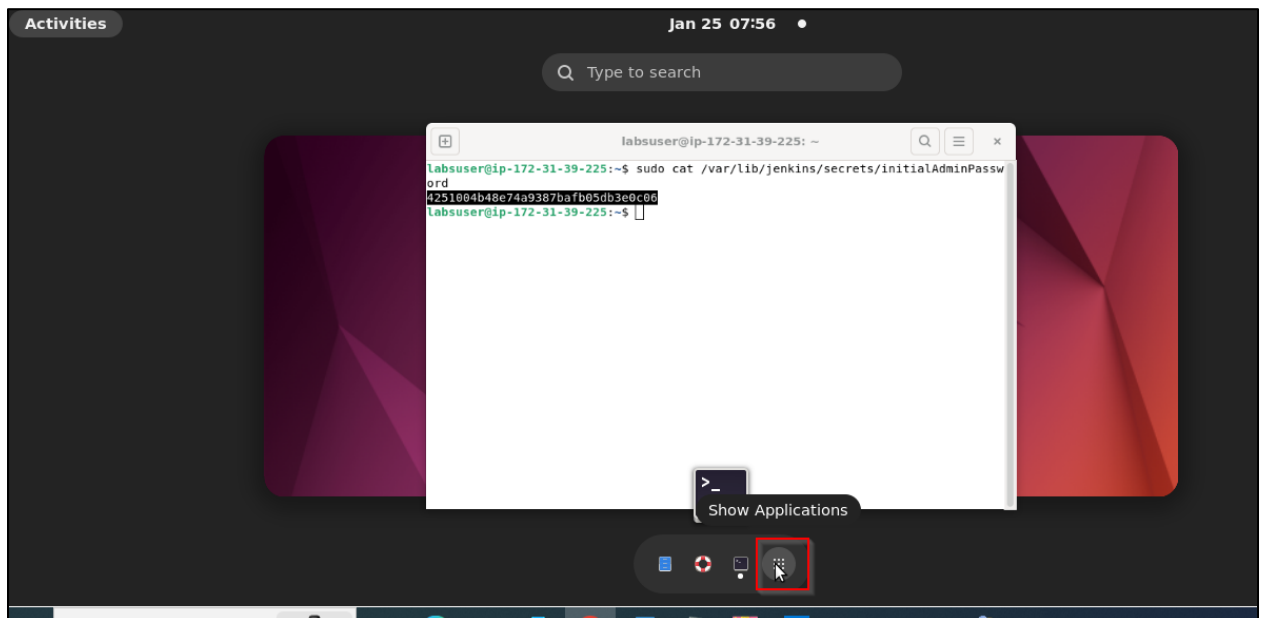
2.12 Run the following command to get the password:

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

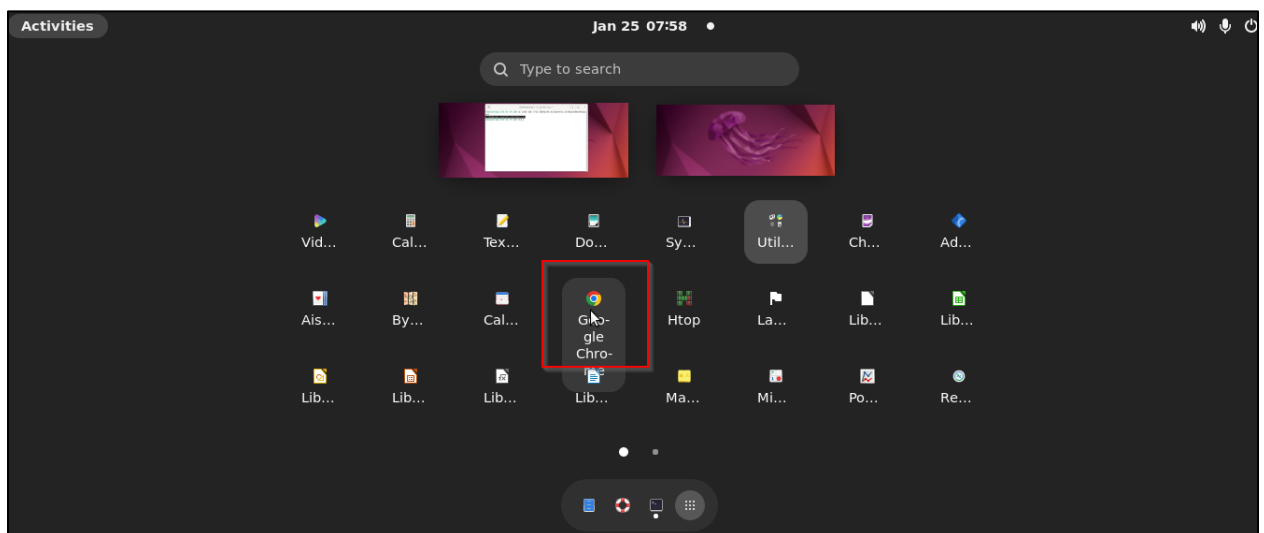
A terminal window titled 'labuser@ip-172-31-39-225: ~' showing the command 'sudo cat /var/lib/jenkins/secrets/initialAdminPassword' being executed. The output is a long alphanumeric string, which is highlighted with a red box.

```
labuser@ip-172-31-39-225:~$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
4251004b48e74a9387bafb05db3e0c06
labuser@ip-172-31-39-225:~$
```

2.13 Click on the below icon as shown in the screenshot below:



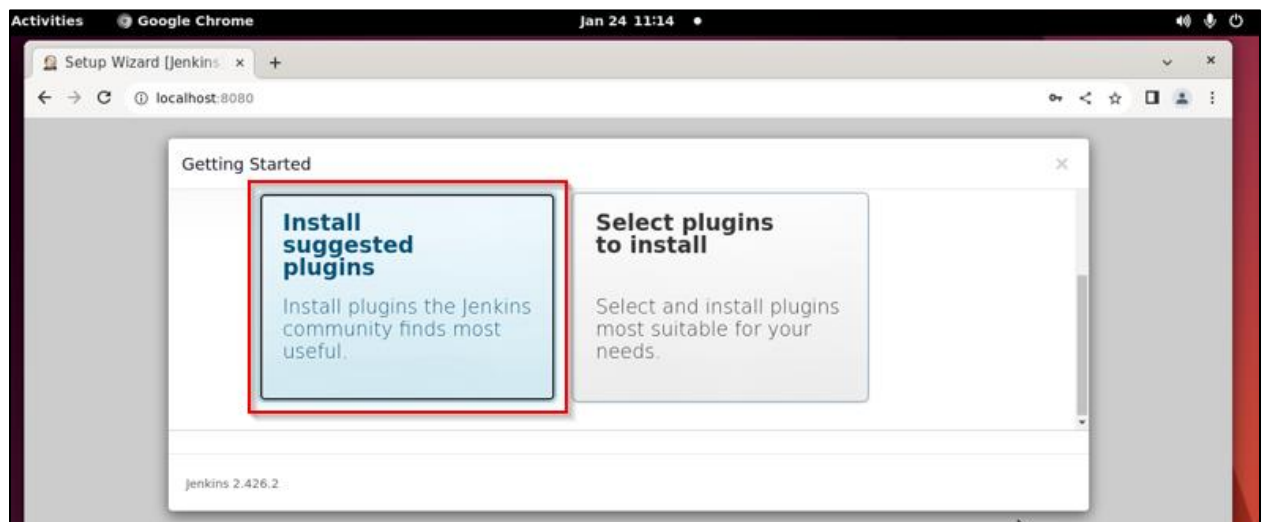
2.14 Click on the **Google Chrome** icon as shown in the below screenshot:



2.15 Open **localhost:8080** in the browser, enter the initial password, and then click on **Continue**

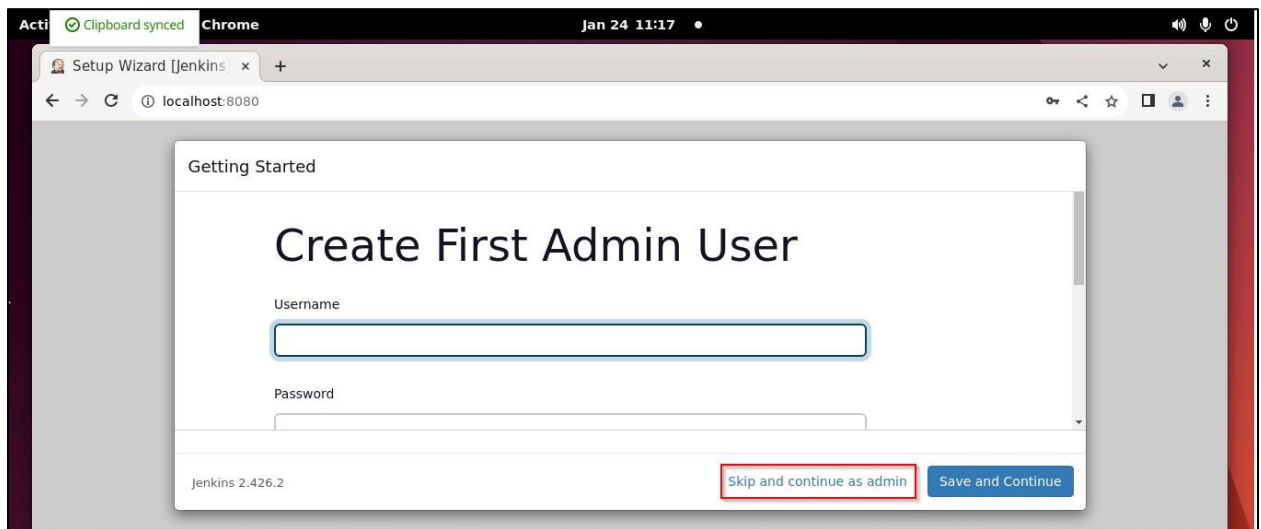


2.16 Click on **Install suggested plugins** option

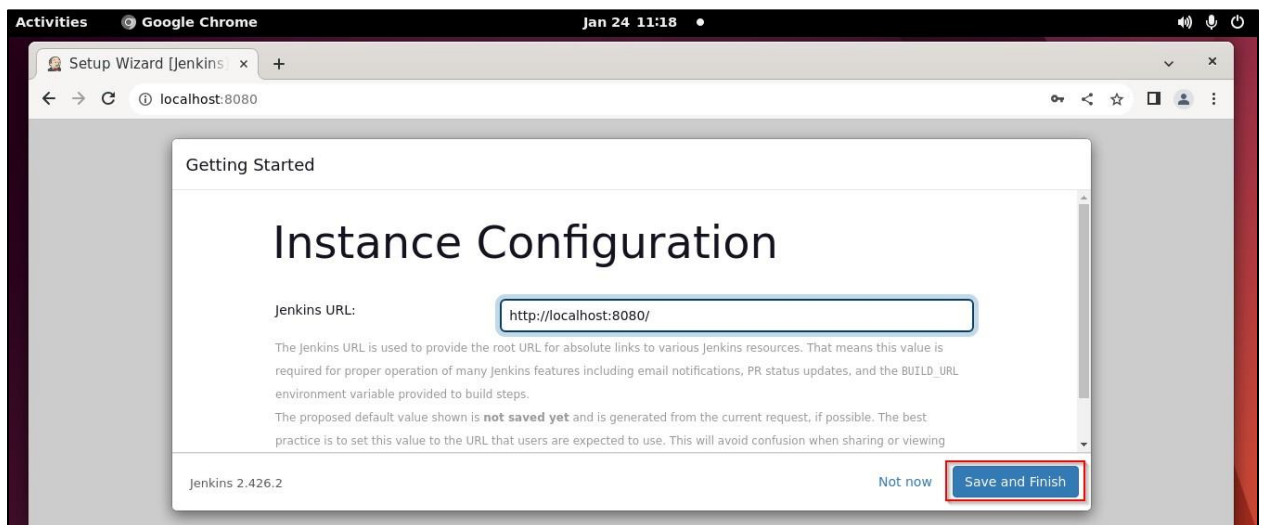




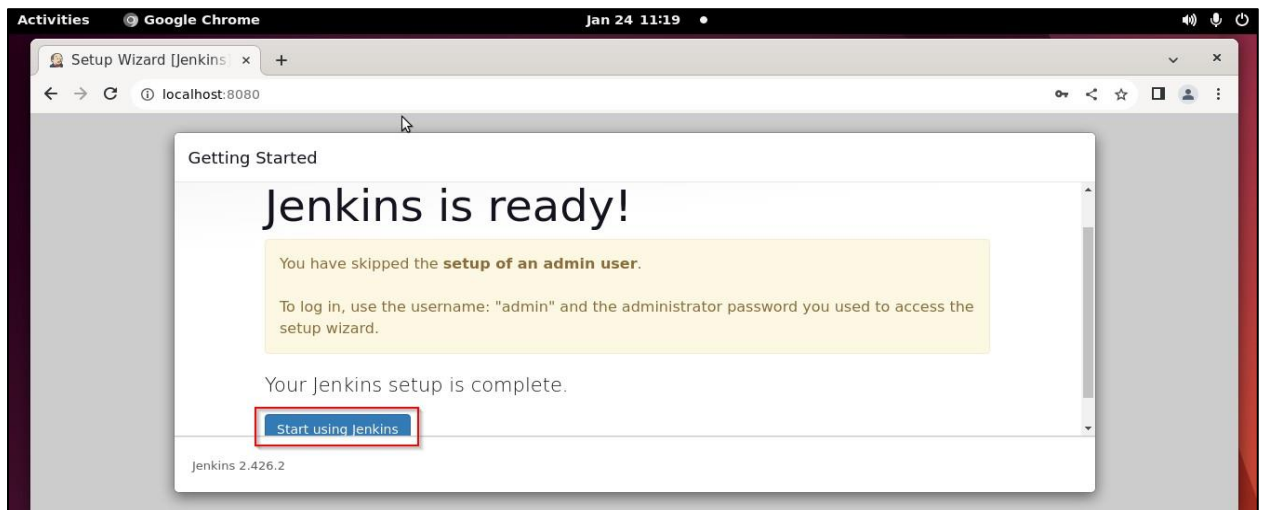
## 2.17 Click on the **Skip and continue as admin** button



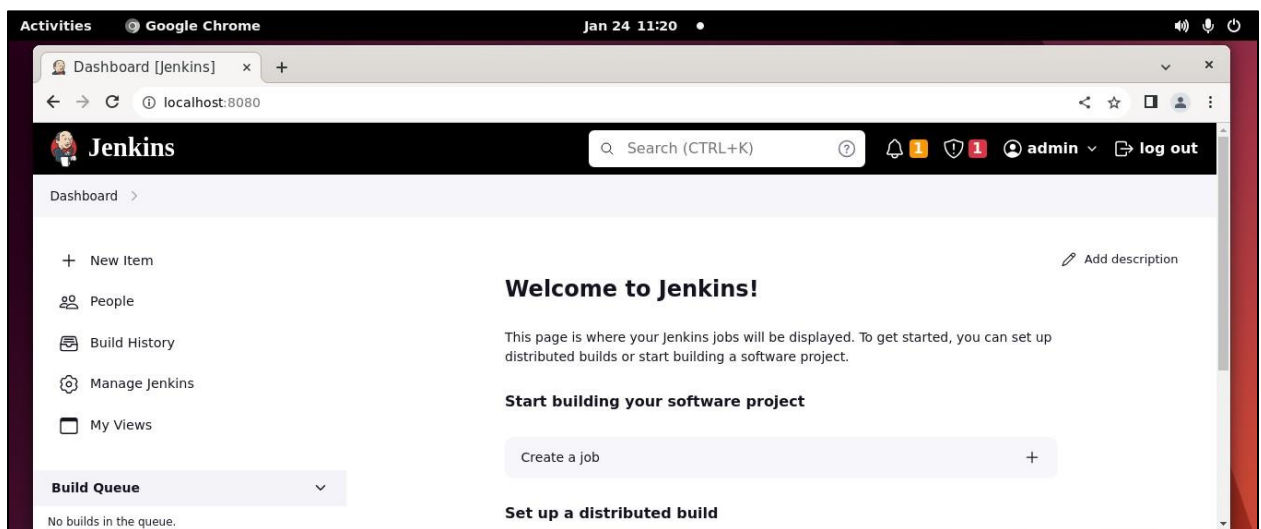
## 2.18 Click on **Save and Finish** button



## 2.19 Click on **Start using Jenkins** button



Now, you may work with Jenkins as shown in the screenshot below:



By following these steps, you have successfully installed Jenkins for accelerating software development and deployment processes.