

Nnadiyekwe, Chiderah David

Project- Installing and setting up Jenkins on Ubuntu

- **Installing Jenkins on Ubuntu EC2 instance**

Reference the official Jenkins installation documentation;

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

Note: 1. You Jenkins is written with Java. Hence, you need to have JDK (Java development kit) installed in your computer to be able to install and run Jenkins on the Ubuntu. Based on the documentation, we need to install OpenJDK17.

2. Note that Jenkins by default operates using port 8080. Hence, you'll need to have port 8080 opened in the security group of the instance.

Installation of Java

Jenkins requires Java to run, yet not all Linux distributions include Java by default. Additionally, [not all Java versions are compatible](#) with Jenkins.

There are multiple Java implementations which you can use. [OpenJDK](#) is the most popular one at the moment, we will use it in this guide.

Update the Debian apt repositories, install OpenJDK 17, and check the installation with the commands:

```
sudo apt update
sudo apt install fontconfig openjdk-17-jre
java -version
openjdk version "17.0.8" 2023-07-18
OpenJDK Runtime Environment (build 17.0.8+7-Debian-1deb12u1)
OpenJDK 64-Bit Server VM (build 17.0.8+7-Debian-1deb12u1, mixed mode, sharing)
```

Result:

```
ubuntu@ip-10-0-3-232:~$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1200 kB]
Fetched 1319 kB in 1s (1357 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
4 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-10-0-3-232:~$ sudo apt install fontconfig openjdk-17-jre
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service fontconfig-config fonts-dejavu-core fonts-dejavu-extra
  gsettings-desktop-schemas gtk-update-icon-cache hicolor-icon-theme humanity-icon-theme java-common libasound2 libasound2-data libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni
  libatk1.0-0 libatk1.0-data libatspi2.0-0 libavahi-client3 libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcups2 libdatrie1 libfontconfig1 libfontconfig1 libdrm-amdgpu1 libdrm-intel1
  libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgail-common libgail18 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-amd-glx libgl1-mesa-dri
  libglapi-mesa libglvnd0 libglx-mesa0 libglx0 libgraphite2-3 libgtk2.0-0 libgtk2.0-bin libgtk2.0-common libharfbuzz0b libice6 libjpeg-turbo8 libjpeg8 liblcms2-2 liblvm2 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpcaaccess0 libpcsc-lite1 libpixmap-1-0 librsvg-2 librsvg2-common librsensors-config librsensors5 libsm6 libthai-data libthai0 libtiff5 libwebp7 libx11-xcb1
  libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcomposite1 libxcursor1 libxdamage1 libxfixes3
  libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrandr2 libxrender1 libxshmfence1 libxt6 libxtst6 libxv1 libxxf86dga1 libxxf86vm1 openjdk-17-jre-headless session-migration ubuntu-mono
  x11-common x11-utils
Suggested packages:
  default-jre libasound2-plugins alsa-utils cups-common gvfs liblcms2-utils pcsd librsvg2-bin lm-sensors libnss-mdns fonts-ipafont-gothic fonts-ipafont-mincho fonts-way-microhei | fonts-way-zenhei
  fonts-indic mesa-utils
The following NEW packages will be installed:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service fontconfig fontconfig-config fonts-dejavu-core fonts-dejavu-extra
  gsettings-desktop-schemas gtk-update-icon-cache hicolor-icon-theme humanity-icon-theme java-common libasound2 libasound2-data libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni
  libatk1.0-0 libatk1.0-data libatspi2.0-0 libavahi-client3 libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcups2 libdatrie1 libfontconfig1 libfontconfig1 libdrm-amdgpu1 libdrm-intel1
  libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgail-common libgail18 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-amd-glx libgl1-mesa-dri
  libglapi-mesa libglvnd0 libglx-mesa0 libglx0 libgraphite2-3 libgtk2.0-0 libgtk2.0-bin libgtk2.0-common libharfbuzz0b libice6 libjpeg-turbo8 libjpeg8 liblcms2-2 liblvm2 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpcaaccess0 libpcsc-lite1 libpixmap-1-0 librsvg-2 librsvg2-common librsensors-config librsensors5 libsm6 libthai-data libthai0 libtiff5 libwebp7 libx11-xcb1
  libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcomposite1 libxcursor1 libxdamage1 libxfixes3
  libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrandr2 libxrender1 libxshmfence1 libxt6 libxtst6 libxv1 libxxf86dga1 libxxf86vm1 openjdk-17-jre openjdk-17-jre-headless session-migration
  ubuntu-mono x11-common x11-utils
0 upgraded, 114 newly installed, 0 to remove and 4 not upgraded.
Need to get 486 MB of archives.
After this operation, 448 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 hicolor-icon-theme all 0.17-2 [9976 B]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgdk-pixbuf2.0-common all 2.42.8+dfsg-1ubuntu0.2 [5530 B]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libjpeg-turbo8 amd64 2.1.2-0ubuntu1 [134 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libjpeg8 amd64 8c-2ubuntu10 [2264 B]
done.
Processing triggers for libgl1.0-0:amd64 (2.72.4-0ubuntu2.2) ...
Processing triggers for libc-bin (2.35-0ubuntu3.4) ...
Setting up at-spi2-core (2.44.0-3) ...
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.8+dfsg-1ubuntu0.2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
systemctl restart chrony.service cron.service packagekit.service polkit.service serial-getty@ttyS0.service snap.amazon-ssm-agent.amazon-ssm-agent.service snapd.service ssh.service
Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-10-0-3-232:~$ java -version
openjdk version "17.0.8.1" 2023-08-24
OpenJDK Runtime Environment (build 17.0.8.1-1-Ubuntu-0ubuntu122.04)
```

Now, to install jenkins on the ubuntu server, we use the instruction;

Debian/Ubuntu

On Debian and Debian-based distributions like Ubuntu you can install Jenkins through [apt](#).



With the release of [Debian 12](#), OpenJDK 11 is **no longer** included. It has been replaced with [OpenJDK 17](#), which is reflected in the instructions below.

Long Term Support release

A [LTS \(Long-Term Support\)](#) release is chosen every 12 weeks from the stream of regular releases as the stable release for that time period. It can be installed from the [debian-stable apt repository](#).

```
sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \
https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
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
sudo apt-get update
sudo apt-get install jenkins
```

Result:

```
ubuntu@ip-10-0-3-232:~$ sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \
https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
2023-11-27 16:24:26 -- https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
Resolving pkg.jenkins.io (pkg.jenkins.io)... 146.75.34.133, 2a84:4e42:78::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)[146.75.34.133]: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

2023-11-27 16:24:26 (34.7 MB/s) - '/usr/share/keyrings/jenkins-keyring.asc' saved [3175/3175]

ubuntu@ip-10-0-3-232:~$ 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
ubuntu@ip-10-0-3-232:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Ign:5 https://pkg.jenkins.io/debian-stable binary/ InRelease
Get:6 https://pkg.jenkins.io/debian-stable binary/ Release [2844 B]
Get:7 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Get:8 https://pkg.jenkins.io/debian-stable binary/ Packages [25.9 kB]
Fetched 28.8 kB in 1s (33.6 kB/s)
Reading package lists... Done
ubuntu@ip-10-0-3-232:~$ sudo apt-get install jenkins
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  net-tools
The following NEW packages will be installed:
  jenkins net-tools
0 upgraded, 2 newly installed, 0 to remove and 4 not upgraded.
Need to get 89.2 MB of archives.
After this operation, 90.4 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

```
ubuntu@ip-10-0-3-232:~$ sudo apt-get install jenkins
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  net-tools
The following NEW packages will be installed:
  jenkins net-tools
0 upgraded, 2 newly installed, 0 to remove and 4 not upgraded.
Need to get 89.2 MB of archives.
After this operation, 90.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 net-tools amd64 1.60+git20181103.0eebece-1ubuntu5 [204 kB]
Get:2 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.426.1 [89.0 MB]
Fetched 89.2 MB in 22s (3991 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 80353 files and directories currently installed.)
Preparing to unpack .../net-tools 1.60+git20181103.0eebece-1ubuntu5_amd64.deb ...
Unpacking net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Selecting previously unselected package jenkins.
Preparing to unpack .../jenkins 2.426.1_all.deb ...
Unpacking jenkins (2.426.1) ...
Setting up net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Setting up jenkins (2.426.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service -- /lib/systemd/system/jenkins.service.
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
systemctl restart snap.amazon-ssm-agent.amazon-ssm-agent.service
Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

No user sessions are running outdated binaries.
```

Verifying the jenkins installation:

```
ubuntu@ip-10-0-3-232:~$ jenkins --version
2.426.1
ubuntu@ip-10-0-3-232:~$
```

Start Jenkins

You can enable the Jenkins service to start at boot with the command:

```
sudo systemctl enable jenkins
```

You can start the Jenkins service with the command:

```
sudo systemctl start jenkins
```

You can check the status of the Jenkins service using the command:

```
sudo systemctl status jenkins
```

If everything has been set up correctly, you should see an output like this:

```
Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
Active: active (running) since Tue 2018-11-13 16:19:01 +03; 4min 57s ago
```

Result:

```
ubuntu@ip-10-0-3-232:~$ sudo systemctl enable jenkins
Synchronizing state of jenkins.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable jenkins
ubuntu@ip-10-0-3-232:~$ sudo systemctl start jenkins
ubuntu@ip-10-0-3-232:~$ 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 Mon 2023-11-27 16:20:50 UTC; 25min ago
     Main PID: 13532 (java)
       Tasks: 41 (Limit: 1121)
      Memory: 286.4M
         CPU: 44.415s
    CGroup: /system.slice/jenkins.service
            └─13532 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Nov 27 16:26:20 ip-10-0-3-232 jenkins[13532]: 2f0c16f58a7246eca610b8315ccb4e40
Nov 27 16:26:20 ip-10-0-3-232 jenkins[13532]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Nov 27 16:26:20 ip-10-0-3-232 jenkins[13532]: *****
Nov 27 16:26:20 ip-10-0-3-232 jenkins[13532]: *****
Nov 27 16:26:20 ip-10-0-3-232 jenkins[13532]: *****
Nov 27 16:26:50 ip-10-0-3-232 jenkins[13532]: 2023-11-27 16:26:50.482+0000 [id=32] INFO Jenkins.InitReactorRunner$NonAttained: Completed initialization
Nov 27 16:26:50 ip-10-0-3-232 jenkins[13532]: 2023-11-27 16:26:50.477+0000 [id=24] INFO hudson.lifecycle.Lifecycle$onReady: Jenkins is fully up and running
Nov 27 16:26:50 ip-10-0-3-232 systemd[1]: Started Jenkins Continuous Integration Server.
Nov 27 16:26:50 ip-10-0-3-232 jenkins[13532]: 2023-11-27 16:26:50.696+0000 [id=47] INFO h.m.DownloadService$DownloadablesLoad: Obtained the updated data file for hudson.tasks.Maven.MavenI
Nov 27 16:26:50 ip-10-0-3-232 jenkins[13532]: 2023-11-27 16:26:50.698+0000 [id=47] INFO hudson.util.Retrier$start: Performed the action check updates server successfully at the attempt #1
lines 1-20/20 (END)
```

We can access the jenkins using the instance public Ip and putting :8080 behind the Ip to allow the ip use the port 8080

Instances (1/4) [Info](#)

Find Instance by attribute or tag (case-sensitive)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Ela
<input checked="" type="checkbox"/> ubuntu-server	i-057ae3af7b882cf3d	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-3-219-217-249.co...	3.219.217.249	-
<input type="checkbox"/> ec2-test	i-0422531812736561b	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-34-201-32-191.co...	34.201.32.191	-
<input type="checkbox"/> ubuntu-server	i-0fb06f64827fa0f1e	Terminated	t2.micro	-	No alarms	us-east-1a	-	-	-
<input type="checkbox"/> ubuntu-server	i-0d0d75a24e6070a7f	Terminated	t2.micro	-	No alarms	us-east-1b	-	-	-

Instance: i-057ae3af7b882cf3d (ubuntu-server)

[Details](#) [Security](#) [Networking](#) [Storage](#) [Status checks](#) [Monitoring](#) [Tags](#)

Instance summary [Info](#)

Instance ID
i-057ae3af7b882cf3d (ubuntu-server)

IPv6 address
-

Hostname type
IP name: ip-10-0-3-232.ec2.internal

Answer private resource DNS name
-

Auto-assigned IP address
3.219.217.249 [Public IP]

IAM Role
SSM-Full-Access

IMDSv2
Required

Public IPv4 address copied

3.219.217.249 [open address](#)

Instance state
Running

Private IP DNS name (IPv4 only)
ip-10-0-3-232.ec2.internal

Instance type
t2.micro

VPC ID
vpc-0984ea0ace2ba676e (CustomVPC-Hackathon-Team-2-vpc) [open address](#)

Subnet ID
subnet-0f3343ab6e12d6701 (CustomVPC-Hackathon-Team-2-subnet-public1-us-east-1a) [open address](#)

Private IPv4 addresses
10.0.3.232

Public IPv4 DNS
ec2-3-219-217-249.compute-1.amazonaws.com [open address](#)

Elastic IP addresses
-

AWS Compute Optimizer finding
[Opt-in to AWS Compute Optimizer for recommendations.](#) [Learn more](#)

Auto Scaling Group name
-

Instance details [Info](#)

← → ↻ ⚠ Not secure | 3.219.217.249:8080/login?from=%2F

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:

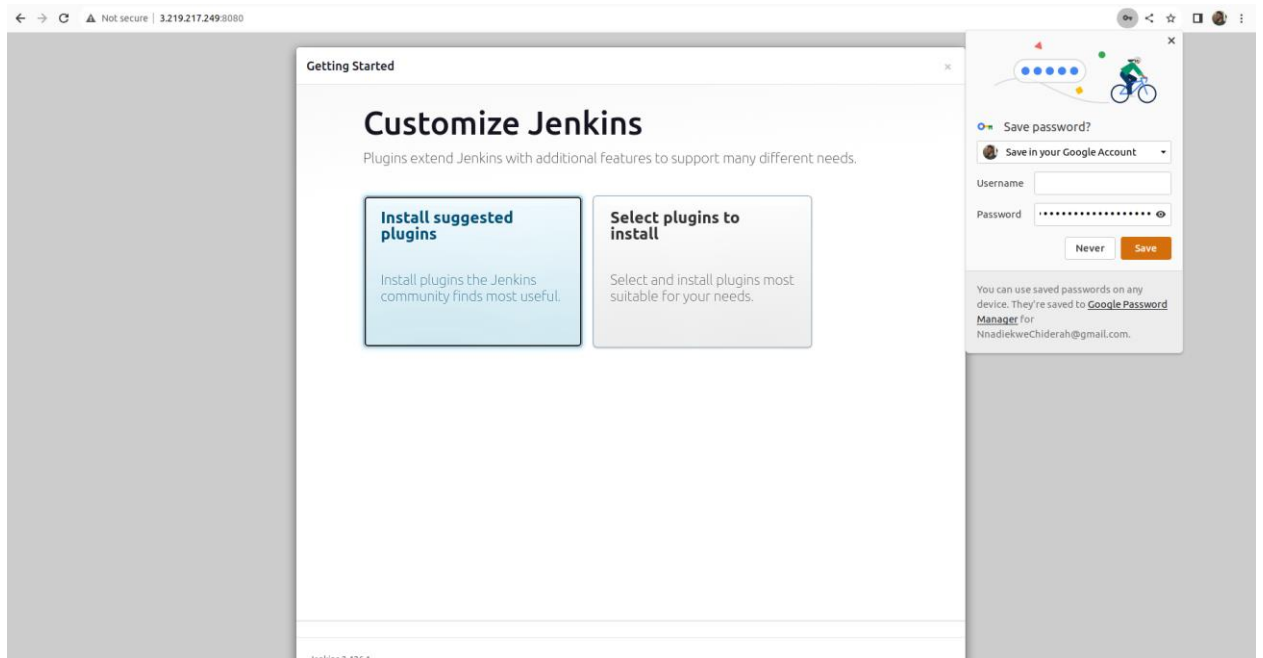
`/var/lib/jenkins/secrets/initialAdminPassword`

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

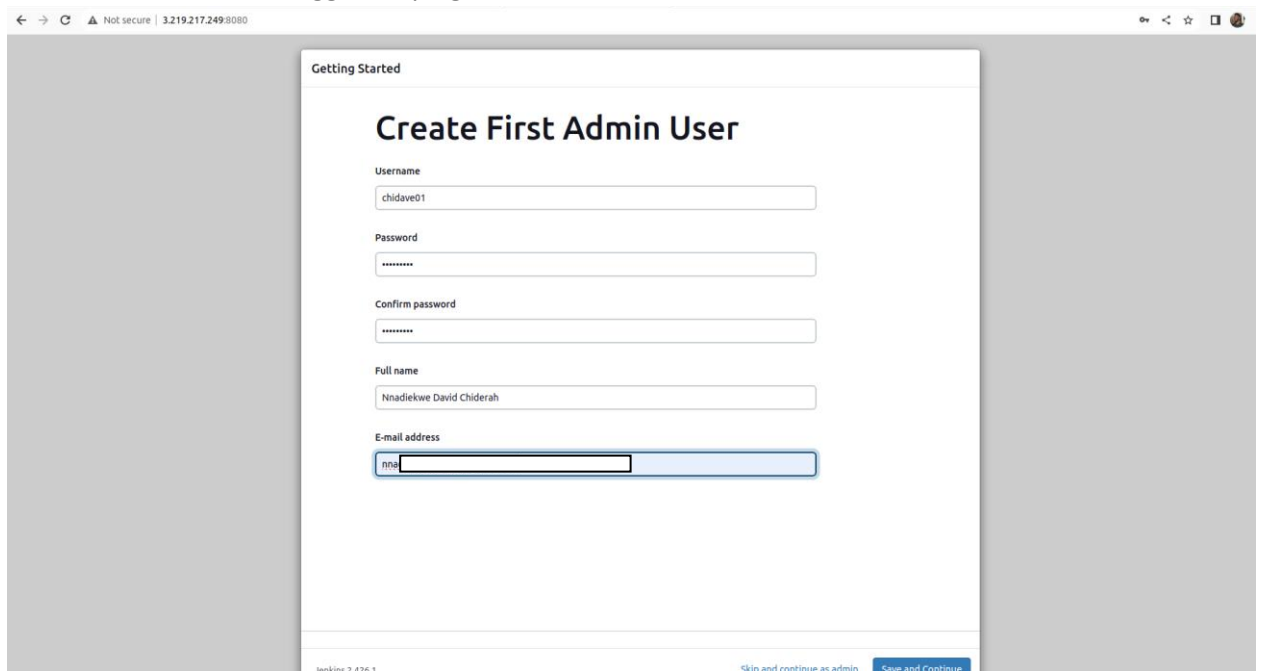
Administrator password

[Continue](#)

You can use the command; “`sudo cat /var/lib/jenkins/secrets/initialAdminPassword`” to show the password needed to login. Then Login! Next, you’ll see the screen below.



I selected to install the suggested plugins.



← → ↻ ⚠ Not secure | 3.219.217.249:8080

Getting Started

Instance Configuration

Jenkins URL:

http://3.219.217.249:8080/

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.

The proposed default value shown is **not saved yet** and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

jenkins ? 476.1

Not now [Save and Finish](#)

← → ↻ ⚠ Not secure | 3.219.217.249:8080

Jenkins

🔍 Search (CTRL+K)

🛡️ 🔴 👤 Nnadiakwe David Chiderah

🚪 log out

Dashboard >

+ New Item

👤 People

📅 Build History

⚙️ Manage Jenkins

📄 My Views

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

Welcome to Jenkins!

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.

Start building your software project

Create a job

Set up a distributed build

Set up an agent

Configure a cloud

Learn more about distributed builds

[Add description](#)

Jenkins has been installed and configured successfully!