

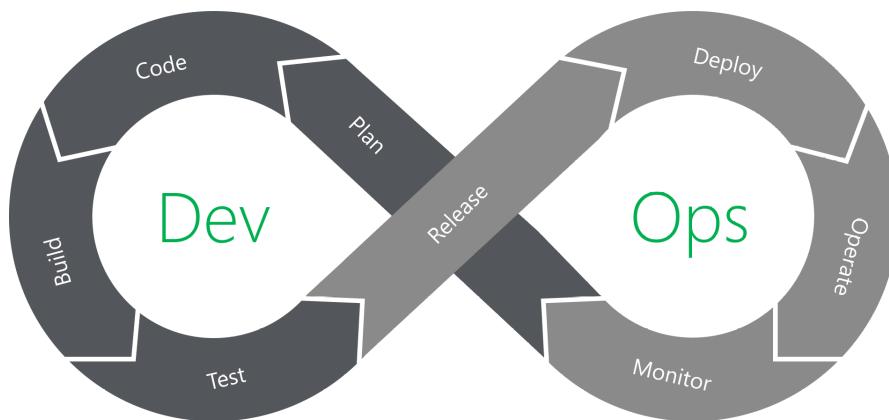
About Jenkins CI/CD pipelines:

(CI) Continuous Integration:

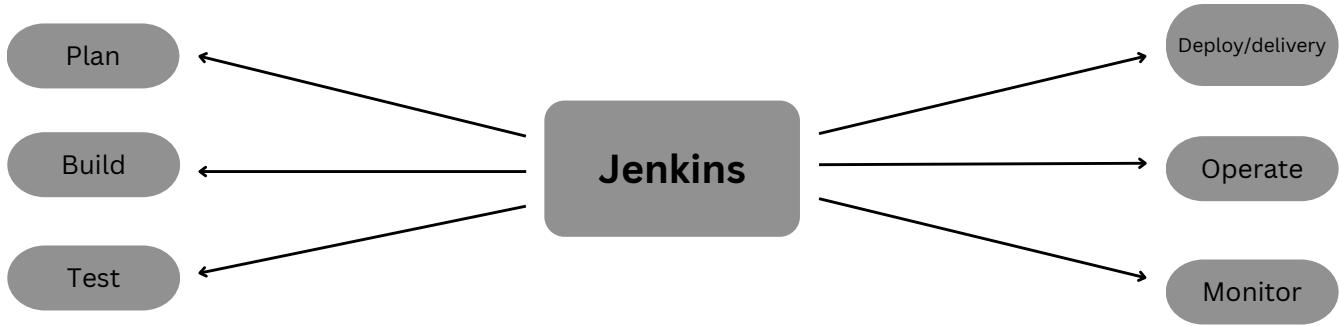
Continuously integration means developers regularly push their code changes to a shared repository on platforms like GitHub. CI servers monitor these repositories for changes. Upon detecting a change, The CI server automatically pulls the code from GitHub build, test and deploy the code. And the CI server will notify the developer if there are any errors in the code enabling them to address issues promptly. By this we can minimize time and errors.

Jenkins:

As soon as the developers push the code into github. When Jenkins detects a new change, it pulls the code from the repository. Jenkins then initiates the build process using tools like Maven. Maven is a build automation tool primarily used for Java projects After the build process completes, Jenkins triggers automated tests to ensure that the code functions as expected. This may include unit tests, integration tests, and other types of tests depending on the project's requirements. Once the code passes all tests successfully, Jenkins deploys the code to the designated environment. This could be a staging environment for further testing or directly to production. After deployment, it performs operational the tasks such as starting the application, configuring services. And then monitor using Nagios monitoring tool used to monitor the performance and availability of IT infrastructure components.



It automates the entire devoplmnt lifecycle by pulling the code and send for build, test, deploy, operate and monitor.



Steps to install Jenkins.

- Launch an EC2 instance
- update your machine
- Install java
- java --version
- Install Jenkins
- Jenkins --version
- systemctl enable jenkins
- systemctl start jenkins
- systemctl status jenkins

Screenshot of a Safari browser window showing the terminal output of an Ubuntu EC2 instance. The terminal is running an apt update command.

```

ubuntu@ip-172-31-15-128:~$ sudo apt update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1433 kB]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [280 kB]
Get:13 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [1523 kB]
Get:14 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [253 kB]
Get:15 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1053 kB]
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [237 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [22.1 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [42.1 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [10.1 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [472 B]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [41.7 kB]
Get:22 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [10.5 kB]
Get:23 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:24 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:25 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [24.3 kB]
Get:26 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [16.5 kB]
Get:27 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [644 B]
Get:28 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:29 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1208 kB]
Get:30 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [219 kB]
Get:31 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [1480 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [245 kB]
Get:33 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [847 kB]
Get:34 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [161 kB]
Get:35 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [16.8 kB]
  
```

i-0a64cd034cb32097b

PublicIPs: 3.7.252.135 PrivateIPs: 172.31.15.128

```
aws Services Search [Option+S] Mumbai poja.bhavani @ poojabhavani ▾
ubuntu@ip-172-31-9-149:~$ sudo apt install openjdk-11-jre
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
alsa-topology-conf alsu-ucm-conf at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service fontconfig-config fonts-dejavu-core
fonts-dejavu-extra gsettings-desktop-schemas 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 libavahi-common3 libcupsys2 libdconf1 libdrm-amdgpu libdrm-intel
libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgif7 libgl1 libgl1-amber-dri libgl1-mesa-dri libglapi-mesa libglvnd0 libglx-mesa0 libglx0
libgraphite2-3 libharfbuzz0b libice6 libjpeg-turbo8 libjpeg8 liblcms2-2 liblvm15 libpciaccess0 libpcsc-lite1 libsensors-config libsensors5 libsm6
libx11-xcb1 libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
libxcomposite libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrandr2 libxrender1 libxshmfence1 libxt6 libxtst6 libxv1
libxxf86dgal libxxf86vm1 openjdk-11-jre-headless session-migration x11-common x11-utils
Suggested packages:
default-jre libasound2-plugins alsu-utils cups-common libicms2-utils pcscd lm-sensors libnss-mdns fonts-ipafont-gothic fonts-ipafont-mincho
fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic mesa-utils
The following NEW packages will be installed:
alsa-topology-conf alsu-ucm-conf at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service fontconfig-config fonts-dejavu-core
fonts-dejavu-extra gsettings-desktop-schemas 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 libavahi-common3 libcupsys2 libdconf1 libdrm-amdgpu libdrm-intel
libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgif7 libgl1 libgl1-amber-dri libgl1-mesa-dri libglapi-mesa libglvnd0 libglx-mesa0 libglx0
libgraphite2-3 libharfbuzz0b libice6 libjpeg-turbo8 libjpeg8 liblcms2-2 liblvm15 libpciaccess0 libpcsc-lite1 libsensors-config libsensors5 libsm6
libx11-xcb1 libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
libxcomposite libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrandr2 libxrender1 libxshmfence1 libxt6 libxtst6 libxv1
libxxf86dgal libxxf86vm1 openjdk-11-jre-headless session-migration x11-common x11-utils
0 upgraded, 82 newly installed, 0 to remove and 36 not upgraded.
Need to get 88.2 MB of archives.
After this operation, 368 MB of additional disk space will be used.
Do you want to continue? [Y/n] yes
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 alsu-topology-conf all 1.2.5.1-2 [15.5 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libasound2-data all 1.2.6.1-1ubuntu1 [19.1 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libasound2 amd64 1.2.6.1-1ubuntu1 [390 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 alsu-ucm-conf all 1.2.6.3-1ubuntu1.10 [43.4 kB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libx16 amd64 2:1.8-1build1 [32.6 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libatspi2.0-0 amd64 2.44.0-3 [80.9 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 x11-common all 1:7.7+23ubuntu2 [23.4 kB]
```

i-0f4f968ae9799a0a4 (Jenkins-matser)

PublicIPs: 13.201.101.16 PrivateIPs: 172.31.9.149

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```
Safari File Edit View History Bookmarks Window Help
Private ap-south-1.console.aws.amazon.com EC2 Instance Connect | ap-south-1 Linux
CloudShell Feedback
ubuntu@ip-172-31-15-128:~$ java -version
openjdk version "17.0.10" 2024-01-16
OpenJDK Runtime Environment (build 17.0.10+7-Ubuntu-122.04.1)
OpenJDK 64-Bit Server VM (build 17.0.10+7-Ubuntu-122.04.1, mixed mode, sharing)
ubuntu@ip-172-31-15-128:~$ sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \
  https://pkg.jenkins.io/debian/jenkins.io-2023.key
--2024-03-06 14:34:52 -- https://pkg.jenkins.io/debian/jenkins.io-2023.key
Resolving pkg.jenkins.io (pkg.jenkins.io)... 151.101.154.133, 2a04:4e42:24:::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)|151.101.154.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3175 (3.1K) [application/pkcs-keys]
Saving to: '/usr/share/keyrings/jenkins-keyring.asc'

/usr/share/keyrings/jenkins-keyring.asc 100%[=====] 3.10K --.-KB/s in 0s
2024-03-06 14:34:52 (44.1 MB/s) - '/usr/share/keyrings/jenkins-keyring.asc' saved [3175/3175]

ubuntu@ip-172-31-15-128:~$ echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
ubuntu@ip-172-31-15-128:~$ sudo apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Ign:4 https://pkg.jenkins.io/debian binary/ InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:6 https://pkg.jenkins.io/debian binary/ Release [2044 B]
Get:7 https://pkg.jenkins.io/debian binary/ Release.gpg [833 B]
Get:8 https://pkg.jenkins.io/debian binary/ Packages [60.4 kB]
Fetched 63.3 kB in 1s (61.2 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-15-128:~$
```

i-0a64cd034cb32097b

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Safari File Edit View History Bookmarks Window Help

Private < >

Instances | EC2 | ap-south-1 EC2 Instance Connect | ap-south-1 Linux

aws Services Search [Option+S]

```
Get:5 https://pkg.jenkins.io/debian-stable binary/ Release [2044 B]
Get:6 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Hit:7 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:8 https://pkg.jenkins.io/debian-stable binary/ Packages [26.4 kB]
Fetched 29.3 kB in 1s (33.4 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-15-128:~$ sudo apt-get install jenkins
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  jenkins
0 upgraded, 1 newly installed, 0 to remove and 36 not upgraded.
Need to get 85.8 MB of archives.
After this operation, 86.6 MB of additional disk space will be used.
Get:1 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.440.1 [85.8 MB]
Fetched 85.8 MB in 5s (17.6 MB/s)
Selecting previously unselected package jenkins.
(Reading database ... 80426 files and directories currently installed.)
Preparing to unpack .../jenkins_2.440.1_all.deb ...
Unpacking jenkins (2.440.1) ...
Setting up jenkins (2.440.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /lib/systemd/system/jenkins.service.
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

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-172-31-15-128:~$
```

i-0a64cd034cb32097b

PublicIPs: 3.7.252.135 PrivateIPs: 172.31.15.128

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AWS Services Search [Option+S]

```
ubuntu@ip-172-31-9-149:~$ jenkins --version
2.440.1
ubuntu@ip-172-31-9-149:~$ 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-172-31-9-149:~$ sudo systemctl start jenkins
ubuntu@ip-172-31-9-149:~$ 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 2024-03-06 08:03:00 UTC; 5min ago
     Main PID: 5099 (java)
        Tasks: 37 (limit: 1121)
       Memory: 307.2M
          CPU: 45.166s
         CGroup: /system.slice/jenkins.service
                  └─5099 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Mar 06 08:02:24 ip-172-31-9-149 jenkins[5099]: d129429eee4341le86135345af227236
Mar 06 08:02:24 ip-172-31-9-149 jenkins[5099]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Mar 06 08:02:24 ip-172-31-9-149 jenkins[5099]: ****
Mar 06 08:02:24 ip-172-31-9-149 jenkins[5099]: ****
Mar 06 08:02:24 ip-172-31-9-149 jenkins[5099]: ****
Mar 06 08:02:24 ip-172-31-9-149 jenkins[5099]: 2024-03-06 08:03:00.775+0000 [id=30]      INFO    jenkins.InitReactorRunner$1#onAttained: Completed ini>
Mar 06 08:03:00 ip-172-31-9-149 jenkins[5099]: 2024-03-06 08:03:00.815+0000 [id=22]      INFO    hudson.lifecycle.Lifecycle#onReady: Jenkins is fully >
Mar 06 08:03:00 ip-172-31-9-149 systemd[1]: Started Jenkins Continuous Integration Server.
Mar 06 08:03:04 ip-172-31-9-149 jenkins[5099]: 2024-03-06 08:03:04.697+0000 [id=45]      INFO    h.m.DownloadServiceDownloadable#load: Obtained the us>
Mar 06 08:03:04 ip-172-31-9-149 jenkins[5099]: 2024-03-06 08:03:04.698+0000 [id=45]      INFO    hudson.util.Retrier#start: Performed the action check>
lines 1-20/20 (END)
```

i-0f4f968ae9799a0a4 (Jenkins-matser)

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And open port 8080 on your server here

AWS Services Search [Option+S] Mumbai pooja.bhavani @ poojabhavani ▾

EC2 > Security Groups > sg-0ea43158b3ce85e14 - launch-wizard-7 > Edit inbound rules

Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

Security group rule ID	Type <small>Info</small>	Protocol <small>Info</small>	Port range	Source <small>Info</small>	Description - optional <small>Info</small>
sgr-012e70642212827b9	SSH	TCP	22	Custom ▾	<input type="text"/> 0.0.0.0/0 <small>X</small>
sgr-0f6579bb094f9eaf4	HTTP	TCP	80	Custom ▾	<input type="text"/> 0.0.0.0/0 <small>X</small>
sgr-0b7fac60aadbb75c5	HTTPS	TCP	443	Custom ▾	<input type="text"/> 0.0.0.0/0 <small>X</small>

[Add rule](#)

⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only. X

[Cancel](#) [Preview changes](#) [Save rules](#)

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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:

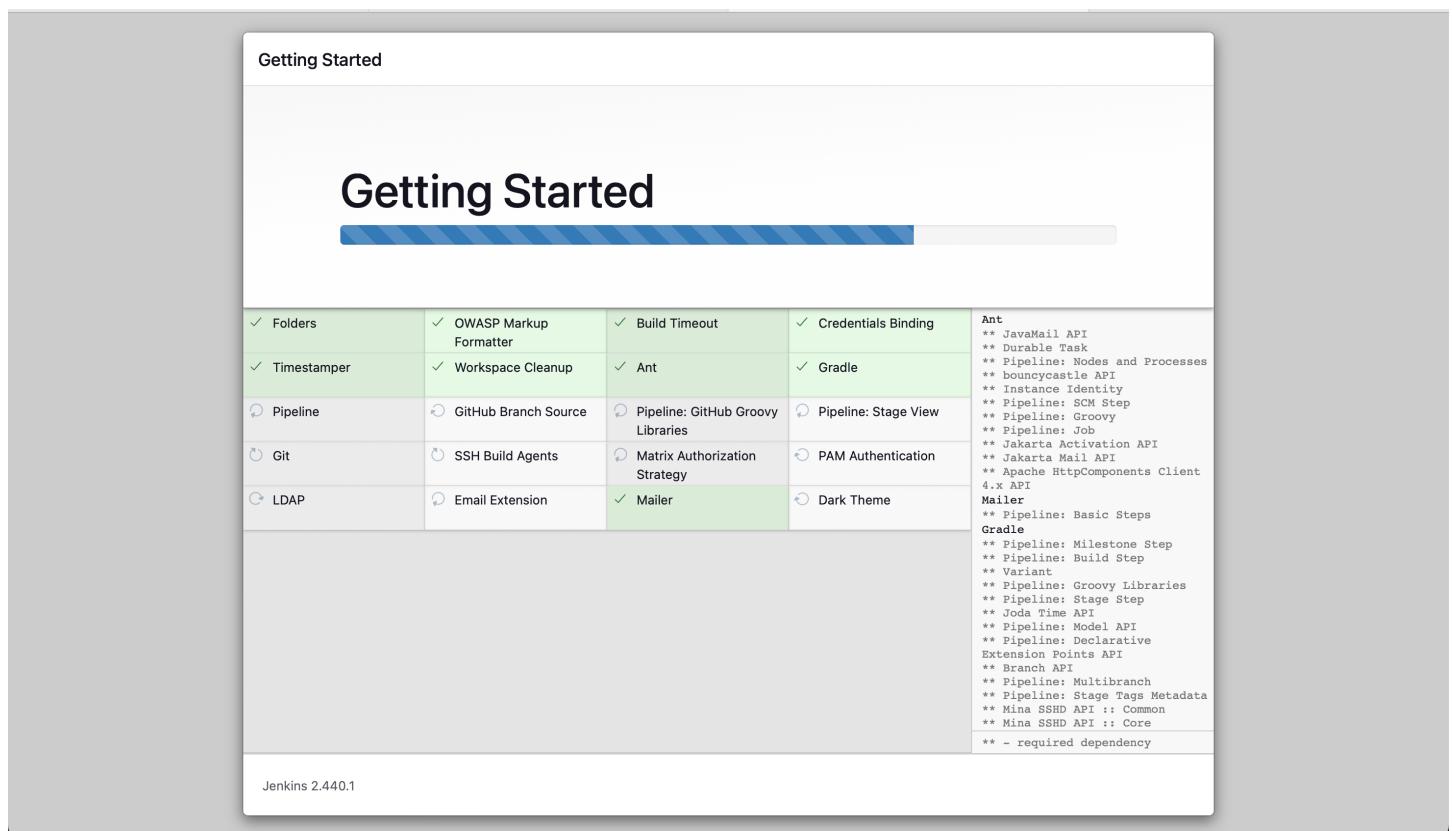
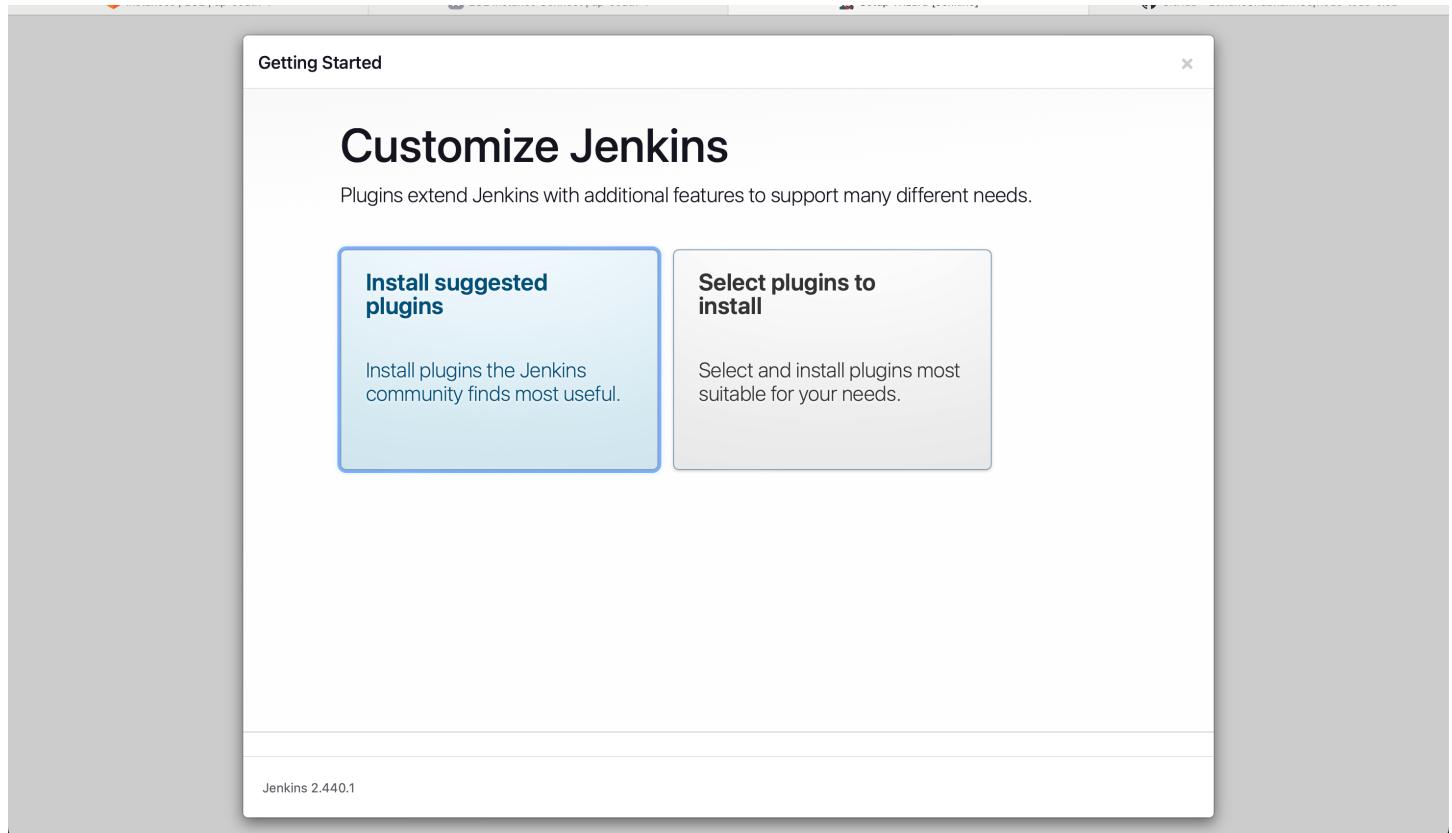
`/var/lib/jenkins/secrets/initialAdminPassword`

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

Administrator password

[Continue](#)

ubuntu@ip-172-31-9-149:~\$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword



Now, create user

Instances | DC2 | dp-south-1 | DC2 Instance Connect | dp-south-1 | Setup Wizard [Jenkins] | GitHub - JenkinsSoftware/jenkins:Jenkins

Getting Started

Create First Admin User

Username

Password

Confirm password

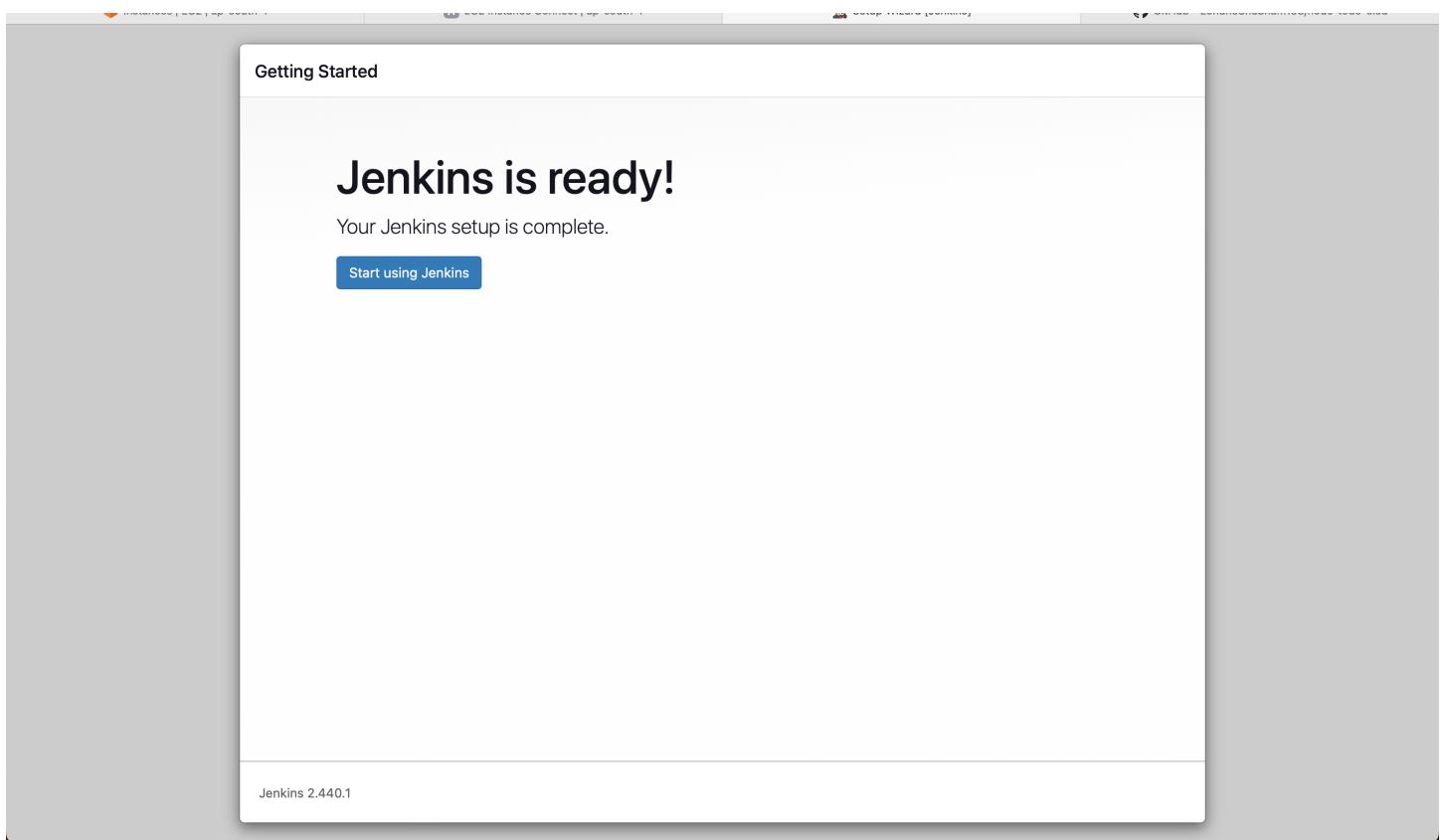
Full name

E-mail address

Jenkins 2.440.1

Skip and continue as admin

Save and Continue



Select new item and create a free style project

Configure**General**Enabled  General Source Code Management Build Triggers Build Environment Build Steps Post-build Actions

Description

Plain text [Preview](#) Discard old builds  GitHub project This project is parameterized  Throttle builds  Execute concurrent builds if necessary Advanced **Source Code Management** Save

Apply