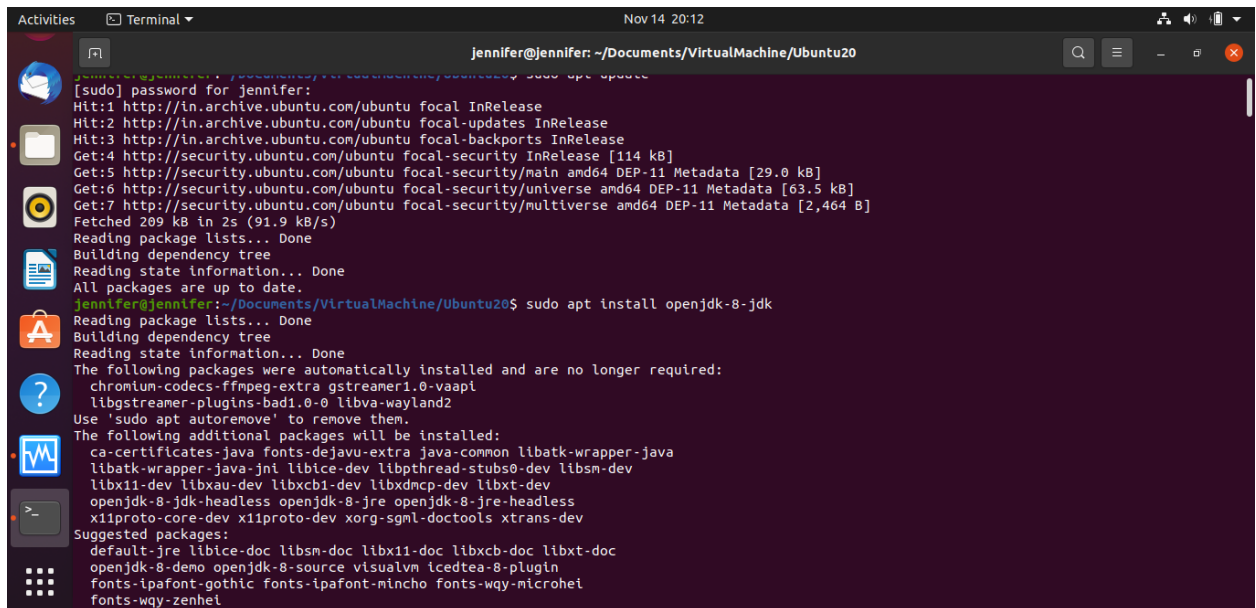


INDIAN INSTITUTE OF INFORMATION TECHNOLOGY- DHARWAD DEVOPS ASSIGNMENT 3

JENKINS DOCKER KUBERNETES PIPELINE

[NOTE : As we couldn't install Jenkins using the Vagrant file, we used Nginx server for Jenkins installation.]

1. Install Java



```
Activities  Terminal  Nov 14 20:12
jennifer@jennifer: ~/Documents/VirtualMachine/Ubuntu20

[sudo] password for jennifer:
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [29.0 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [63.5 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [2,464 B]
Fetched 209 kB in 2s (91.9 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.

jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$ sudo apt install openjdk-8-jdk
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi
  libgstreamer-plugins-bad1.0-0 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ca-certificates-java 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-8-jdk-headless openjdk-8-jre openjdk-8-jre-headless
  x11proto-core-dev x11proto-dev xorg-sgml-doctools xtrans-dev
Suggested packages:
  default-jre libice-doc libsm-doc libx11-doc libxcb-doc libxt-doc
  openjdk-8-demo openjdk-8-source visualvm icedtea-8-plugin
  fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei
  fonts-wqy-zenhei
```

```
Activities Terminal Nov 14 20:13
jennifer@jennifer: ~/Documents/VirtualMachine/Ubuntu20

provide /usr/bin/appletviewer (appletviewer) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jconsole to pro
vide /usr/bin/jconsole (jconsole) in auto mode
Processing triggers for fontconfig (2.13.1-2ubuntu3) ...
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for ca-certificates (20210119-20.04.2) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
done.
Processing triggers for sgml-base (1.29.1) ...
Setting up x11proto-dev (2019.2-1ubuntu1) ...
Setting up libxau-dev:amd64 (1:1.0.9-0ubuntu1) ...
Setting up libice-dev:amd64 (2:1.0.10-0ubuntu1) ...
Setting up libsm-dev:amd64 (2:1.2.3-1) ...
Setting up libxdmcp-dev:amd64 (1:1.1.3-0ubuntu1) ...
Setting up x11proto-core-dev (2019.2-1ubuntu1) ...
Setting up libxcb1-dev:amd64 (1.14-2) ...
Setting up libx11-dev:amd64 (2:1.6.9-2ubuntu1.2) ...
Setting up libxt-dev:amd64 (1:1.1.5-1) ...
jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$ java -version
openjdk version "1.8.0_292"
OpenJDK Runtime Environment (build 1.8.0_292-8u292-b10-0ubuntu1-20.04-b10)
OpenJDK 64-Bit Server VM (build 25.292-b10, mixed mode)
jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$
```

2. Install Jenkins

```
Activities Terminal Nov 14 20:14
jennifer@jennifer: ~/Documents/VirtualMachine/Ubuntu20

jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$ wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo apt-key add -
OK
jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$ sudo sh -c 'echo deb https://pkg.jenkins.io/debian-stable binary/ > \
> /etc/apt/sources.list.d/jenkins.list'
jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$ sudo apt-get update
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu focal-security InRelease
Ign:5 https://pkg.jenkins.io/debian-stable binary/ InRelease
Get:6 https://pkg.jenkins.io/debian-stable binary/ Release [2,044 B]
Get:7 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Get:8 https://pkg.jenkins.io/debian-stable binary/ Packages [20.9 kB]
Fetched 23.8 kB in 2s (12.6 kB/s)
Reading package lists... Done
jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$
```

```
Activities Terminal Nov 14 21:15
jennifer@jennifer: ~/Documents/VirtualMachine/Ubuntu20

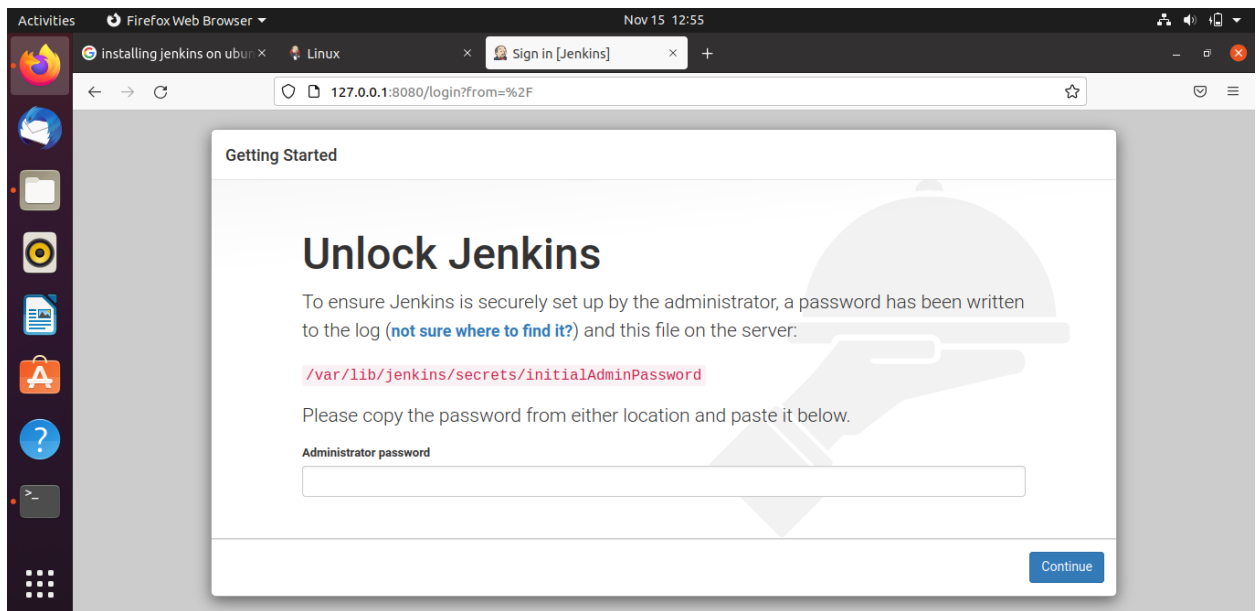
jennifer@jennifer:~/Documents/VirtualMachine/Ubuntu20$ sudo apt-get install jenkins
Reading package lists... Done
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi
  libgstreamer-plugins-bad1.0-0 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  daemon net-tools
The following NEW packages will be installed:
  daemon jenkins net-tools
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 72.2 MB of archives.
After this operation, 73.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 daemon amd64 0.6.4-1build2 [96.3 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 net-tools amd64 1.60+git20180626.aebd88e-1ubuntu1 [196 kB]
Get:3 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.303.3 [71.9 MB]
Fetched 55.9 MB in 58min 3s (16.0 kB/s)
Selecting previously unselected package daemon.
(Reading database ... 202511 files and directories currently installed.)
Preparing to unpack .../daemon_0.6.4-1build2_amd64.deb ...
Unpacking daemon (0.6.4-1build2) ...
Selecting previously unselected package net-tools.
Preparing to unpack .../net-tools_1.60+git20180626.aebd88e-1ubuntu1_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Selecting previously unselected package jenkins.
Preparing to unpack .../jenkins_2.303.3_all.deb ...
Unpacking jenkins (2.303.3) ...
Setting up net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
```

4. Install Nginx

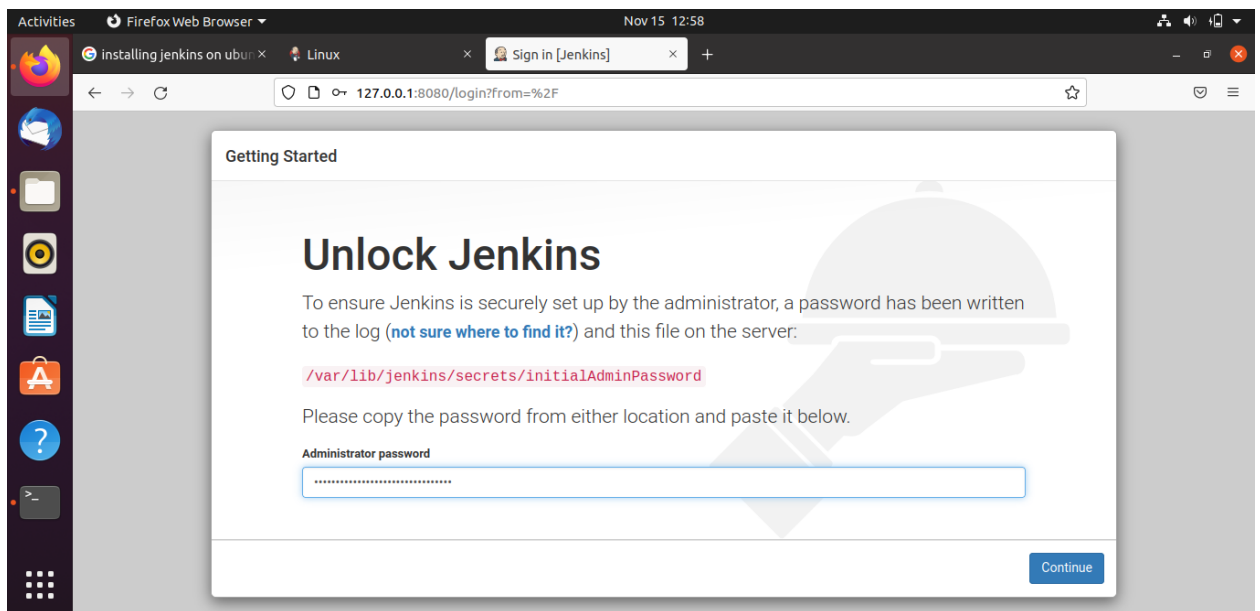
```
Activities Terminal Nov 15 12:37
jennifer@jennifer: ~

jennifer@jennifer:~$ sudo apt-get install nginx
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi
  libgstreamer-plugins-bad1.0-0 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter
  libnginx-mod-mail libnginx-mod-stream nginx-common nginx-core
Suggested packages:
  fcgiwrap nginx-doc
The following NEW packages will be installed:
  libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter
  libnginx-mod-mail libnginx-mod-stream nginx nginx-common nginx-core
0 upgraded, 7 newly installed, 0 to remove and 0 not upgraded.
Need to get 603 kB of archives.
After this operation, 2,134 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 nginx-common all 1.18.0-0ubuntu1.2 [37.5 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libnginx-mod-http-image-filter amd64 1.18.0-0ubuntu1.2 [14.4 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libnginx-mod-http-xslt-filter amd64 1.18.0-0ubuntu1.2 [12.7 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libnginx-mod-mail amd64 1.18.0-0ubuntu1.2 [42.5 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libnginx-mod-stream amd64 1.18.0-0ubuntu1.2 [67.3 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 nginx-core amd64 1.18.0-0ubuntu1.2 [425 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 nginx all 1.18.0-0ubuntu1.2 [3,620 B]
Fetched 603 kB in 1s (715 kB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 203514 files and directories currently installed.)
Preparing to unpack .../0-nginx-common_1.18.0-0ubuntu1.2_all.deb ...
Unpacking nginx-common (1.18.0-0ubuntu1.2) ...
```

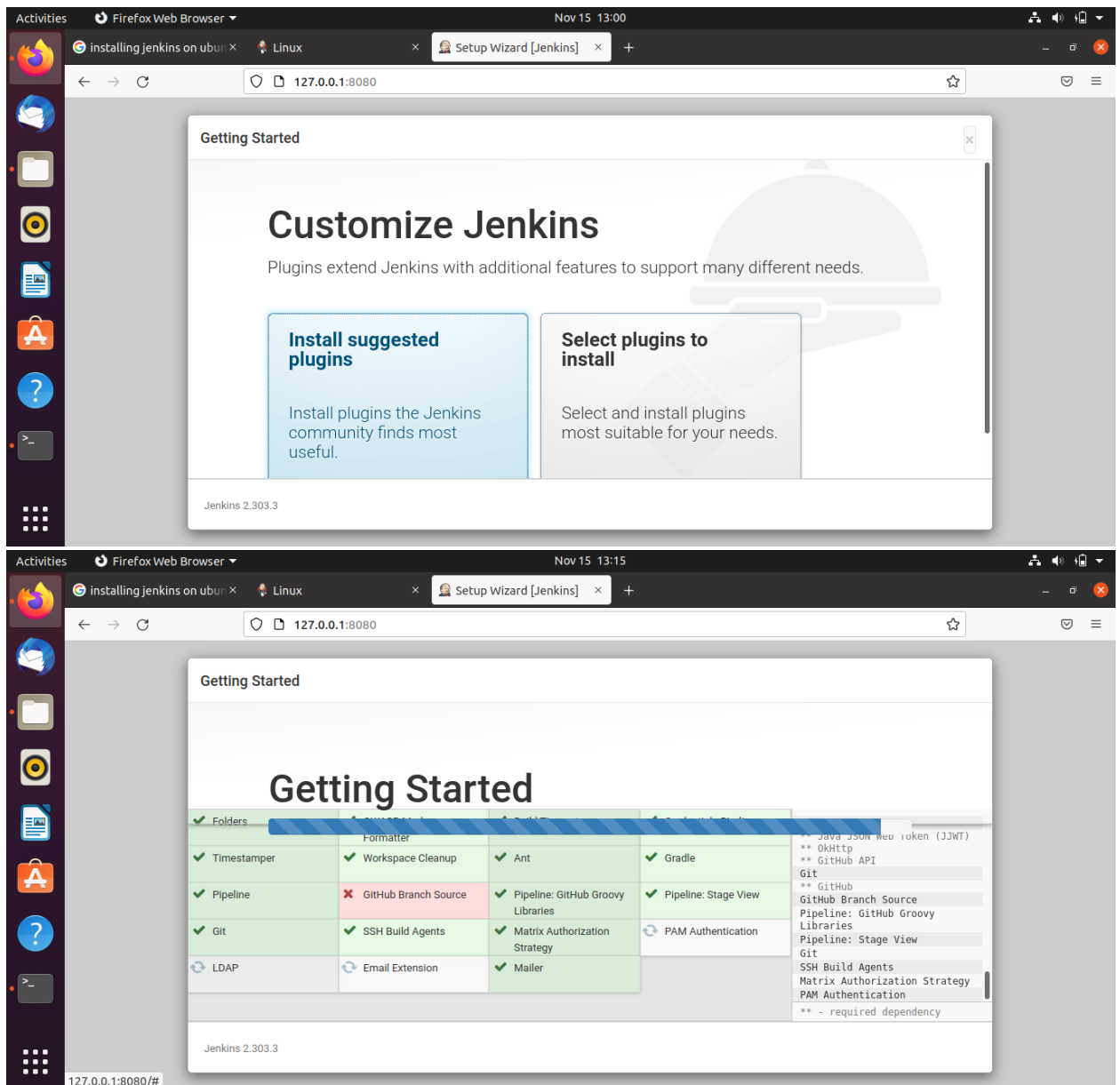
5. Verify Jenkins Installation



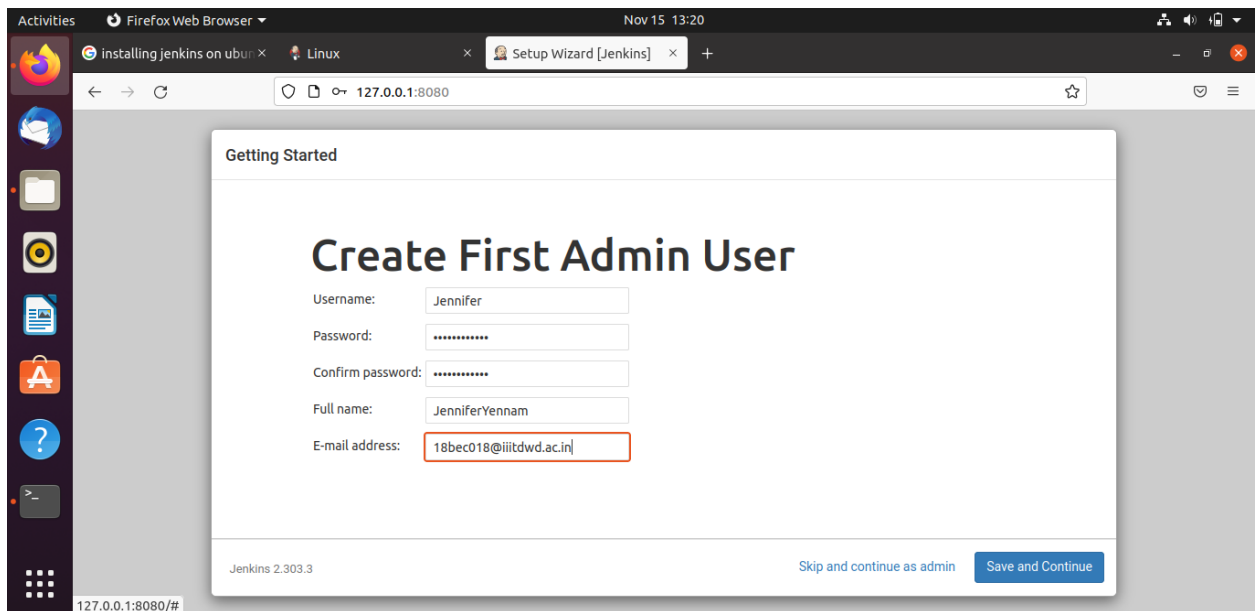
6. Fetch default Jenkins password



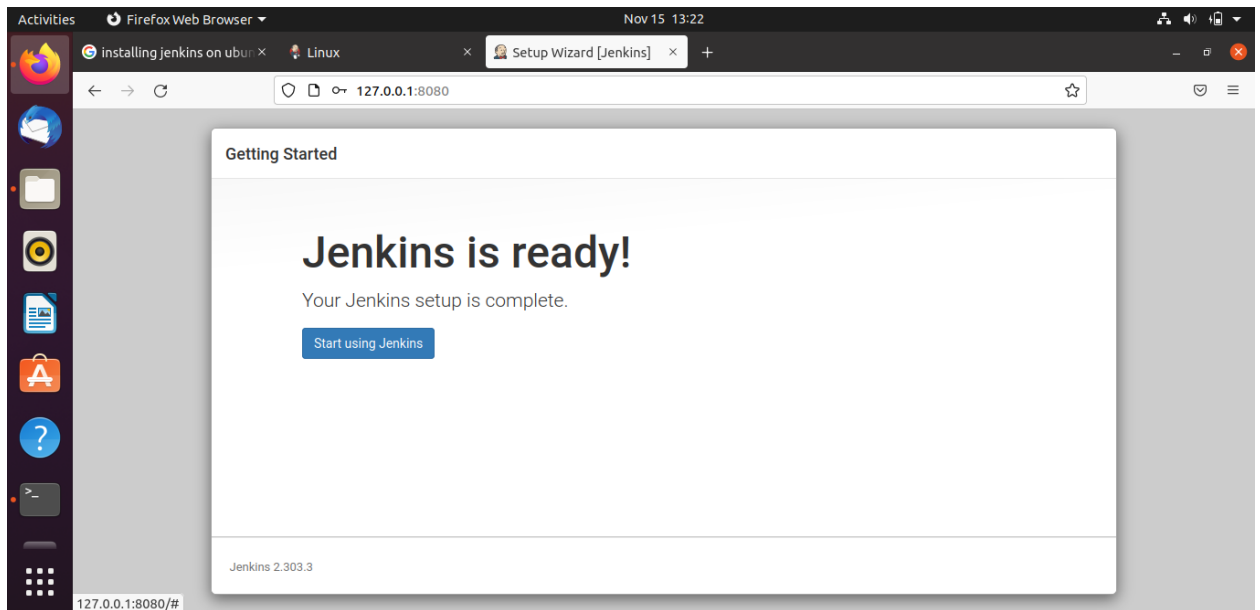
7. Customize Jenkins and install suggested plugin

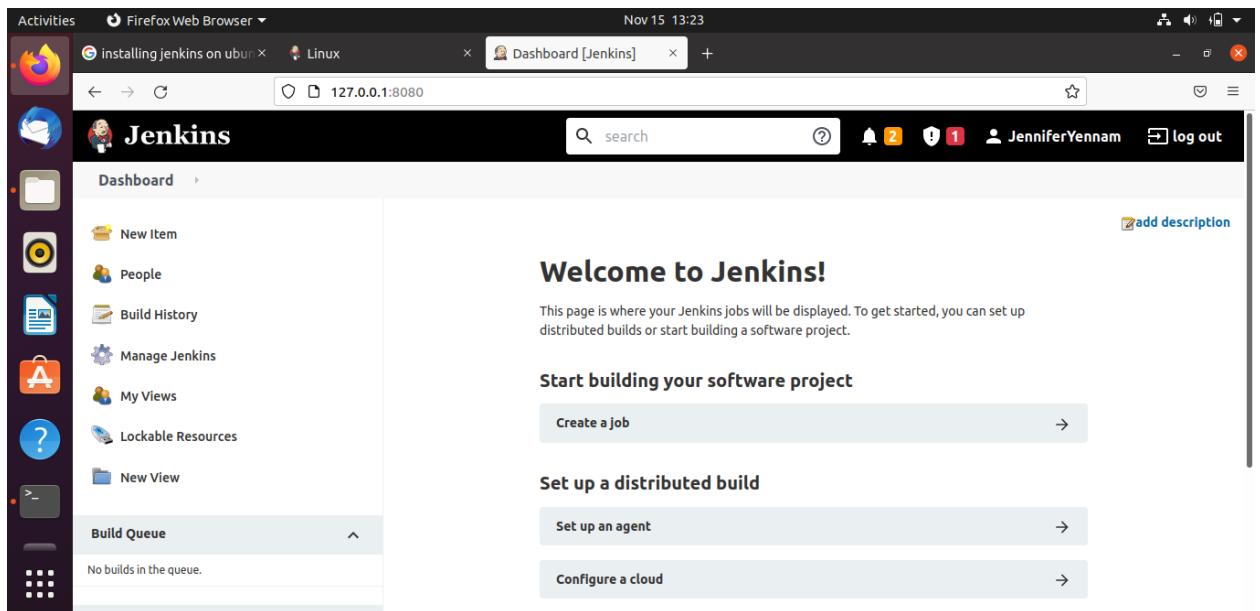


8. After successful login setup username and password

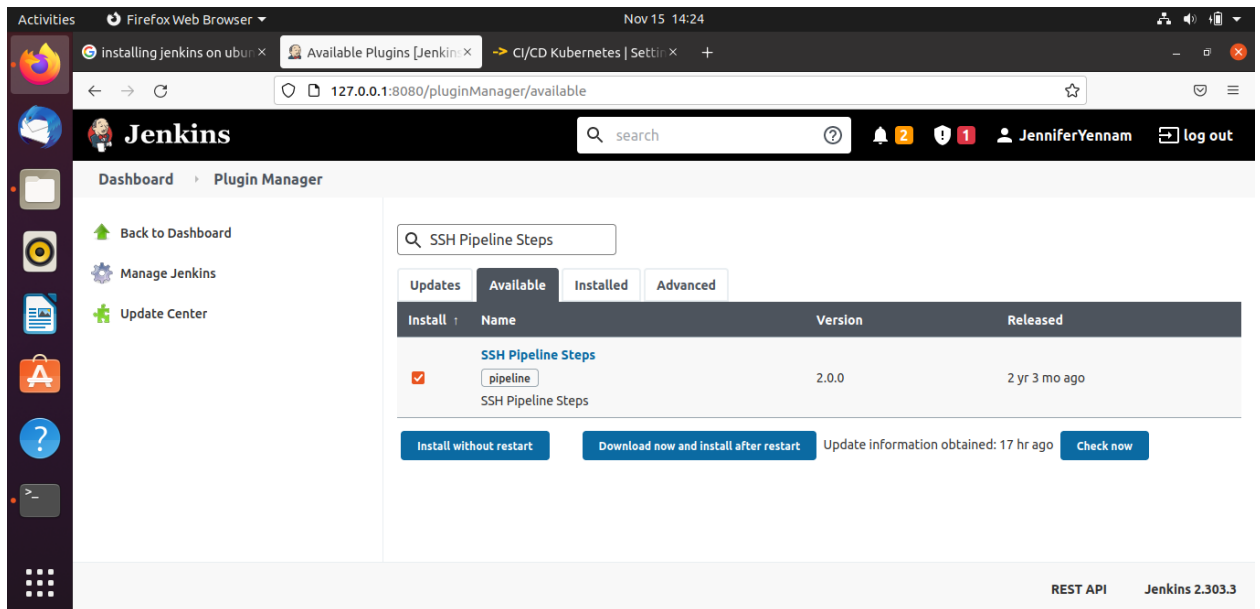


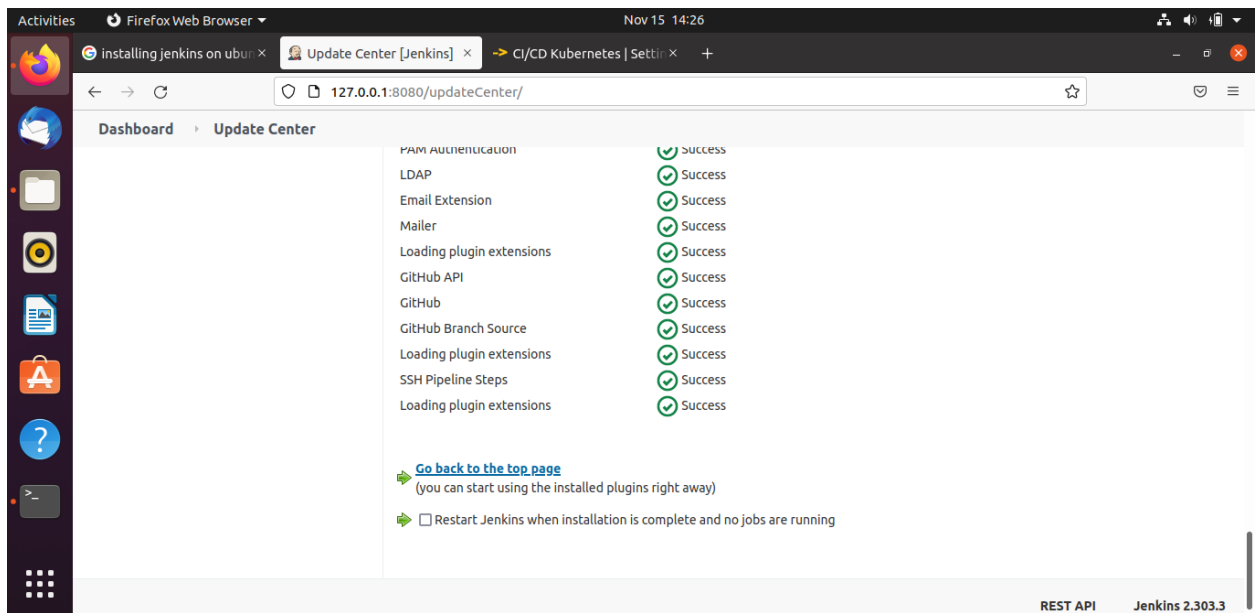
Now the jenkins is ready to use :



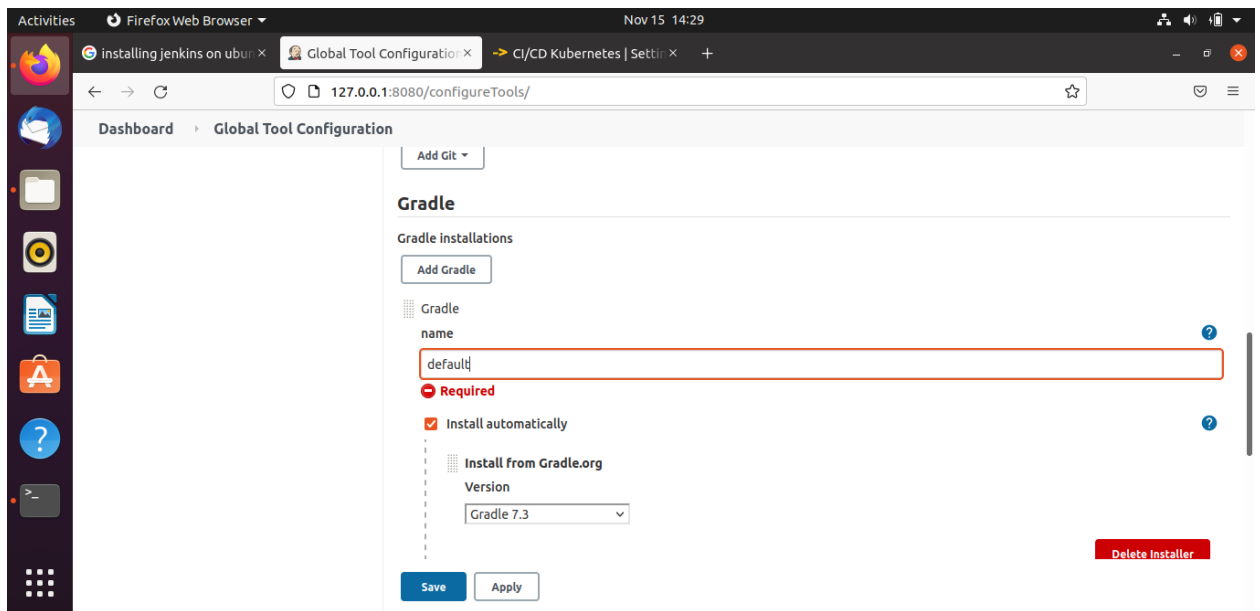


9. Jenkins - Install “SSH Pipeline Steps” plugin and “Gradle”





Setup Gradle



10. Install Docker on jenkins server

Install Docker :


```
Activities Terminal Nov 15 14:36
jennifer@jennifer: ~
jennifer@jennifer:~$ sudo apt install docker.io
[sudo] password for jennifer:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi libgstreamer-plugins-bad1.0-0 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  bridge-utils containerd pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd docker.io pigz runc ubuntu-fan
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 74.2 MB of archives.
After this operation, 360 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 pigz amd64 2.4-1 [57.4 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 bridge-utils amd64 1.6-2ubuntu1 [30.5 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 runc amd64 1.0.1-0ubuntu2-20.04.1 [4,155 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 containerd amd64 1.5.5-0ubuntu3-20.04.1 [33.0 MB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 docker.io amd64 20.10.7-0ubuntu5-20.04.2 [36.9 MB]
Get:6 http://in.archive.ubuntu.com/ubuntu focal/main amd64 ubuntu-fan all 0.12.13 [34.5 kB]
Fetched 74.2 MB in 21s (3,577 kB/s)
Preconfiguring packages ...
Selecting previously unselected package pigz.
(Reading database ... 203592 files and directories currently installed.)
Preparing to unpack .../0-pigz_2.4-1_amd64.deb ...
Unpacking pigz (2.4-1) ...
Selecting previously unselected package bridge-utils.
Preparing to unpack .../1-bridge-utils_1.6-2ubuntu1_amd64.deb ...
Unpacking bridge-utils (1.6-2ubuntu1) ...
```

Docker version :

```
Activities Terminal Nov 15 14:37
jennifer@jennifer: ~
jennifer@jennifer:~$ docker version
Client:
Version:      20.10.7
API version:  1.41
Go version:   go1.13.8
Git commit:   20.10.7-0ubuntu5-20.04.2
Built:        Mon Nov  1 00:34:17 2021
OS/Arch:      linux/amd64
Context:      default
Experimental: true
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get http://%2Fvar%2Frun%2Fdocker.sock/v1.24/version: dial_unix /var/run/docker.sock: connect: permission denied
jennifer@jennifer:~$
```

To avoid the error : Permission denied, add Current User to Docker Group

```
Activities Terminal Nov 15 15:03
jennifer@jennifer: ~
jennifer@jennifer:~$ sudo usermod -aG docker $JENNIFER
Usage: usermod [options] LOGIN

Options:
  -b, --badnames          allow bad names
  -c, --comment COMMENT   new value of the GECOS field
  -d, --home HOME_DIR     new home directory for the user account
  -e, --expiredate EXPIRE_DATE set account expiration date to EXPIRE_DATE
  -f, --inactive INACTIVE set password inactive after expiration
                           to INACTIVE
  -g, --gid GROUP          force use GROUP as new primary group
  -G, --groups GROUPS      new list of supplementary GROUPS
  -a, --append             append the user to the supplemental GROUPS
                           mentioned by the -G option without removing
                           the user from other groups
  -h, --help              display this help message and exit
  -l, --login NEW_LOGIN    new value of the login name
  -L, --lock              lock the user account
  -m, --move-home         move contents of the home directory to the
                           new location (use only with -d)
  -o, --non-unique         allow using duplicate (non-unique) UID
  -p, --password PASSWORD use encrypted password for the new password
  -R, --root CHROOT_DIR    directory to chroot into
  -P, --prefix PREFIX_DIR  prefix directory where are located the /etc/* files
  -s, --shell SHELL        new login shell for the user account
  -u, --uid UID            new UID for the user account
  -U, --unlock            unlock the user account
  -v, --add-subuids FIRST-LAST add range of subordinate uids
  -V, --del-subuids FIRST-LAST remove range of subordinate uids
  -w, --add-subgids FIRST-LAST add range of subordinate gids
  -W, --del-subgids FIRST-LAST remove range of subordinate gids
  -Z, --selinux-user SEUSER new SELinux user mapping for the user account
```

Error debugged:

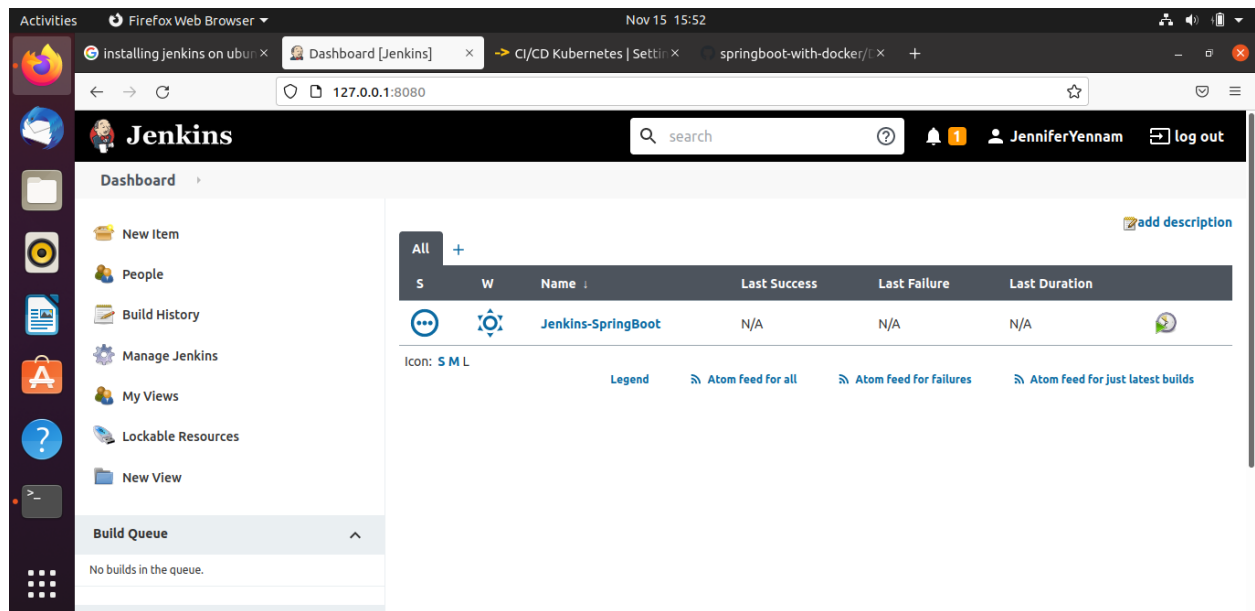
```
Activities Terminal Nov 15 15:34
jennifer@jennifer: ~
jennifer@jennifer:~$ docker version

Client:
 Version:      20.10.7
 API version:  1.41
 Go version:   go1.13.8
 Git commit:   20.10.7-0ubuntu5~20.04.2
 Built:        Mon Nov 1 00:34:17 2021
 OS/Arch:      linux/amd64
 Context:      default
 Experimental: true

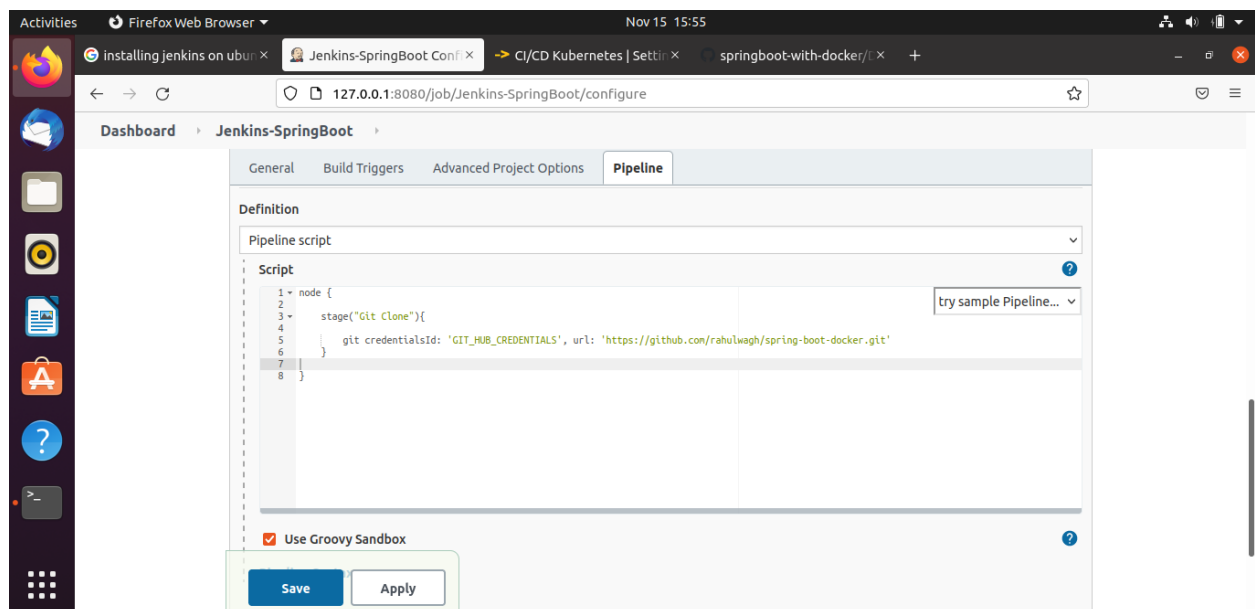
Server:
 Engine:
  Version:      20.10.7
  API version:  1.41 (minimum version 1.12)
  Go version:   go1.13.8
  Git commit:   20.10.7-0ubuntu5~20.04.2
  Built:        Fri Oct 22 00:45:53 2021
  OS/Arch:      linux/amd64
  Experimental: false
 containerd:
  Version:      1.5.5-0ubuntu3~20.04.1
  GitCommit:
 runc:
  Version:      1.0.1-0ubuntu2~20.04.1
  GitCommit:
 docker-init:
  Version:      0.19.0
  GitCommit:
jennifer@jennifer:~$
```

Then Add Jenkins User to Docker Group

11. Take a look at Spring Boot Application



12. Write the Pipeline script



13. Jenkins store git credentials

Activities Firefox Web Browser Nov 15 16:17

installing jenkins on ubun x New Credentials [Jenkins x] CI/CD Kubernetes | Settin x GitHub - rahulwagh/sprin x +

127.0.0.1:8080/credentials/store/system/domain/_/newCredentials

Dashboard > Credentials > System > Global credentials (unrestricted)

Back to credential domains

Add Credentials

Kind

Username with password

Scope

Global (Jenkins, nodes, items, all child items, etc)

Username

JenniferYennam

☐ Treat username as secret

Password

ID

GIT_HUB_CREDENTIALS

Description

Git hub Credentiald

OK