## **EC2 Machine Setup**

- Install necessary tools Git (pre installed in EC2 Ubuntu 20.04 LTS), Maven, Jenkins, Ansible, kubernetes etc.
- a. installed Maven using "sudo apt install maven"
- b. installed Ansible using "sudo apt install ansible"
- c. Install kubernetes

## Install kubeadm, kubelet, kubectl

\$ sudo wget https://raw.githubusercontent.com/lerndevops/labs/master/scripts/installK8S-v1-23.sh -P /tmp

\$ sudo chmod 755 /tmp/installK8S-v1-23.sh

\$ sudo bash /tmp/installK8S-v1-23.sh

\$ sudo kubeadm init --ignore-preflight-errors=all

\$ sudo mkdir -p \$HOME/.kube \$ sudo cp -i /etc/kubernetes/admin.conf \$HOME/.kube/config \$sudo chown \$(id -u):\$(id -g) \$HOME/.kube/config

Install Jenkins

Install Java Development Kit (JDK)

## \$ sudo apt install openjdk-11-jdk

Jenkins Repository Key

\$ wget -q -0 - https://pkg.jenkins.io/debian/jenkins.io.key | sudo apt-key add -

Jenkins Repository

\$ sudo sh -c 'echo deb <a href="http://pkg.jenkins.io/debian-stablebinary/">http://pkg.jenkins.io/debian-stablebinary/</a> > /etc/apt/sources.list.d/ jenkins.list'

## \$ sudo apt update

```
ubuntu@ip-172-31-29-137:/etc/apt$ sudo apt update
iit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
iit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease
iit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease
                                                                                                                                                                                                                                                                                                                                                                                                            {} ghp_z9iKA
Hiti3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease
[gp:5 https://pkg.jenkins.io/debian-stable binary/ InRelease
[Get:6 https://pkg.jenkins.io/debian-stable binary/ Release [2044 B]
Get:7 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Hiti8 http://security.ubuntu.com/ubuntu focal-security InRelease
Hiti4 https://packages.cloud.google.com/apt kubernetes-xenial InRelease
Igp:7 https://pkg.jenkins.io/debian-stable binary/ Release.gpg
Reading package lists... Done
M: GPG error: https://pkg.jenkins.io/debian-stable binary/ Release: The following signatures couldn't be verified because the pub
lic key is not available: NO.PUBKEY SBA3105TEF5975CA
E: The repository https://pkg.jenkins.io/debian-stable binary/ Release' is not signed
                                                                                                                                                                                                                                                                                                                                                                                                            {} Tech - BitB
                                                                                                                                                                                                                                                                                                                                                                                                            {} Official - B
 inc key is not available: NO_PUBREY SBA3ID5/EFS9/SCA

E: The repository 'https://pkg.jenkins.io/debian-stable binary/ Release' is not signed.

L: Updating from such a repository can't be done securely, and is therefore disabled by default.

E: See apt-secure(8) manpage for repository creation and user configuration details.

L: See apt-secure(8) manpage for repository creation and user configuration details.

L: See apt-secure(8) manpage for repository creation and user configuration details.
                                                                                                                                                                                                                                                                                                                                                                                                            {} files create
Executing: /tmp/apt-key-gpghome.gYwot1Qrr8/gpg.1.sh --keyserver keyserver.ubuntu.com --recv-keys 5BA31D57EF5975CA
gpg: key 5BA31D57EF5975CA: public key "Jenkins Project <jenkinsci-board@googlegroups.com>" imported
 spg: Total number processed: 1
spg: imported: 1
keading state information... νone
                                                                                                                                                                                                                                                                                                                                                                                                            {} pull
                                                                                                                                                                                                                                                                                                                                                                                                             {} files creat
 The following additional packages will be installed:
net-tools
 0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 95.8 MB of archives.
                                                                                                                                                                                                                                                                                                                                                                                                             {} pull
 After this operation, 99.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 net-tools amd64 1.60+git20180626.aebd88e-1ubuntu1 [196 kB]
Get:2 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.401.1 [95.6 MB]
Fetched 95.8 MB in 25s (3800 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 102972 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20180626.aebd88e-1ubuntu1_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Selecting previously unselected package invises
                                                                                                                                                                                                                                                                                                                                                                                                             {} pull_optin
                                                                                                                                                                                                                                                                                                                                                                                                             {} Bitbucket
Onpacking net-tools (1.60-git20180620.aebus88-lubuntu1) ...

Preparing to unpack .../jenkins_2.401.1_all.deb ...

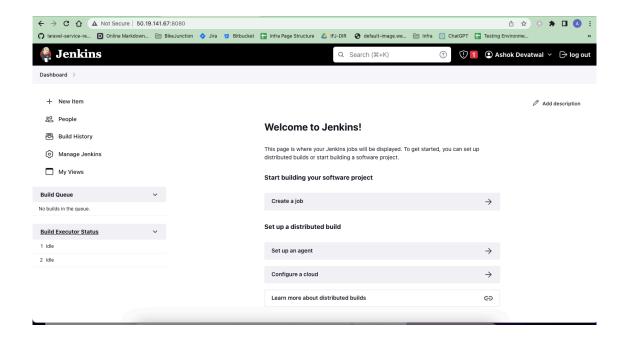
Jnpacking jenkins (2.401.1) ...

Setting up net-tools (1.60+git20180626.aebu88e-lubuntu1) ...
 Setting up jenkins (2.401.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /lib/systemd/system/jenkins.service.
     ocessing triggers for man-db (2.9.1-1) ...
ocessing triggers for systemd (245.4-4ubuntu3.21)
```

## \$ sudo apt install Jenkins

Copy initial password

\$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword



### **Login to Jenkins**

#### **Install Docker**

\$ sudo apt install apt-transport-https ca-certificates curl software-properties-common

```
ubuntu@ip-172-31-29-137:~$ sudo apt install apt-transport-https ca-certificates curl software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (2023031lubuntu0.20.04.1).
ca-certificates set to manually installed.
curl is already the newest version (7.68.0-lubuntu2.18).
curl set to manually installed.
software-properties-common is already the newest version (0.99.9.11).
software-properties-common set to manually installed.
The following NEW packages will be installed:
    apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 30 not upgraded.
Need to get 1704 B of archives.
After this operation, 162 kB 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 focal-updates/universe amd64 apt-transport-https all 2.0.9 [1704 B]
Fetched 1704 B in 0s (94.6 kB/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 103035 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.0.9_all.deb ...
Unpacking apt-transport-https (2.0.9) ...
setting up apt-transport-https (2.0.9) ...
ubuntu@ip-172-31-29-137:~5
```

\$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /usr/ share/keyrings/docker-archive-keyring.gpg

```
ubuntu@ip-172-31-29-137:-$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /usr/share
/keyrings/docker-archive-keyring.gpg
ubuntu@ip-172-31-29-137:-$ echo "deb [arch=amd64 signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] https://do
wnload.docker.com/linux/ubuntu focal stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
ubuntu@ip-172-31-29-137:-$ []
```

\$ echo "deb [arch=amd64 signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] https://download.docker.com/linux/ubuntu focal stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

```
ubuntu@ip=172-31-29-137:-/abc_technologies$ sudo apt install python3-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
binutils binutils-common binutils-x86-64-linux-gnu build-essential cpp cpp-9 dpkg-dev fakeroot g++ g++-9 gcc gcc-9 gcc-9-base
libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 libatomic1 libbinutils libc-dev-bin libc6-dev
libccl-0 libcrypt-dev libctf-nobfd0 libctf0 libdpkg-perl libexpatl-dev libfakeroot libfile-fcntllock-perl libgcc-9-dev libgomp1
libisl22 libitm1 liblsan0 libmpc3 libpython3-dev libpython3.8-dev libpuadmath0 libstdc+++9-dev libtsan0 libusan1 linux-libc-dev
make manpages-dev python-pip-whl python3-dev python3-wheel python3.8-dev zliblg-dev
Suggested packages:
binutils-doc cpp-doc gcc-9-locales debian-keyring g++-multilib g++-9-multilib gcc-9-doc gcc-multilib autoconf automake libtool flex
bison gdb gcc-doc gcc-9-multilib glibc-doc bzr libstdc++-9-doc make-doc
The following NEW packages will be installed:
binutils binutils-common binutils-x86-64-linux-gnu build-essential cpp cpp-9 dpkg-dev fakeroot g++ g++-9 gcc gcc-9 gcc-9-base
libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 libatomic1 libbinutils libc-dev-bin libc6-dev
libccl-0 libcrypt-dev libctf-nobfd0 libctf0 libdpkg-perl libexpstl-dev libstfe-fortllock-perl libgc-9-dev libgcmp1
libisl22 libitm1 liblsan0 libmpc3 libpython3-dev python3-pip python3-wheel python3.8-dev zliblg-dev

upgraded, 50 newly installed, 0 to remove and 30 not upgraded.

Need to get 52.2 MB of archives.

After this operation, 228 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 focal-updates/main amd64 libctfo amd64 2.34-6ubuntul.6 [47.4 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 libctfo amd64 2.34-6ubuntul.6 [46.6 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-u
```

\$ sudo apt update

\$ sudo apt install docker-ce docker-ce-cli containerd.io

\$ sudo apt install python3-pip

```
Collecting docker
    Downloading docker-6.1.3-py3-none-any.whl (148 kB)
                                                                               | 148 kB 21.9 MB/s
 Collecting packaging>=14.0
    Downloading packaging-23.1-py3-none-any.whl (48 kB)
                                                                              | 48 kB 7.0 MB/s
Collecting urllib3>=1.26.0

Downloading urllib3-2.0.3-py3-none-any.whl (123 kB)
Collecting requests>=2.26.0

Downloading requests-2.31.0-py3-none-any.whl (62 kB)

| 62 kB 1.6 MB/s
                                                                             | 123 kB 24.8 MB/s
 Collecting websocket-client>=0.32.0
                                                                                 56 kB 4.0 MB/s
   Downloading charset_normalizer-3.2.0-cp38-cp38-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (199 kB)
                                                                              | 199 kB 33.0 MB/s
Requirement already satisfied: idna<4,>=2.5 in /usr/lib/python3/dist-packages (from requests>=2.26.0->docker) (2.8)
Requirement already satisfied: certifi>=2017.4.17 in /usr/lib/python3/dist-packages (from requests>=2.26.0->docker) (2019.11.28)
Requirement already satisfied: Certiff=2017.4.17 in /usr/inb/pythons/dist-packages (from requests)-2.20.0-Judcker) (2019.11.20)

Installing collected packages: packaging, urllib3, charset-normalizer, requests, websocket-client, docker

WARNING: The script normalizer is installed in '/home/ubuntu/.local/bin' which is not on PATH.

Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.

WARNING: The script wsdump is installed in '/home/ubuntu/.local/bin' which is not on PATH.

Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.

Successfully installed charset-normalizer-3.2.0 docker-6.1.3 packaging-23.1 requests-2.31.0 urllib3-2.0.3 websocket-client-1.6.1
    untu@ip-172-31-29-137:~/abc_technologies$
```

## Install grafana

```
$ sudo apt-get install -y apt-transport-https
$ sudo apt-get install -y software-properties-common wget
$ sudo wget -q -O /usr/share/keyrings/grafana.key <a href="https://apt.grafana.com/gpg.key">https://apt.grafana.com/gpg.key</a>
```

\$ echo "deb [signed-by=/usr/share/keyrings/grafana.key] <a href="https://apt.grafana.com">https://apt.grafana.com</a> stable main" | sudo tee -a /etc/apt/sources.list.d/grafana.list

\$ echo "deb [signed-by=/usr/share/keyrings/grafana.key] <a href="https://apt.grafana.com">https://apt.grafana.com</a> beta main" | sudo tee -a /etc/apt/sources.list.d/grafana.list

```
ubuntu@ip-172-31-29-137:-/dashboard$ sudo apt-get install -y apt-transport-https
Reading package lists... Done
Building dependency tree
Reading state information... Done
apt-transport-https is already the newest version (2.0.9).
0 upgraded, 0 newly installed, 0 to remove and 30 not upgraded.
ubuntu@ip-172-31-29-137:-/dashboard$ sudo apt-get install -y software-properties-common wget
Reading package lists... Done
Building dependency tree
Reading state information... Done
software-properties-common is already the newest version (0.99.9.11).
wget is already the newest version (1.20.3-lubuntu2).
wget set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 30 not upgraded.
ubuntu@ip-172-31-29-137:-/dashboard$ sudo wget -q -0 /usr/share/keyrings/grafana.key https://apt.grafana.com/gpg
.key
ubuntu@ip-172-31-29-137:-/dashboard$ echo "deb [signed-by=/usr/share/keyrings/grafana.key] https://apt.grafana.c
om stable main" | sudo tee -a /etc/apt/sources.list.d/grafana.list
deb [signed-by=/usr/share/keyrings/grafana.key] https://apt.grafana.c
om beta main" | sudo tee -a /etc/apt/sources.list.d/grafana.list
deb [signed-by=/usr/share/keyrings/grafana.key] https://apt.grafana.c
om beta main" | sudo tee -a /etc/apt/sources.list.d/grafana.list
deb [signed-by=/usr/share/keyrings/grafana.key] https://apt.grafana.com beta main
ubuntu@ip-172-31-29-137:-/dashboard$ echo "deb [signed-by=/usr/share/keyrings/grafana.key] https://apt.grafana.c
deb [signed-by=/usr/share/keyrings/grafana.key] https://apt.grafana.com beta main
ubuntu@ip-172-31-29-137:-/dashboard$ | https://apt.grafana.com beta main
```

Updates the list of available packages

## \$ sudo apt-get update

```
ubuntu@ip-172-31-29-137:-/dashboard$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http:://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Hit:5 https://download.docker.com/linux/ubuntu focal InRelease
Ign:6 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:7 https://pkg.jenkins.io/debian-stable binary/ Release
Get:8 http:://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:9 https://apt.grafana.com stable InRelease [5984 B]
Get:10 https://apt.grafana.com beta InRelease [5976 B]
Hit:4 https://packages.cloud.google.com/apt kubernetes-xenial InRelease
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1085 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [259 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [25.2 kB]
Get:15 https://apt.grafana.com stable/main amd64 Packages [132 kB]
Get:16 https://apt.grafana.com beta/main amd64 Packages [162 B]
Get:17 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [2304 kB]
Get:18 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [857 kB]
Get:19 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [857 kB]
Get:20 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [18.7 kB]
Fetched 5222 kB in 3s (2012 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-29-137:-/dashboard$
```

## \$ sudo apt-get install grafana

```
ubuntu@ip-172-31-29-137:-/dashboard$ sudo apt-get install grafana
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
    grafana
0 upgraded, 1 newly installed, 0 to remove and 33 not upgraded.
Need to get 83.5 MB of archives.
After this operation, 306 MB of additional disk space will be used.
Get:1 https://apt.grafana.com stable/main amd64 grafana amd64 10.0.2 [83.5 MB]
Fetched 83.5 MB in 2s (49.7 MB/s)
Selecting previously unselected package grafana.
(Reading database ... 110183 files and directories currently installed.)
Preparing to unpack .../grafana_10.0.2_amd64.deb ...
Unpacking grafana (10.0.2) ...
Setting up grafana (10.0.2) ...
Adding new user `grafana' (UID 115) with group `grafana' ...
Not creating home directory `/usr/share/grafana'.
### NOT starting on installation, please execute the following statements to configure grafana to start automatically using systemd
sudo /bin/systemctl daemon-reload
sudo /bin/systemctl daemon-reload
sudo /bin/systemctl enable grafana-server
### You can start grafana-server by executing
sudo /bin/systemctl start grafana-server
Processing triggers for systemd (245.4-4ubuntu3.21) ...
ubuntu@ip-172-31-29-137:-/dashboard$
```

# Install Prometheus \$ sudo apt-get install -y prometheus

```
ubuntu@ip-172-31-29-137:-$ sudo apt-get install -y prometheus
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
fonts-glyphicons-halflings javascript-common libc-ares2 libio-pty-perl libipc-run-perl libjs-bootstrap
libjs-bootstrap4 libjs-d3 libjs-eonasdan-bootstrap-datetimepicker libjs-jquery libjs-jquery-hotkeys
libjs-moment-libjs-moment-timezone libjs-mustache libjs-popper.js libjs-rickshaw libnode64
libtime-duration-perl libtimedate-perl moreutils node-jquery nodejs nodejs-doc prometheus-node-exporter
prometheus-node-exporter-collectors smartmontools
Suggested packages:
apache2 | lightpd | httpd npm gsmartcontrol smart-notifier mailx | mailutils
The following NEW packages will be installed:
fonts-glyphicons-halflings javascript-common libc-ares2 libio-pty-perl libipc-run-perl libjs-bootstrap
libjs-bootstrap4 libjs-d3 libjs-d3 libjs-conasdan-bootstrap-datetimepicker libjs-jquery libjs-jquery-hotkeys
libjs-moment libjs-moment-timezone libjs-mustache libjs-popper.js libjs-rickshaw libnode64
libtime-duration-perl libtimedate-perl moreutils node-jquery nodejs nodejs-doc prometheus
prometheus-node-exporter prometheus-node-exporter-collectors smartmontools
9 upgraded, 27 newly installed, 0 to remove and 33 not upgraded.
Need to get 31.2 MB of archives.
After this operation, 261 MB of additional disk space will be used.
Get:1 http://us-east-l.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 libjs-jquery-hotkeys all 0-20130707+git
zd51s2a9+dfsg-zbuntu1 [11.4 kB]
Get:3 http://us-east-l.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 libjs-popper.js all 1.16.0+ds2-1 [52.5
kB]
Get:3 http://us-east-l.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 libjs-bootstrap4 all 4.4.1+dfsg-1 [12
kB]
Get:5 http://us-east-l.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 libjs-bootstrap4 all 3.4.1+dfsg-1 [24
kB]
Get:6 http://us-east-l.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 libjs-moment-timezone all 0.5.28+dfsg
Get:9 http
```