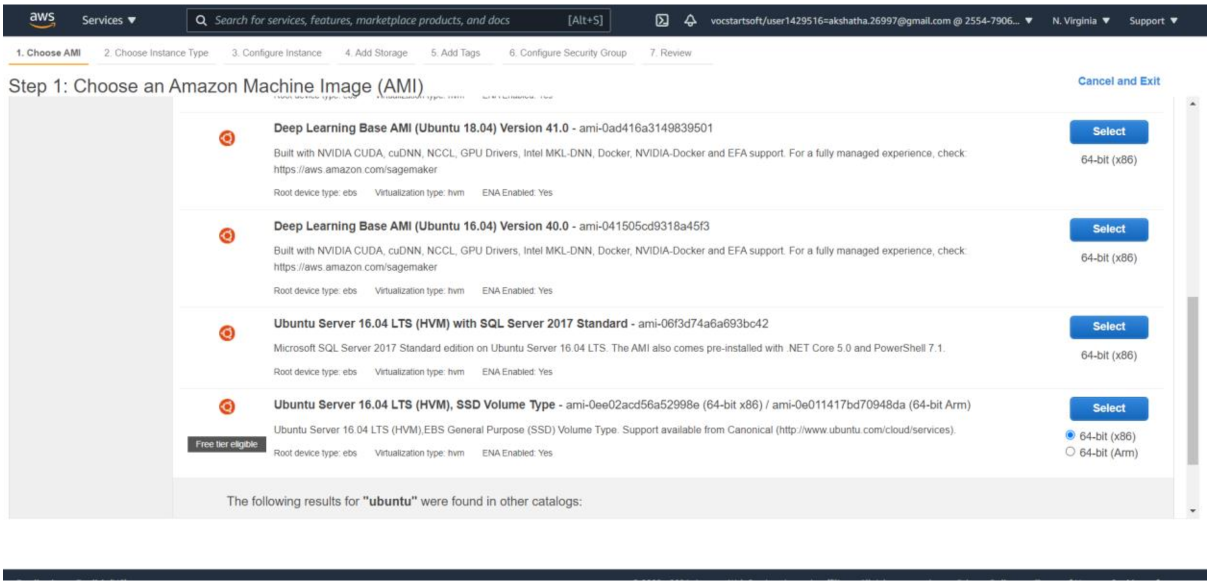
Mid Project: Create Jenkins with one master and 3 nodes deploy Manipal Prolearn application in all three nodes using staging.

- Create Jenkins Master node

1. Create Jenkins master node using UbuntuServer 16.04 AMI.



Step 1: Choose an Amazon Machine Image (AMI)

Deep Learning Base AMI (Ubuntu 18.04) Version 41.0 - ami-0ad416a3149839501
Built with NVIDIA CUDA, cuDNN, NCCL, GPU Drivers, Intel MKL-DNN, Docker, NVIDIA-Docker and EFA support. For a fully managed experience, check: https://aws.amazon.com/sagemaker
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes
64-bit (x86)

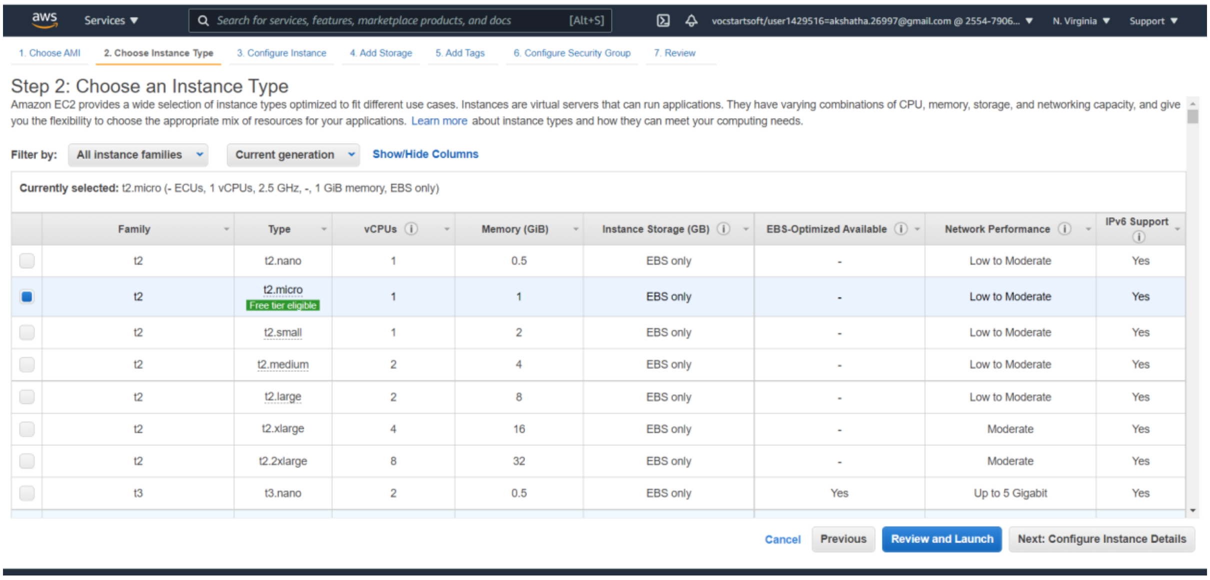
Deep Learning Base AMI (Ubuntu 16.04) Version 40.0 - ami-041505cd9318a45f3
Built with NVIDIA CUDA, cuDNN, NCCL, GPU Drivers, Intel MKL-DNN, Docker, NVIDIA-Docker and EFA support. For a fully managed experience, check: https://aws.amazon.com/sagemaker
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes
64-bit (x86)

Ubuntu Server 16.04 LTS (HVM) with SQL Server 2017 Standard - ami-06f3d74a6a693bc42
Microsoft SQL Server 2017 Standard edition on Ubuntu Server 16.04 LTS. The AMI also comes pre-installed with .NET Core 5.0 and PowerShell 7.1.
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes
64-bit (x86)

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-0ee02acd56a52998e (64-bit x86) / ami-0e011417bd70948da (64-bit Arm)
Ubuntu Server 16.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes
● 64-bit (x86)
○ 64-bit (Arm)

The following results for **"ubuntu"** were found in other catalogs:

2. Select instance type as t2.micro


aws
Services ▼
Search for services, features, marketplace products, and docs [Alt+S]
vocstartsoft/user1429516=akshatha.26997@gmail.com @ 2554-7906... ▼
N. Virginia ▼
Support ▼
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Cancel
Previous
Review and Launch
Next: Configure Instance Details

Step 2: Choose an Instance Type

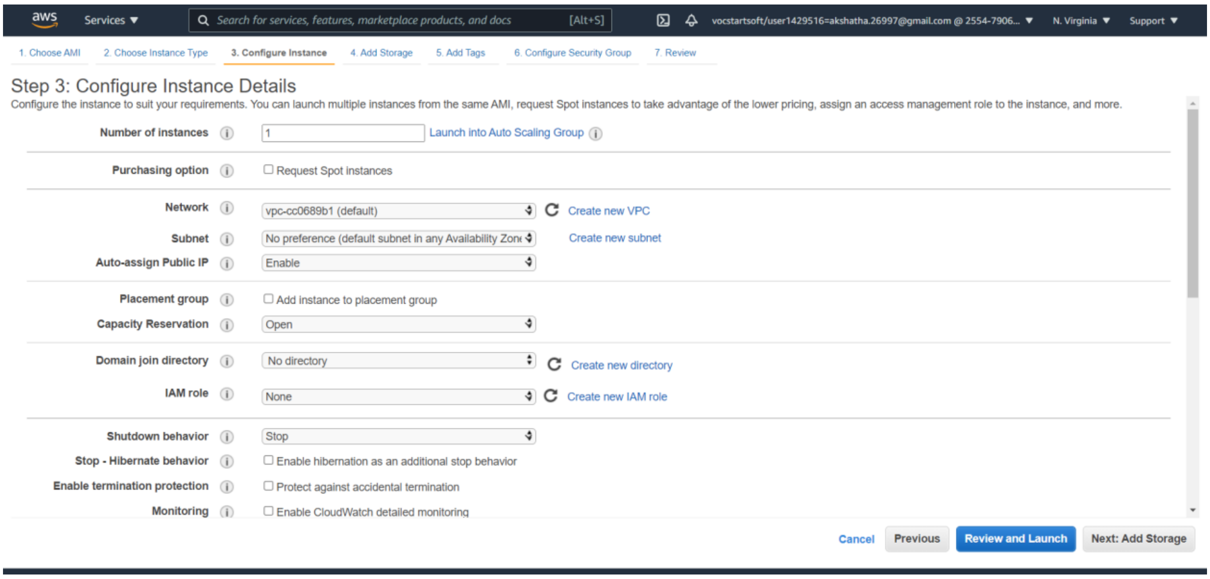
Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

Filter by: All instance families | Current generation | Show/Hide Columns

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
□	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
■	t2	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
□	t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes
□	t2	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
□	t2	t2.large	2	8	EBS only	-	Low to Moderate	Yes
□	t2	t2.xlarge	4	16	EBS only	-	Moderate	Yes
□	t2	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
□	t3	t3.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes

3. Enable public IP and select appropriate VPC and subnet.

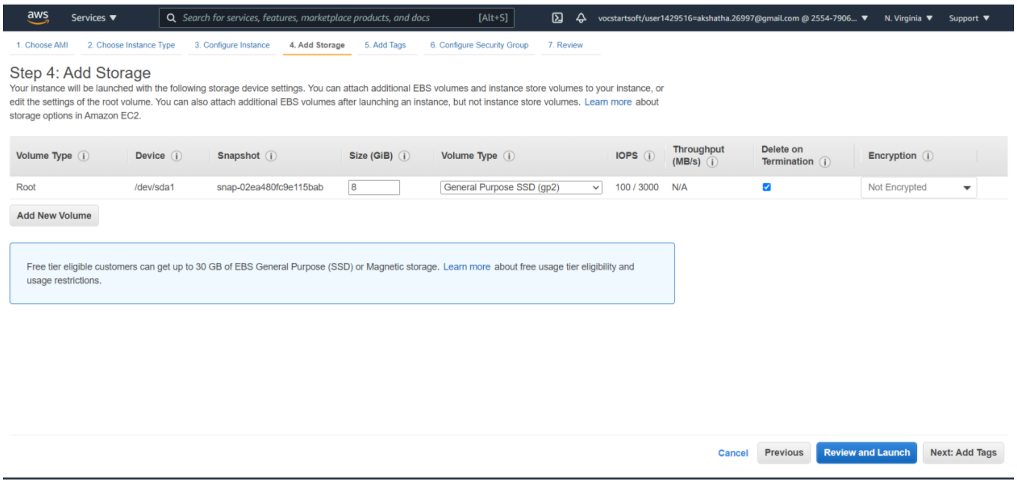


Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances	1	Launch into Auto Scaling Group
Purchasing option	□ Request Spot instances	
Network	vpc-cc0689b1 (default)	Create new VPC
Subnet	No preference (default subnet in any Availability Zon	Create new subnet
Auto-assign Public IP	Enable	
Placement group	□ Add instance to placement group	
Capacity Reservation	Open	
Domain join directory	No directory	Create new directory
IAM role	None	Create new IAM role
Shutdown behavior	Stop	
Stop - Hibernate behavior	□ Enable hibernation as an additional stop behavior	
Enable termination protection	□ Protect against accidental termination	
Monitoring	□ Enable CloudWatch detailed monitoring	

4. Let the storage be default as 8GB.



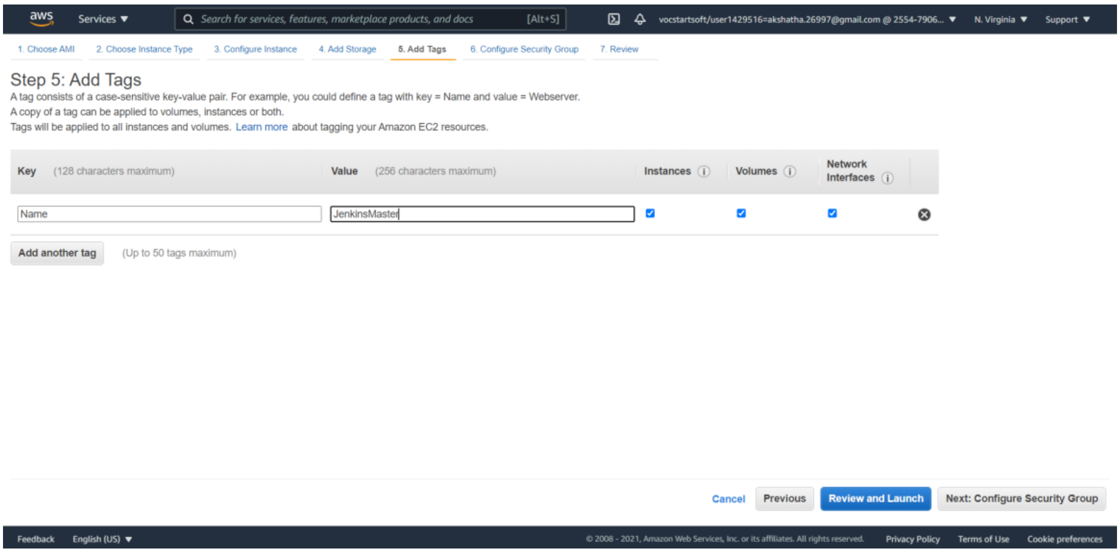
Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/sda1	snap-02ea480fc9e115bab	8	General Purpose SSD (gp2)	100 / 3000	N/A	☑	Not Encrypted

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. Learn more about free usage tier eligibility and usage restrictions.

5. Give name tag as ‘JenkinsMaster’.


aws
Services ▼
Search for services, features, marketplace products, and docs [Alt+S]
vocstartsoft/user1429516=akshatha.26997@gmail.com @ 2554-7906... ▼
N. Virginia ▼
Support ▼
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Add another tag
Cancel
Previous
Review and Launch
Next: Configure Security Group
Feedback
English (US) ▼
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Cookie preferences

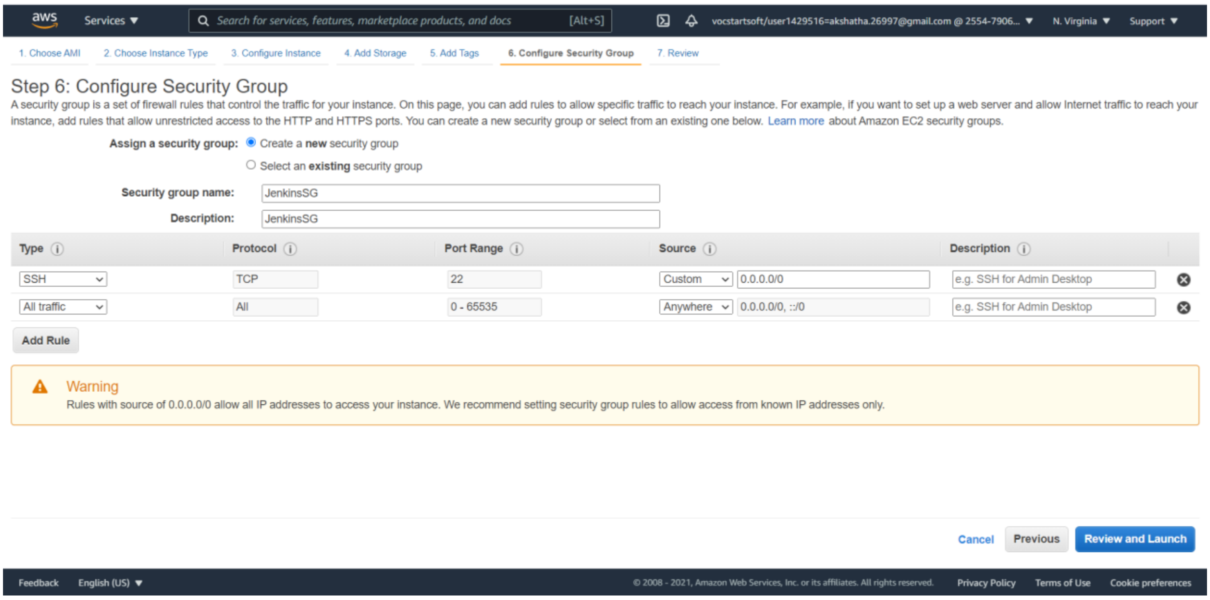
Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.
A copy of a tag can be applied to volumes, instances or both.
Tags will be applied to all instances and volumes. Learn more about tagging your Amazon EC2 resources.

Key (128 characters maximum)	Value (256 characters maximum)	Instances	Volumes	Network Interfaces
Name	JenkinsMaster	☑	☑	☑

(Up to 50 tags maximum)

6. Create a new SecurityGroup with all traffic allowed.


aws
Services ▼
Search for services, features, marketplace products, and docs [Alt+S]
vocstartsoft/user1429516=akshatha.26997@gmail.com @ 2554-7906... ▼
N. Virginia ▼
Support ▼
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Add Rule
Cancel
Previous
Review and Launch
Feedback
English (US) ▼
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Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. Learn more about Amazon EC2 security groups.

Assign a security group: ● Create a **new** security group
○ Select an **existing** security group

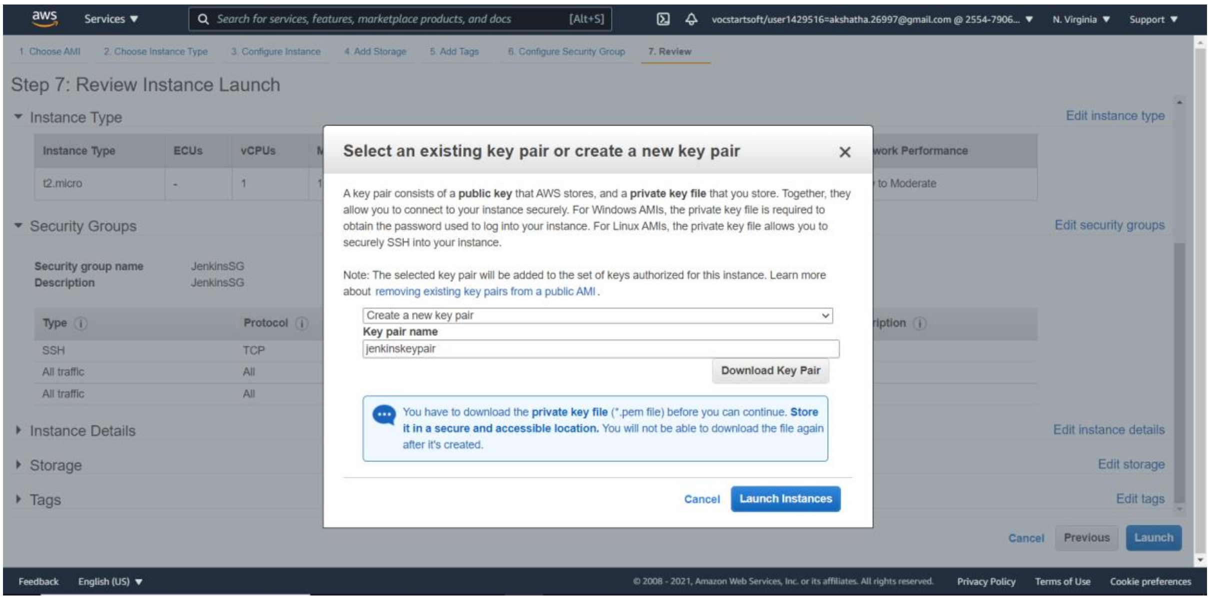
Security group name: JenkinsSG

Description: JenkinsSG

Type	Protocol	Port Range	Source		Description
SSH	TCP	22	Custom	0.0.0.0/0	e.g. SSH for Admin Desktop
All traffic	All	0 - 65535	Anywhere	0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop

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

7. Launch the instance by creating a keypair for the instance.



Step 7: Review Instance Launch

Instance Type

Instance Type	ECUs	vCPUs	M	work Performance
t2.micro	-	1	1	to Moderate

Security Groups

Security group name JenkinsSG
Description JenkinsSG

Type	Protocol	ription
SSH	TCP	
All traffic	All	
All traffic	All	

Instance Details

Storage

Tags

Select an existing key pair or create a new key pair ×

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about removing existing key pairs from a public AMI .

Create a new key pair

Key pair name: jenkinskeypair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

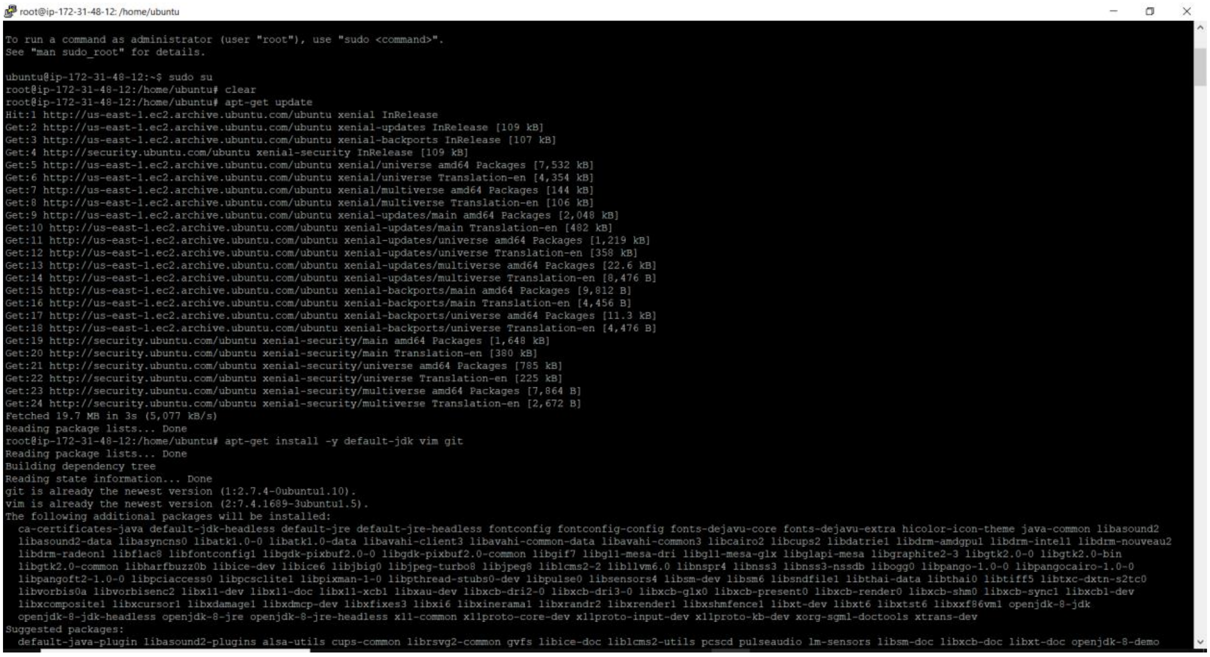
8. After the instance is launched and successfully running , SSH into the instance and execute the following commands:

sudo su

cd /home/ubuntu

apt-get update

apt-get install -y default-jdk vim git

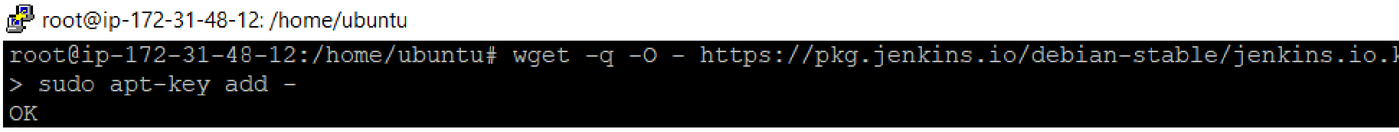


root@ip-172-31-48-12: /home/ubuntu

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-48-12:~$ sudo su
root@ip-172-31-48-12:/home/ubuntu# clear
root@ip-172-31-48-12:/home/ubuntu# apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-backports InRelease [107 kB]
Get:4 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial/universe amd64 Packages [7,532 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial/universe Translation-en [4,354 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial/multiverse amd64 Packages [144 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial/multiverse Translation-en [106 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/main amd64 Packages [2,048 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/main Translation-en [482 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/universe amd64 Packages [1,219 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/universe Translation-en [358 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 Packages [22.6 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/multiverse Translation-en [8,476 B]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-backports/main amd64 Packages [9,812 B]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-backports/main Translation-en [4,456 B]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-backports/universe amd64 Packages [11.3 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-backports/universe Translation-en [4,476 B]
Get:19 http://security.ubuntu.com/ubuntu xenial-security/main amd64 Packages [1,648 kB]
Get:20 http://security.ubuntu.com/ubuntu xenial-security/main Translation-en [380 kB]
Get:21 http://security.ubuntu.com/ubuntu xenial-security/universe amd64 Packages [785 kB]
Get:22 http://security.ubuntu.com/ubuntu xenial-security/universe Translation-en [225 kB]
Get:23 http://security.ubuntu.com/ubuntu xenial-security/multiverse amd64 Packages [7,864 B]
Get:24 http://security.ubuntu.com/ubuntu xenial-security/multiverse Translation-en [2,672 B]
Fetched 19.7 MB in 3s (5,077 kB/s)
Reading package lists... Done
root@ip-172-31-48-12:/home/ubuntu# apt-get install -y default-jdk vim git
Reading package lists... Done
Building dependency tree
Reading state information... Done
git is already the newest version (1:2.7.4-0ubuntu1.10).
vim is already the newest version (2:7.4.1689-3ubuntu1.5).
The following additional packages will be installed:
  ca-certificates-java default-jdk-headless default-jre default-jre-headless fontconfig fontconfig-config fonts-dejavu-core fonts-dejavu-extra hicolor-icon-theme java-common libasound2
  libasound2-data libasyncns0 libatk1.0-0 libatk1.0-data libavahi-client3 libavahi-common-data libavahi-common3 libcairo2 libcups2 libdatrie1 libdrm-amdgpu1 libdrm-intel1 libdrm-nouveau2
  libdrm-radeon1 libflac8 libfontconfig1 libgdk-pixbuf2.0-0 libgdk-pixbuf2.0-common libgif7 libgl1-mesa-dri libgl1-mesa-glx libglapi-mesa libgraphite2-3 libgtk2.0-0 libgtk2.0-bin
  libgtk2.0-common libharfbuzz0b libice-dev libice6 libjbig0 libjpeg-turbo8 libjpeg8 liblcms2-2 libllvm6.0 libnspr4 libnss3 libnss3-nssdb libogg0 libpango-1.0-0 libpangocairo-1.0-0
  libpangoft2-1.0-0 libpciaccess0 libpcsclite1 libpixman-1-0 libpthread-stubs0-dev libpulse0 libsensors4 libsm-dev libsm6 libsndfile1 libthai-data libthai0 libtiff5 libtxc-dxtn-s2tc0
  libvorbis0a libvorbisenc2 libx11-dev libx11-doc libx11-xcb1 libxau-dev libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-render0 libxcb-shm0 libxcb-sync1 libxcb1-dev
  libxcomposite1 libxcursor1 libxdamage1 libxdmcp-dev libxfixes3 libxi6 libxinerama1 libxrandr2 libxrender1 libxshmfence1 libxt-dev libxt6 libxtst6 libxxf86vm1 openjdk-8-jdk
  openjdk-8-jdk-headless openjdk-8-jre openjdk-8-jre-headless x11-common x11proto-core-dev x11proto-input-dev x11proto-kb-dev xorg-sgml-doctools xtrans-dev
Suggested packages:
  default-java-plugin libasound2-plugins alsa-utils cups-common librsvg2-common gvfs libice-doc liblcms2-utils pcscd pulseaudio lm-sensors libsm-doc libxcb-doc libxt-doc openjdk-8-demo
```

9. Add the key

wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo apt-key add –



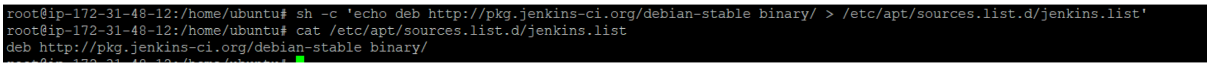
root@ip-172-31-48-12: /home/ubuntu

```
root@ip-172-31-48-12:/home/ubuntu# wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.k
> sudo apt-key add -
OK
```

10. Create source list and validate it.

sh -c 'echo deb http://pkg.jenkins-ci.org/debian-stable binary/ > /etc/apt/sources.list.d/jenkins.list'

cat /etc/apt/sources.list.d/jenkins.list

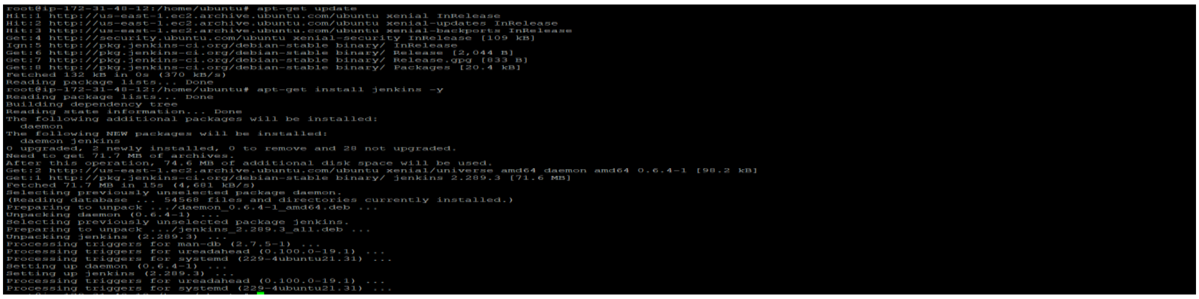


```
root@ip-172-31-48-12:/home/ubuntu# sh -c 'echo deb http://pkg.jenkins-ci.org/debian-stable binary/ > /etc/apt/sources.list.d/jenkins.list'
root@ip-172-31-48-12:/home/ubuntu# cat /etc/apt/sources.list.d/jenkins.list
deb http://pkg.jenkins-ci.org/debian-stable binary/
```

11.Update the repository and install Jenkins.

apt-get update

apt-get install jenkins -y

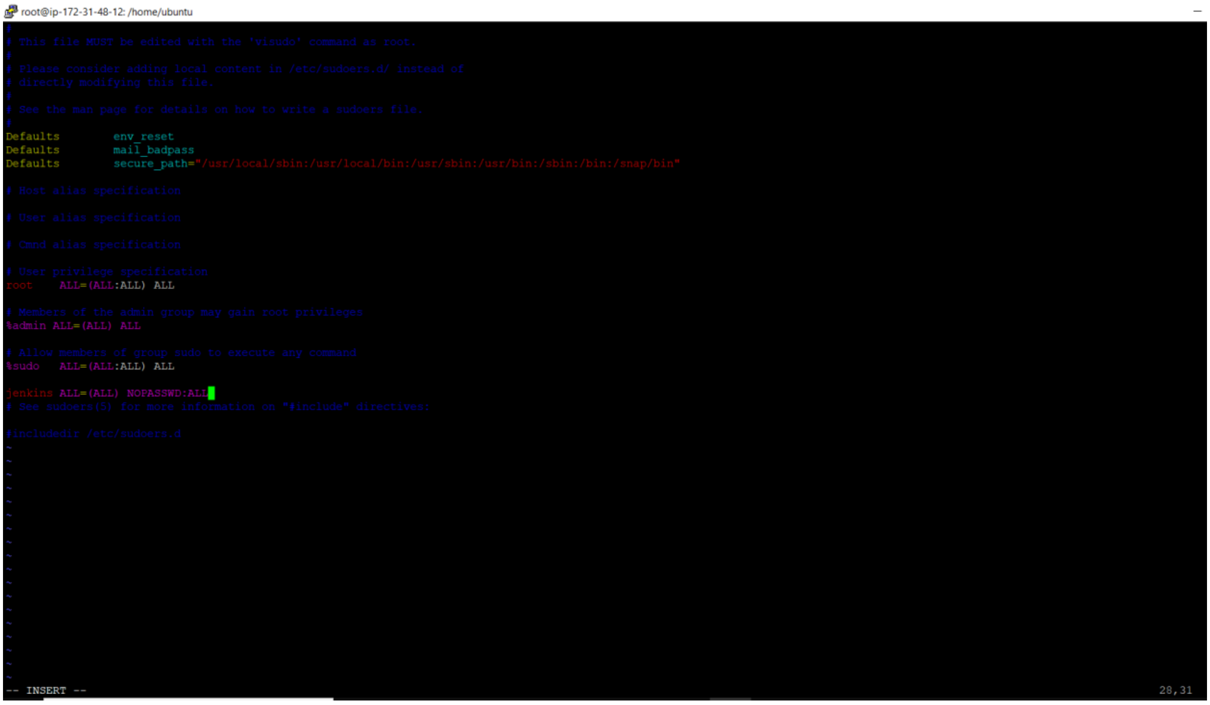


```
root@ip-172-31-48-12:/home/ubuntu# apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 kB]
Ign:5 http://pkg.jenkins-ci.org/debian-stable binary/ InRelease
Get:6 http://pkg.jenkins-ci.org/debian-stable binary/ Release [2,044 B]
Get:7 http://pkg.jenkins-ci.org/debian-stable binary/ Release.gpg [833 B]
Get:8 http://pkg.jenkins-ci.org/debian-stable binary/ Packages [20.4 kB]
Fetched 132 kB in 0s (370 kB/s)
Reading package lists... Done
root@ip-172-31-48-12:/home/ubuntu# apt-get install jenkins -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  daemon
The following NEW packages will be installed:
  daemon jenkins
0 upgraded, 2 newly installed, 0 to remove and 28 not upgraded.
Need to get 71.7 MB of archives.
After this operation, 74.6 MB of additional disk space will be used.
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu xenial/universe amd64 daemon amd64 0.6.4-1 [98.2 kB]
Get:1 http://pkg.jenkins-ci.org/debian-stable binary/ jenkins 2.289.3 [71.6 MB]
Fetched 71.7 MB in 15s (4,681 kB/s)
Selecting previously unselected package daemon.
(Reading database ... 54568 files and directories currently installed.)
Preparing to unpack .../daemon_0.6.4-1_amd64.deb ...
Unpacking daemon (0.6.4-1) ...
Selecting previously unselected package jenkins.
Preparing to unpack .../jenkins_2.289.3_all.deb ...
Unpacking jenkins (2.289.3) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for ureadahead (0.100.0-19.1) ...
Processing triggers for systemd (229-4ubuntu21.31) ...
Setting up daemon (0.6.4-1) ...
Setting up jenkins (2.289.3) ...
Processing triggers for ureadahead (0.100.0-19.1) ...
Processing triggers for systemd (229-4ubuntu21.31) ...
```

12. Add the Jenkins user /etc/sudoers file and add the line to the file and save it.

vim /etc/sudoers

jenkins ALL=(ALL) NOPASSWD:ALL



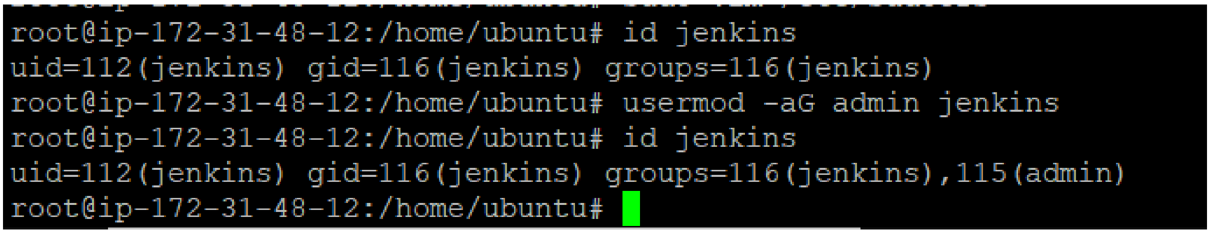
```
root@ip-172-31-48-12: /home/ubuntu
#
# This file MUST be edited with the 'visudo' command as root.
#
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults        env_reset
Defaults        mail_badpass
Defaults        secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin"

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL

# Members of the admin group may gain root privileges
%admin ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

jenkins ALL=(ALL) NOPASSWD:ALL
# See sudoers(5) for more information on "#include" directives:

#includedir /etc/sudoers.d
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
-- INSERT --                                                                                    28,31
```

13.Add the Jenkins user to admin group

id jenkins

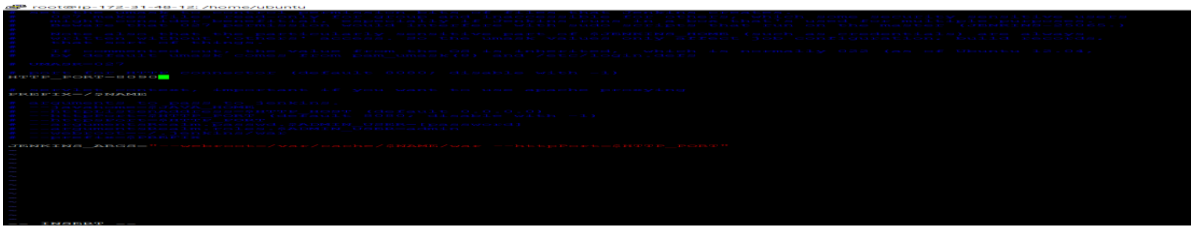
usermod -aG admin jenkins

id Jenkins



```
root@ip-172-31-48-12:/home/ubuntu# id jenkins
uid=112(jenkins) gid=116(jenkins) groups=116(jenkins)
root@ip-172-31-48-12:/home/ubuntu# usermod -aG admin jenkins
root@ip-172-31-48-12:/home/ubuntu# id jenkins
uid=112(jenkins) gid=116(jenkins) groups=116(jenkins),115(admin)
root@ip-172-31-48-12:/home/ubuntu#
```

14.Change the default port number from 8080 to 8090 by editing the file */etc/default/Jenkins.*

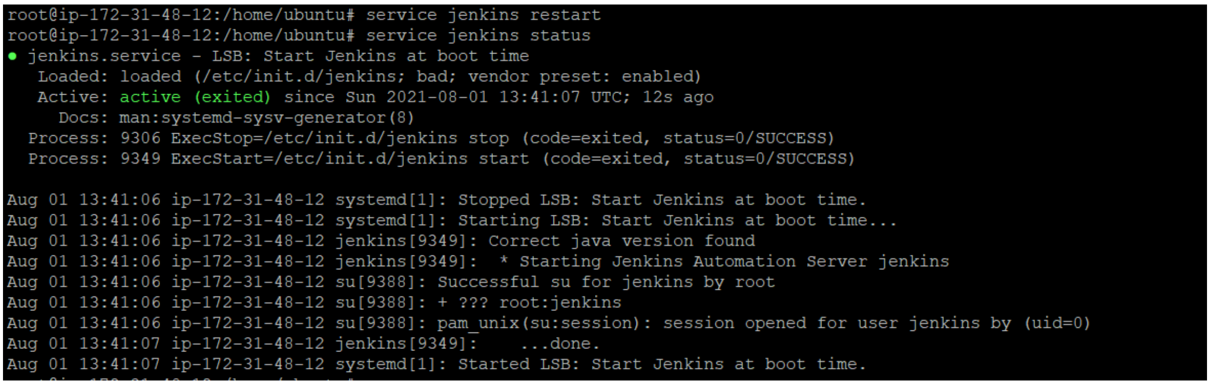


```
root@ip-172-31-48-12: /home/ubuntu
HTTP_PORT=8090

PREFIX=/$NAME

JENKINS_ARGS="--webroot=/var/cache/$NAME/war --httpPort=$HTTP_PORT"

-- INSERT --
```

15. Restart the Jenkins server and check the status.

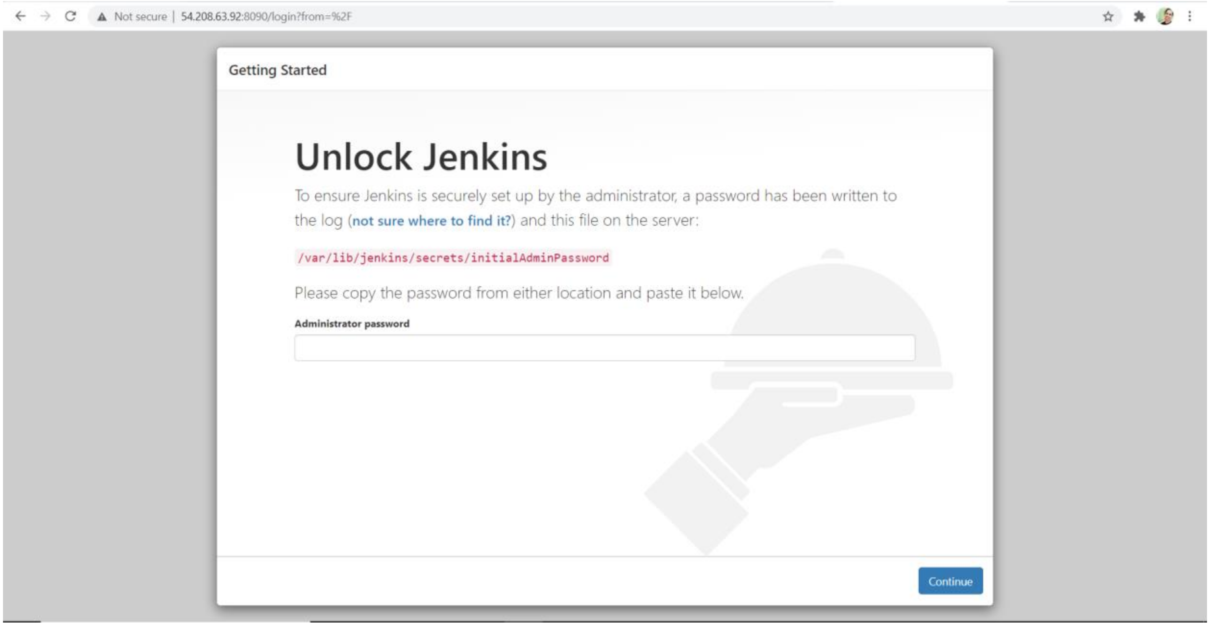
service jenkins restart

service jenkins status



```
root@ip-172-31-48-12:/home/ubuntu# service jenkins restart
root@ip-172-31-48-12:/home/ubuntu# service jenkins status
● jenkins.service - LSB: Start Jenkins at boot time
   Loaded: loaded (/etc/init.d/jenkins; bad; vendor preset: enabled)
   Active: active (exited) since Sun 2021-08-01 13:41:07 UTC; 12s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 9306 ExecStop=/etc/init.d/jenkins stop (code=exited, status=0/SUCCESS)
  Process: 9349 ExecStart=/etc/init.d/jenkins start (code=exited, status=0/SUCCESS)

Aug 01 13:41:06 ip-172-31-48-12 systemd[1]: Stopped LSB: Start Jenkins at boot time.
Aug 01 13:41:06 ip-172-31-48-12 systemd[1]: Starting LSB: Start Jenkins at boot time...
Aug 01 13:41:06 ip-172-31-48-12 jenkins[9349]: Correct java version found
Aug 01 13:41:06 ip-172-31-48-12 jenkins[9349]:  * Starting Jenkins Automation Server jenkins
Aug 01 13:41:06 ip-172-31-48-12 su[9388]: Successful su for jenkins by root
Aug 01 13:41:06 ip-172-31-48-12 su[9388]: + ??? root:jenkins
Aug 01 13:41:06 ip-172-31-48-12 su[9388]: pam_unix(su:session): session opened for user jenkins by (uid=0)
Aug 01 13:41:07 ip-172-31-48-12 jenkins[9349]:    ...done.
Aug 01 13:41:07 ip-172-31-48-12 systemd[1]: Started LSB: Start Jenkins at boot time.
```

16. Visit your Jenkins server at http://Server-IP-Address:8090/ on the web browser.



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:

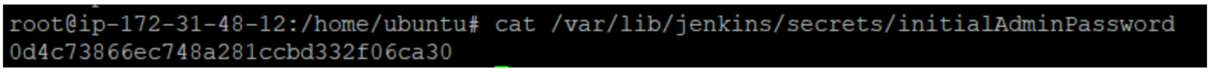
/var/lib/jenkins/secrets/initialAdminPassword

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

Administrator password

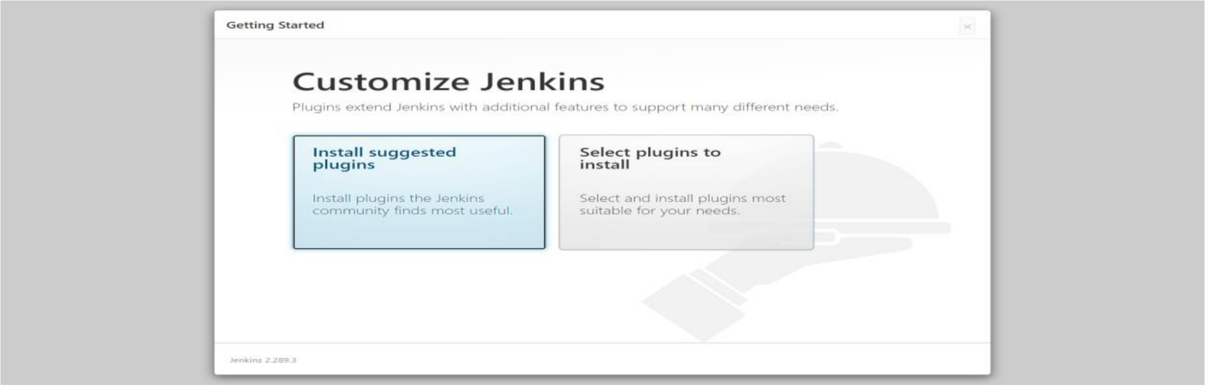
17. The administrator password can be obtained by executing the following command in the master node.

cat /var/lib/jenkins/secrets/initialAdminPassword



```
root@ip-172-31-48-12:/home/ubuntu# cat /var/lib/jenkins/secrets/initialAdminPassword
0d4c73866ec748a281ccbd332f06ca30
```

18.Click on Install suggested plugins.



Getting Started

Customize Jenkins

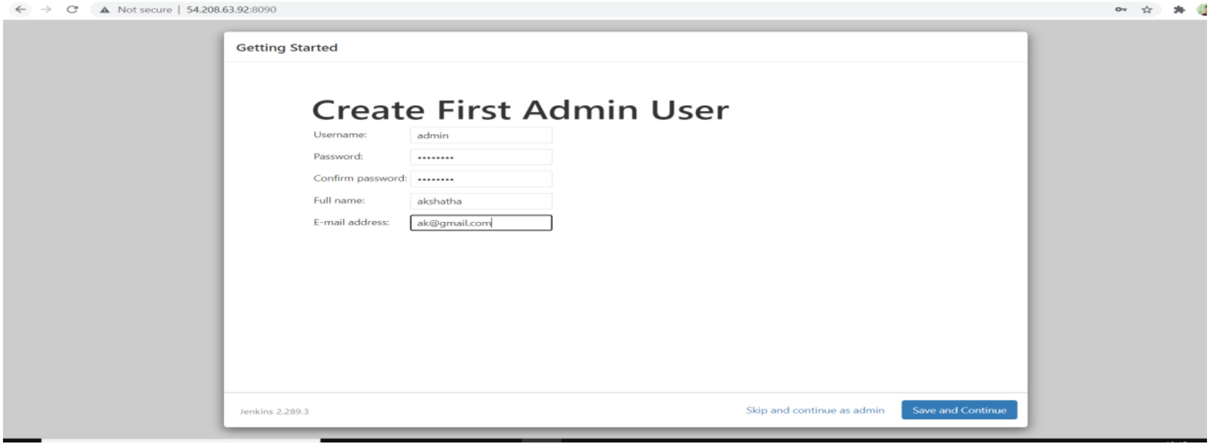
Plugins extend Jenkins with additional features to support many different needs.

Install suggested plugins
Install plugins the Jenkins community finds most useful.

Select plugins to install
Select and install plugins most suitable for your needs.

Jenkins 2.289.3

19.Create an admin user by setting username and password.



Not secure | 54.208.63.92:8090

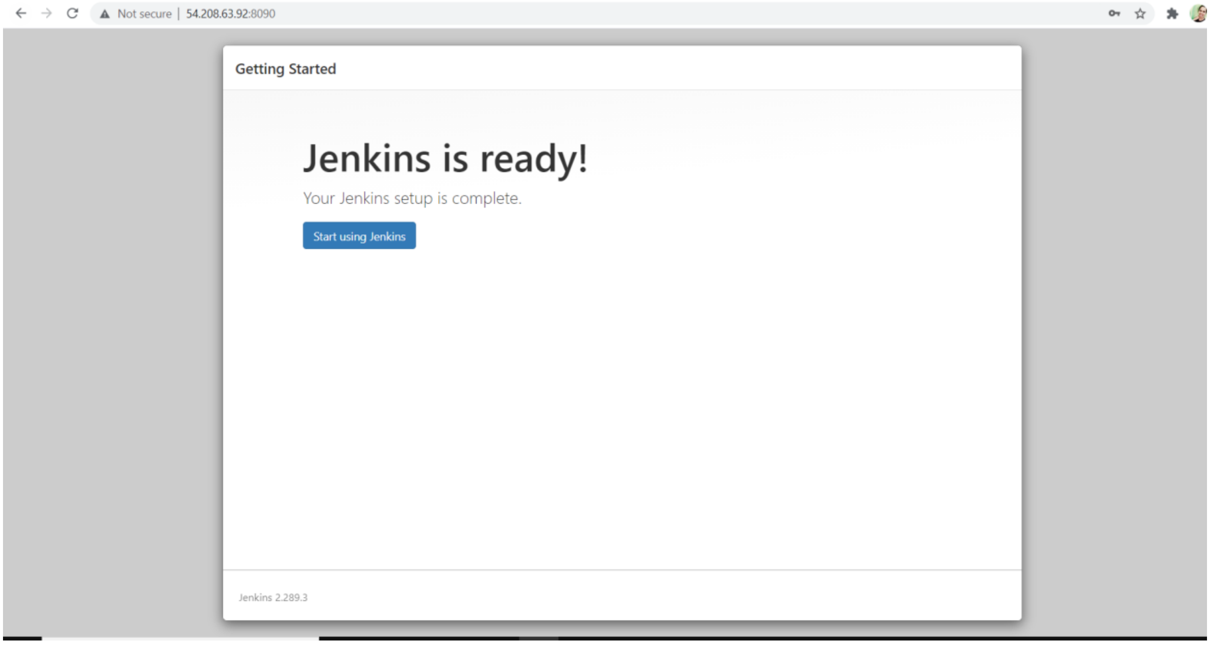
Getting Started

Create First Admin User

Username:	admin
Password:	••••••••
Confirm password:	••••••••
Full name:	akshatha
E-mail address:	ak@gmail.com

Jenkins 2.289.3

20. Jenkins master node is configured successfully.



Not secure | 54.208.63.92:8090

Getting Started

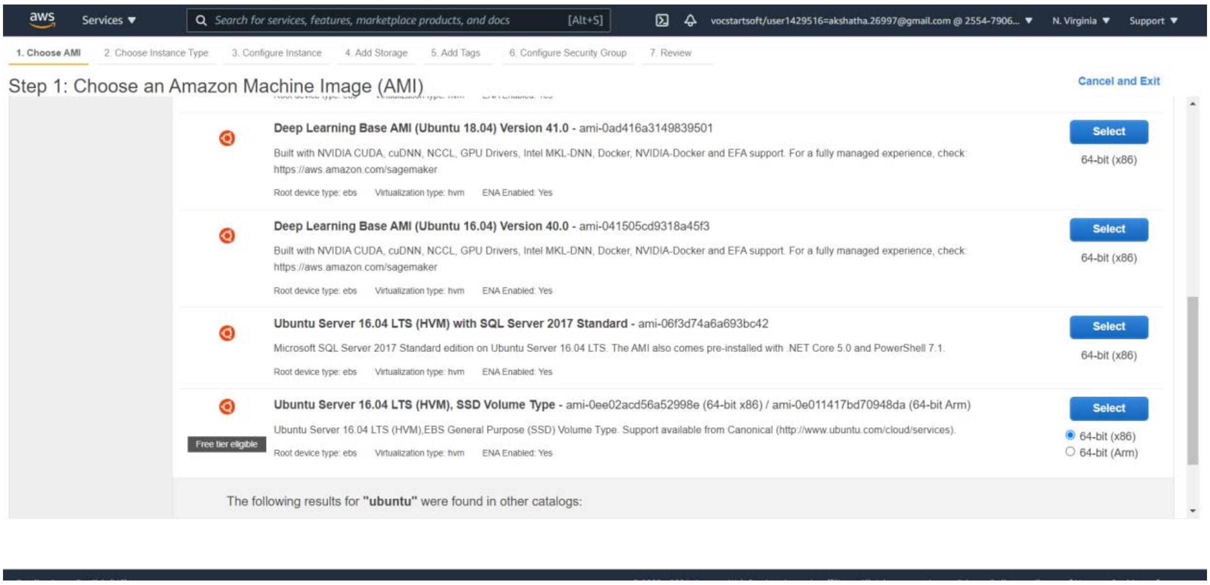
Jenkins is ready!

Your Jenkins setup is complete.

Jenkins 2.289.3

- Create 3 Jenkins slave nodes.

1. Create Jenkins slavenode using UbuntuServer 16.04 AMI



Step 1: Choose an Amazon Machine Image (AMI)

Deep Learning Base AMI (Ubuntu 18.04) Version 41.0 - ami-0ad416a3149839501
Built with NVIDIA CUDA, cuDNN, NCCL, GPU Drivers, Intel MKL-DNN, Docker, NVIDIA-Docker and EFA support. For a fully managed experience, check: https://aws.amazon.com/sagemaker
Root device type: ebs   Virtualization type: hvm   ENA Enabled: Yes
64-bit (x86)

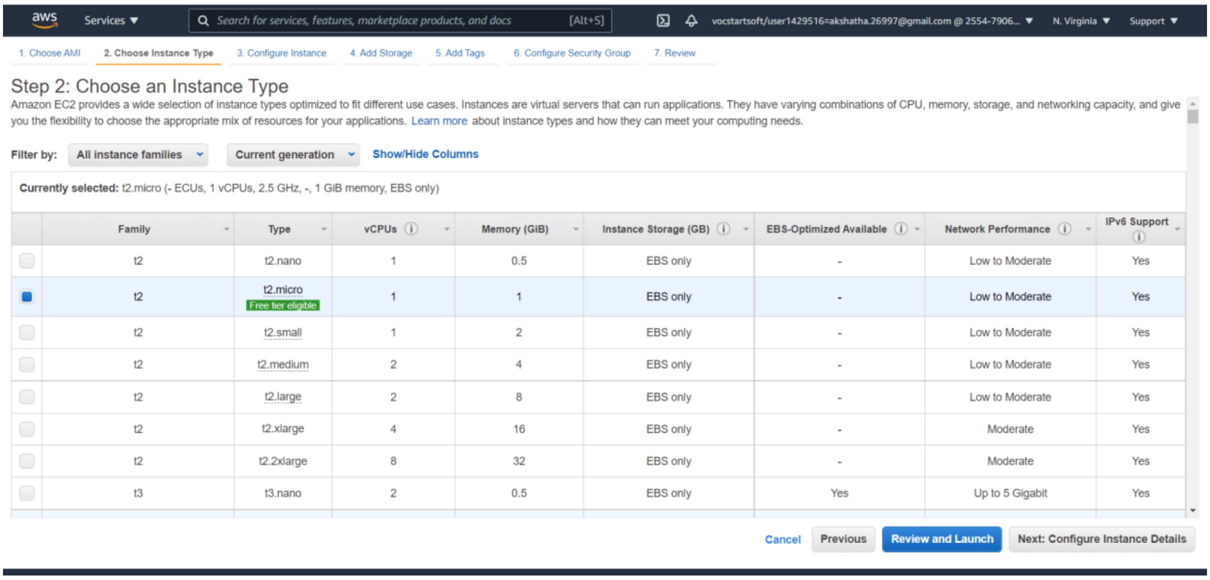
Deep Learning Base AMI (Ubuntu 16.04) Version 40.0 - ami-041505cd9318a45f3
Built with NVIDIA CUDA, cuDNN, NCCL, GPU Drivers, Intel MKL-DNN, Docker, NVIDIA-Docker and EFA support. For a fully managed experience, check: https://aws.amazon.com/sagemaker
Root device type: ebs   Virtualization type: hvm   ENA Enabled: Yes
64-bit (x86)

Ubuntu Server 16.04 LTS (HVM) with SQL Server 2017 Standard - ami-06f3d74a6a693bc42
Microsoft SQL Server 2017 Standard edition on Ubuntu Server 16.04 LTS. The AMI also comes pre-installed with .NET Core 5.0 and PowerShell 7.1.
Root device type: ebs   Virtualization type: hvm   ENA Enabled: Yes
64-bit (x86)

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-0ee02acd56a52998e (64-bit x86) / ami-0e011417bd70948da (64-bit Arm)
Ubuntu Server 16.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Root device type: ebs   Virtualization type: hvm   ENA Enabled: Yes
● 64-bit (x86)
○ 64-bit (Arm)

The following results for **"ubuntu"** were found in other catalogs:

2. Select t2.micro as instance type.



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N. Virginia ▼
Support ▼
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Cancel
Previous
Review and Launch
Next: Configure Instance Details

Step 2: Choose an Instance Type

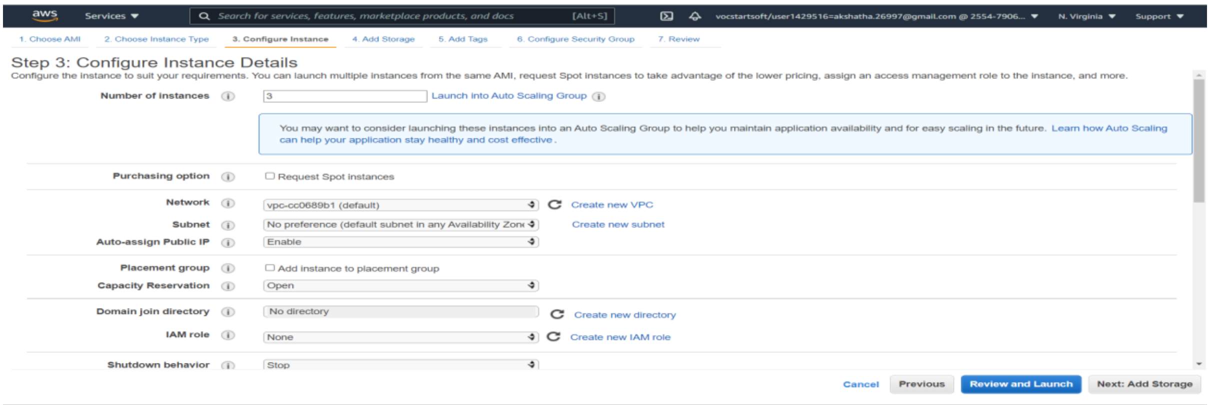
Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

Filter by: All instance families | Current generation | Show/Hide Columns

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
□	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
■	t2	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
□	t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes
□	t2	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
□	t2	t2.large	2	8	EBS only	-	Low to Moderate	Yes
□	t2	t2.xlarge	4	16	EBS only	-	Moderate	Yes
□	t2	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
□	t3	t3.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes

3. Let number of instances be 3 and enable public IP assignment .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1. Choose AMI
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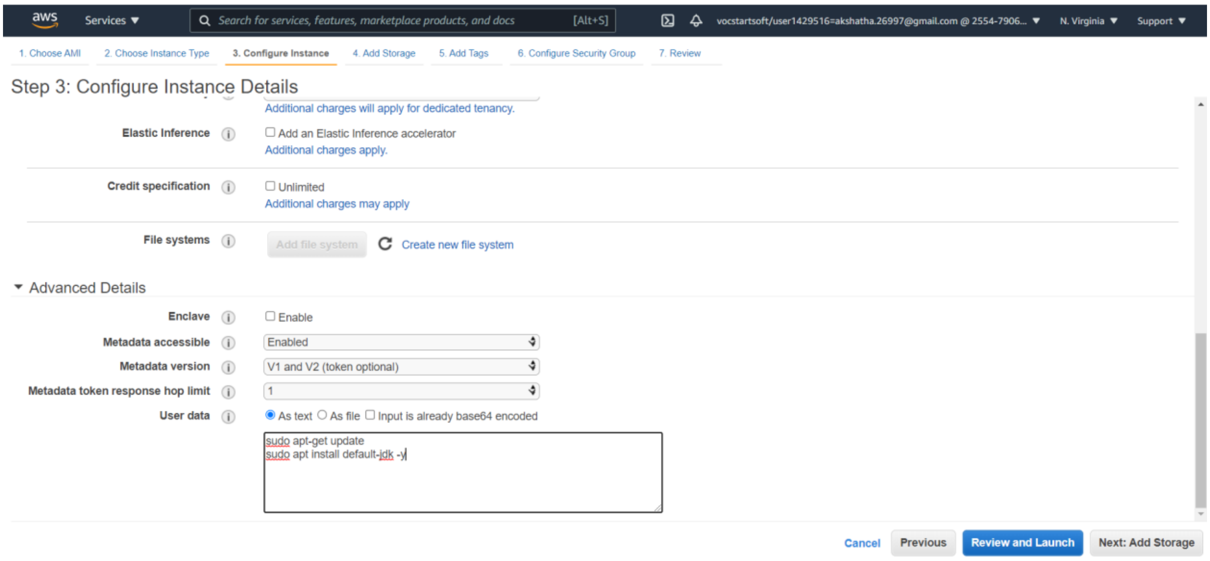
5. Add Tags
6. Configure Security Group
7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances	3 Launch into Auto Scaling Group
	You may want to consider launching these instances into an Auto Scaling Group to help you maintain application availability and for easy scaling in the future. Learn how Auto Scaling can help your application stay healthy and cost effective .
Purchasing option	□ Request Spot instances
Network	vpc-cc0689b1 (default) Create new VPC
Subnet	No preference (default subnet in any Availability Zone Create new subnet
Auto-assign Public IP	Enable
Placement group	□ Add instance to placement group
Capacity Reservation	Open
Domain join directory	No directory Create new directory
IAM role	None Create new IAM role
Shutdown behavior	Stop

4. Place the following script In userdata ,
   sudo apt-get update
   sudo apt install default-jdk -y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1. Choose AMI
2. Choose Instance Type
3. Configure Instance
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6. Configure Security Group
7. Review

Step 3: Configure Instance Details

Additional charges will apply for dedicated tenancy.

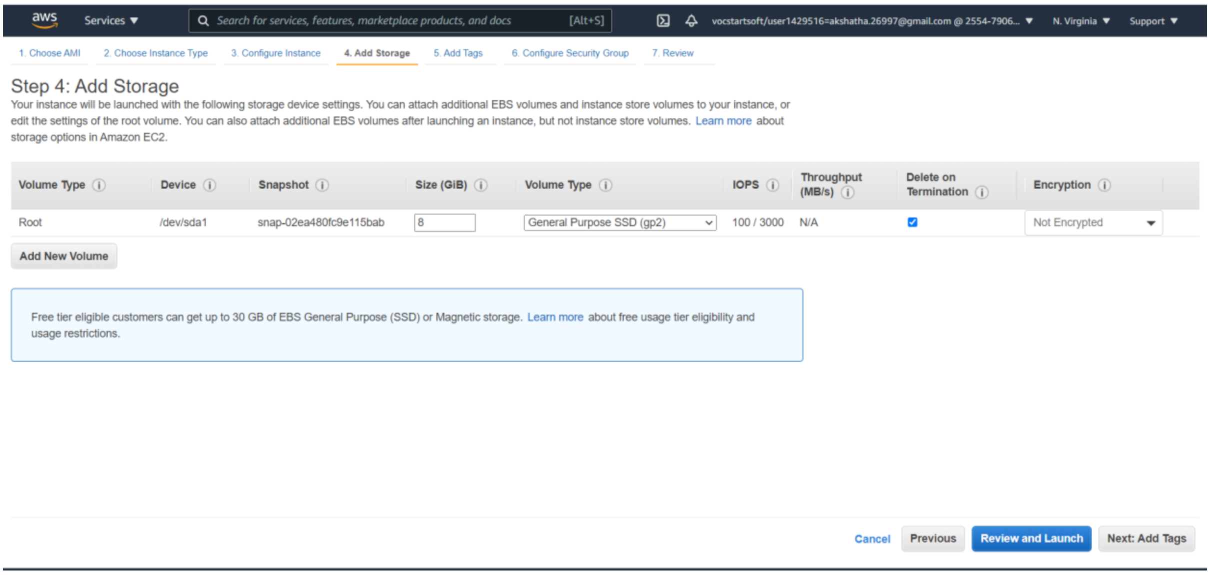
Elastic Inference	□ Add an Elastic Inference accelerator Additional charges apply.
Credit specification	□ Unlimited Additional charges may apply
File systems	Add file system Create new file system

▼ Advanced Details

Enclave	□ Enable
Metadata accessible	Enabled
Metadata version	V1 and V2 (token optional)
Metadata token response hop limit	1
User data	● As text ○ As file □ Input is already base64 encoded

```
sudo apt-get update
sudo apt install default-jdk -y
```

5. Let the storage be default as 8GB.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1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review

Step 4: Add Storage

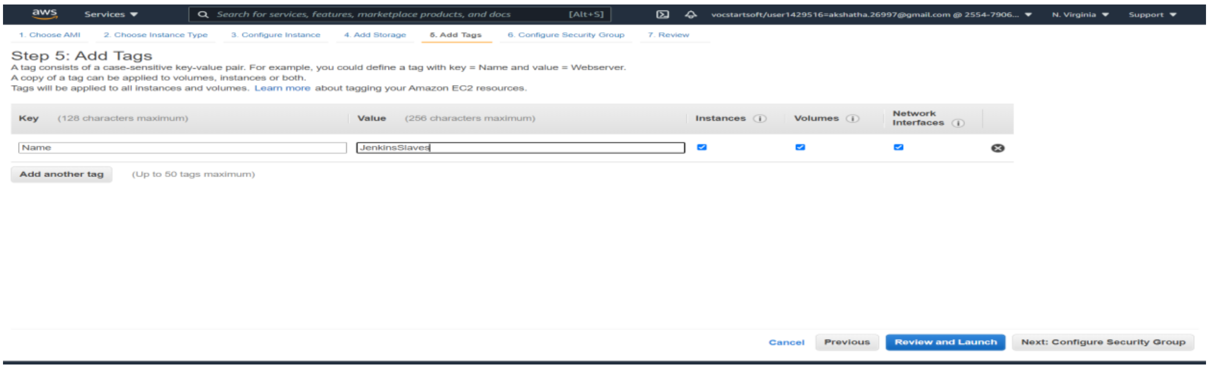
Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/sda1	snap-02ea480fc9e115bab	8	General Purpose SSD (gp2)	100 / 3000	N/A	☑	Not Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. Learn more about free usage tier eligibility and usage restrictions.

6. Add name tag as ‘JenkinsSlaves’.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1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review

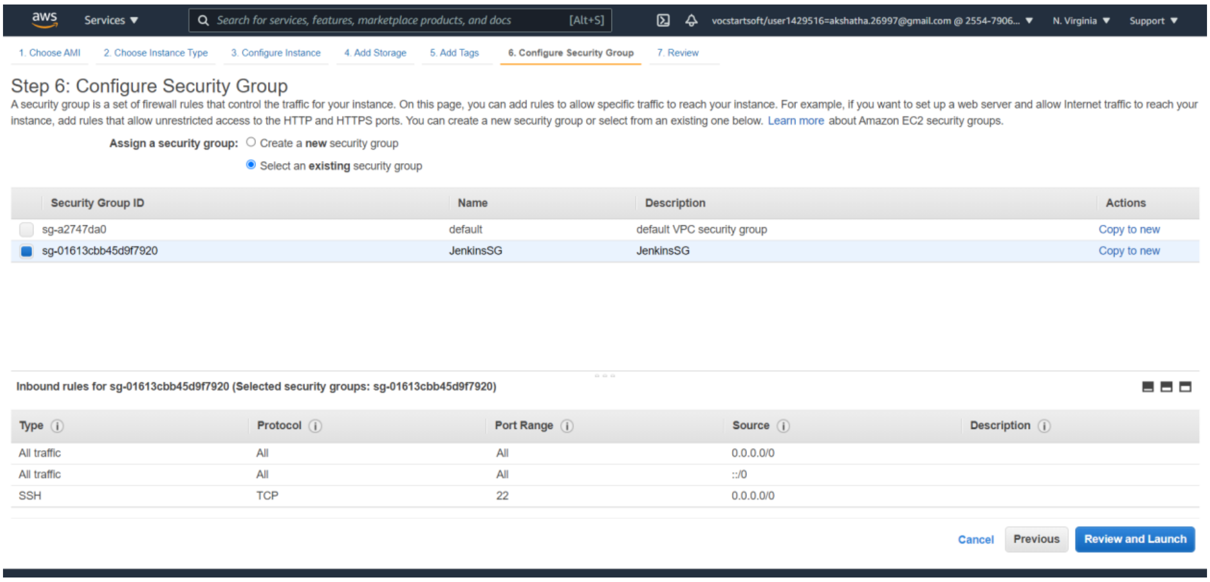
Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.
A copy of a tag can be applied to volumes, instances or both.
Tags will be applied to all instances and volumes. Learn more about tagging your Amazon EC2 resources.

Key (128 characters maximum)	Value (256 characters maximum)	Instances	Volumes	Network Interfaces	
Name	JenkinsSlaves	☑	☑	☑	⊗

Add another tag (Up to 50 tags maximum)

7. Select the previosuly created security group.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N. Virginia
Support
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. Learn more about Amazon EC2 security groups.

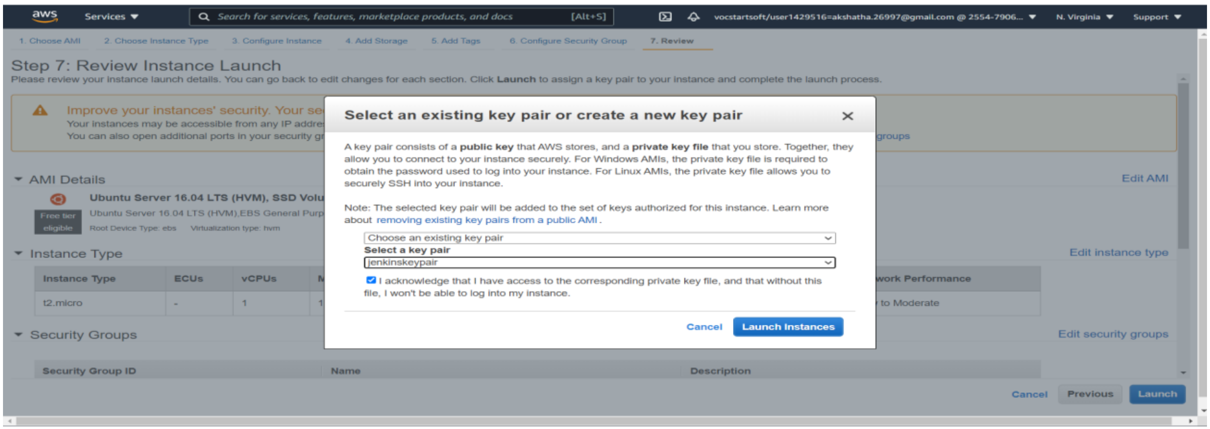
Assign a security group: ○ Create a **new** security group
● Select an **existing** security group

	Security Group ID	Name	Description	Actions
□	sg-a2747da0	default	default VPC security group	Copy to new
■	sg-01613cbb45d9f7920	JenkinsSG	JenkinsSG	Copy to new

Inbound rules for sg-01613cbb45d9f7920 (Selected security groups: sg-01613cbb45d9f7920)

Type	Protocol	Port Range	Source	Description
All traffic	All	All	0.0.0.0/0	
All traffic	All	All	::/0	
SSH	TCP	22	0.0.0.0/0	

8. Launch the instance by selecting an existing key-pair.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N. Virginia
Support
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

Improve your instances' security. Your se
Your instances may be accessible from any IP addre
You can also open additional ports in your security gr ... groups

AMI Details — Edit AMI

Ubuntu Server 16.04 LTS (HVM), SSD Volu
Free tier eligible
Ubuntu Server 16.04 LTS (HVM),EBS General Purp
Root Device Type: ebs Virtualization type: hvm

Instance Type — Edit instance type

Instance Type	ECUs	vCPUs	M	...work Performance
t2.micro	-	1	1	... to Moderate

Security Groups — Edit security groups

Security Group ID	Name	Description

Select an existing key pair or create a new key pair ✕

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about removing existing key pairs from a public AMI .

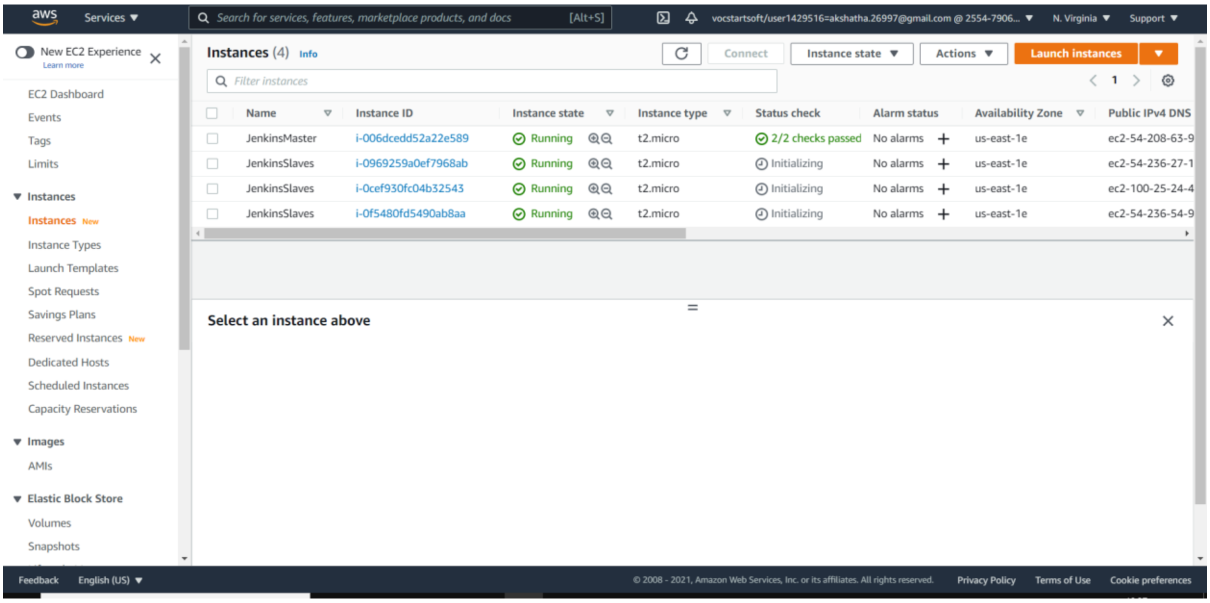
Choose an existing key pair

Select a key pair

jenkinskeypair

☑ I acknowledge that I have access to the corresponding private key file, and that without this file, I won't be able to log into my instance.

9. As seen in the console , Jenkins slave nodes are running successfully.



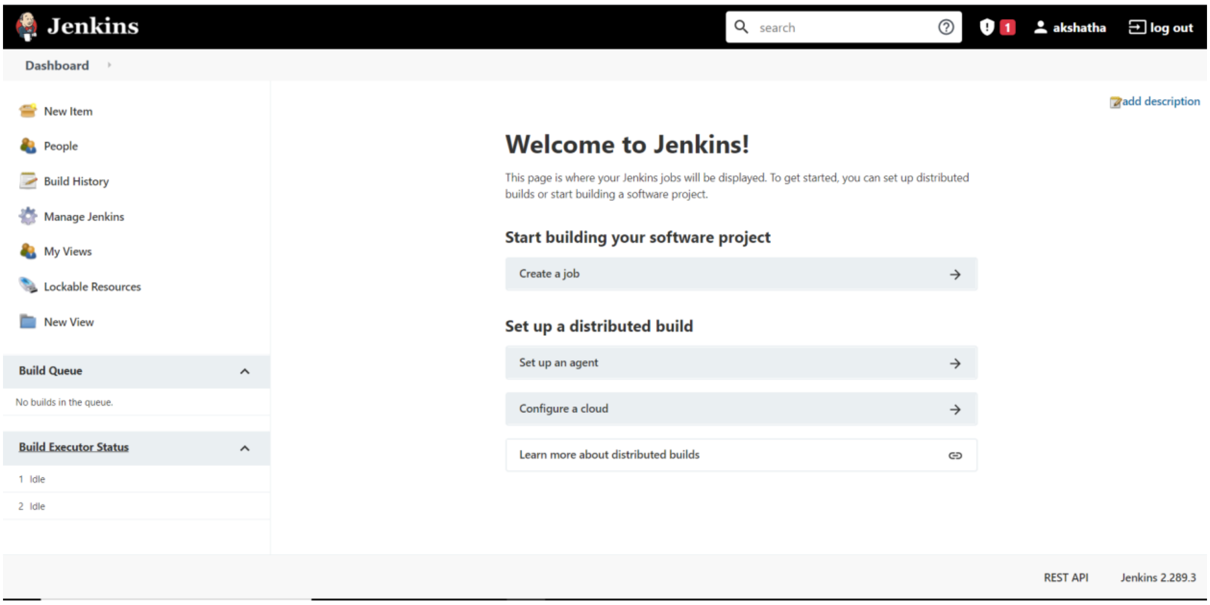
Instances (4) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
JenkinsMaster	i-006dcedd52a22e589	Running	t2.micro	2/2 checks passed	No alarms	us-east-1e	ec2-54-208-63-9
JenkinsSlaves	i-0969259a0ef7968ab	Running	t2.micro	Initializing	No alarms	us-east-1e	ec2-54-236-27-1
JenkinsSlaves	i-0cef930fc04b32543	Running	t2.micro	Initializing	No alarms	us-east-1e	ec2-100-25-24-4
JenkinsSlaves	i-0f5480fd5490ab8aa	Running	t2.micro	Initializing	No alarms	us-east-1e	ec2-54-236-54-9

Select an instance above

- Deploying application in slave nodes.

1. Jenkins UI can be accessed using the public IP of the jenkins master instance.



Welcome to Jenkins!

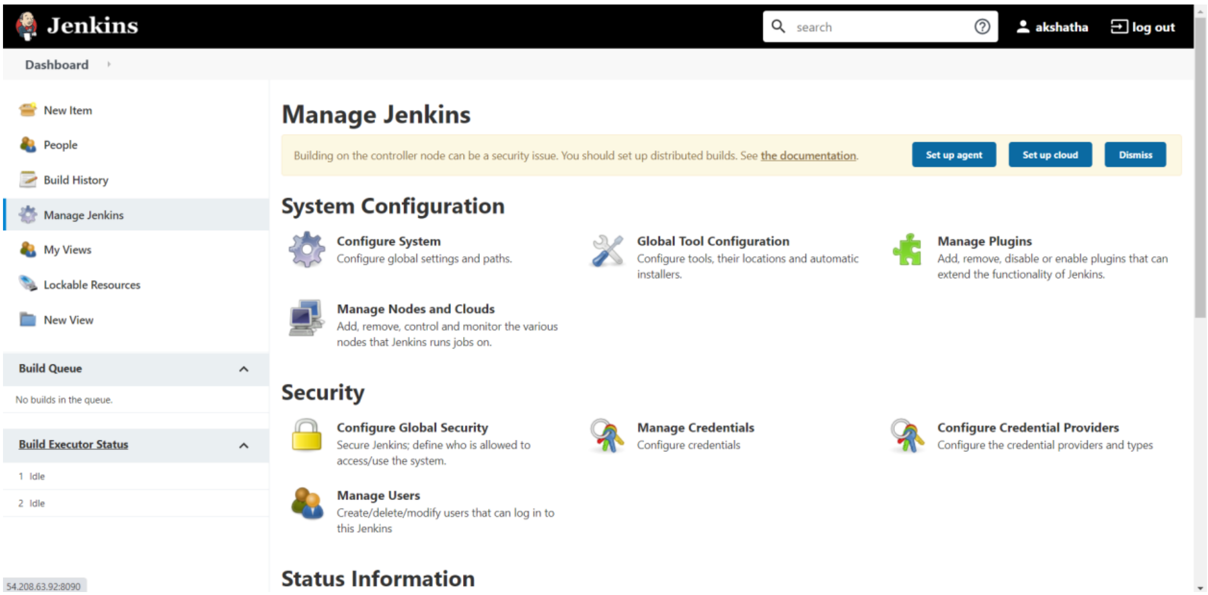
This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.

Start building your software project

Set up a distributed build

No builds in the queue.

2. Select '*Manage nodes*' and then click on '*Manage nodes and clouds*'



Jenkins

search

akshatha log out

Dashboard

- New Item
- People
- Build History
- Manage Jenkins
- My Views
- Lockable Resources
- New View

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

54.208.63.92:8090

Manage Jenkins

Building on the controller node can be a security issue. You should set up distributed builds. See the documentation. Set up agent | Set up cloud | Dismiss

System Configuration

Configure System Configure global settings and paths.

Global Tool Configuration Configure tools, their locations and automatic installers.

Manage Plugins Add, remove, disable or enable plugins that can extend the functionality of Jenkins.

Manage Nodes and Clouds Add, remove, control and monitor the various nodes that Jenkins runs jobs on.

Security

Configure Global Security Secure Jenkins; define who is allowed to access/use the system.

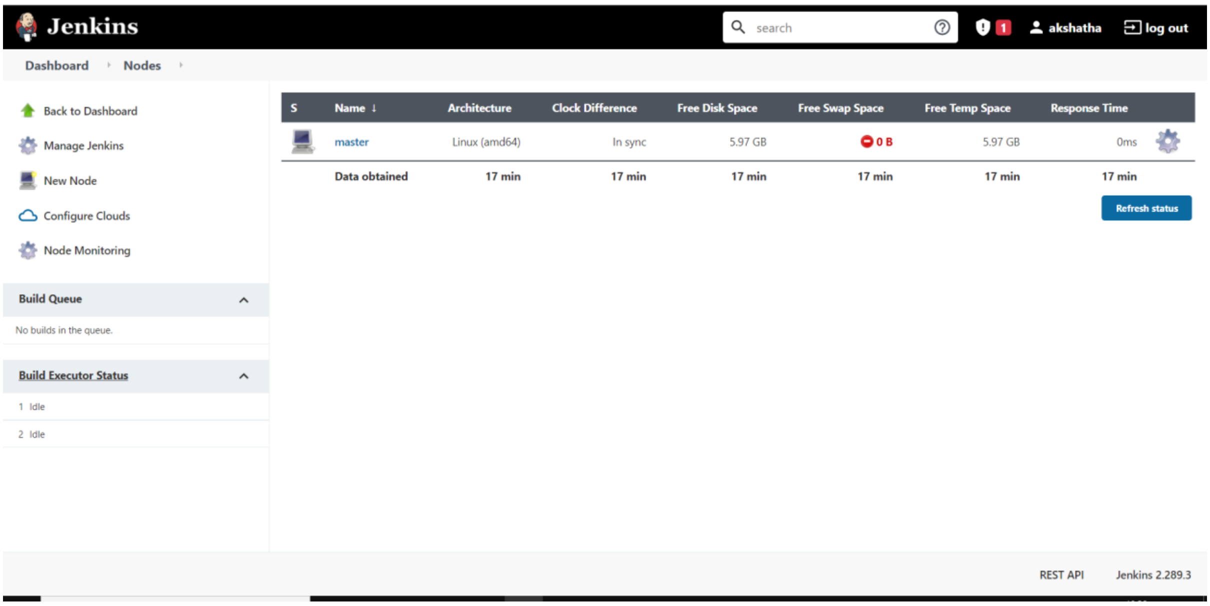
Manage Credentials Configure credentials

Configure Credential Providers Configure the credential providers and types

Manage Users Create/delete/modify users that can log in to this Jenkins

Status Information

3. We can see in the console that master node is running .
   Click on 'New node' to add slave node.



Jenkins

search

1 akshatha log out

Dashboard › Nodes

- Back to Dashboard
- Manage Jenkins
- New Node
- Configure Clouds
- Node Monitoring

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

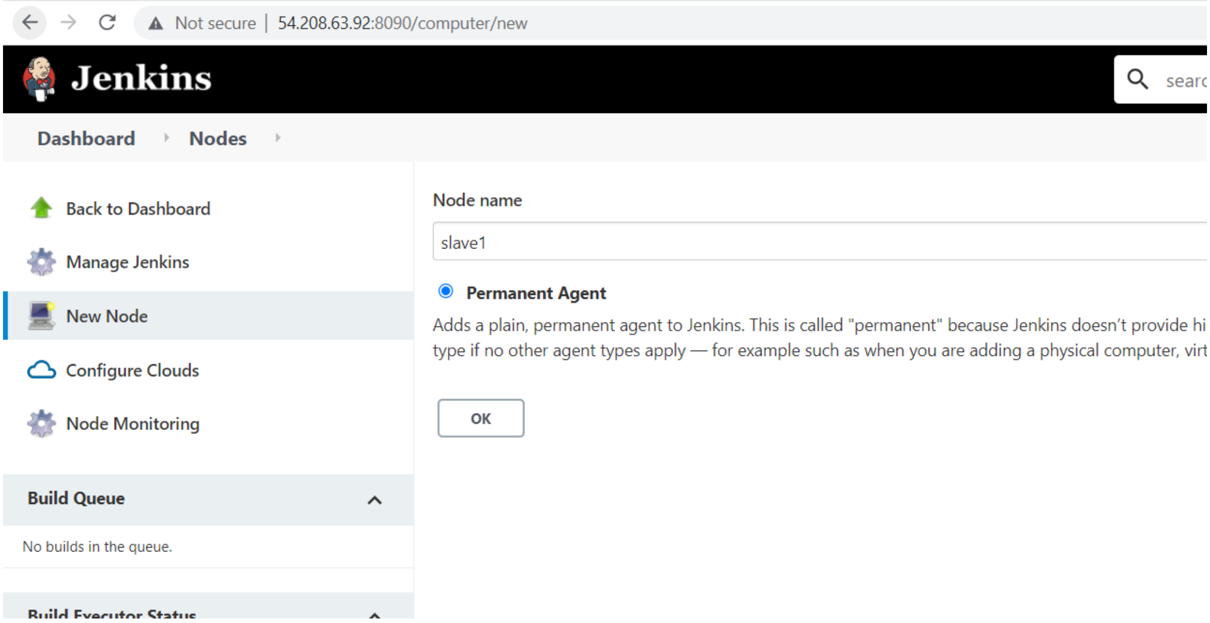
2 Idle

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	master	Linux (amd64)	In sync	5.97 GB	0 B	5.97 GB	0ms
	Data obtained	17 min	17 min	17 min	17 min	17 min	17 min

Refresh status

REST API Jenkins 2.289.3

4. Give a name to the node and select *Permanent Agent*.



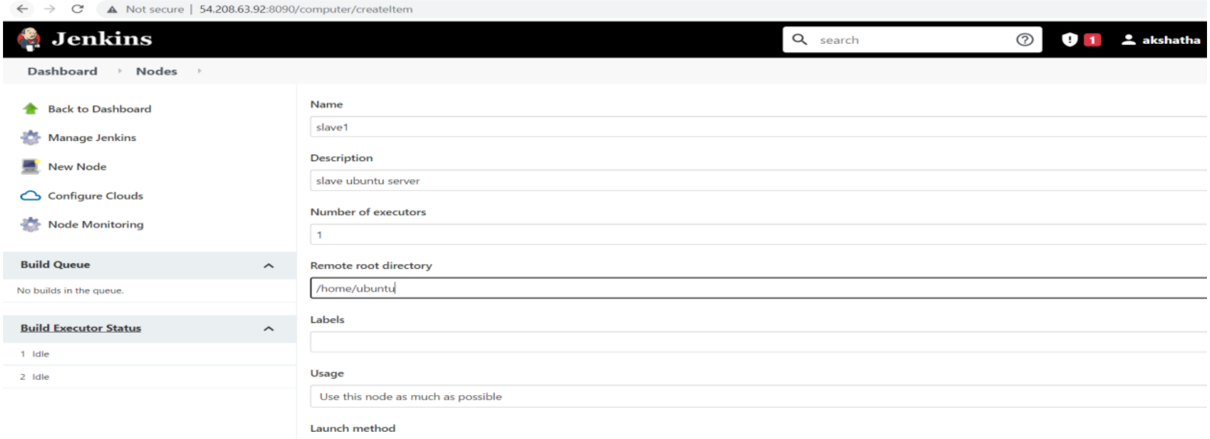
Node name

slave1

● **Permanent Agent**

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide hi type if no other agent types apply — for example such as when you are adding a physical computer, virt

5. Remote directory must be set as - */home/ubuntu*



Name

slave1

Description

slave ubuntu server

Number of executors

1

Remote root directory

/home/ubuntu

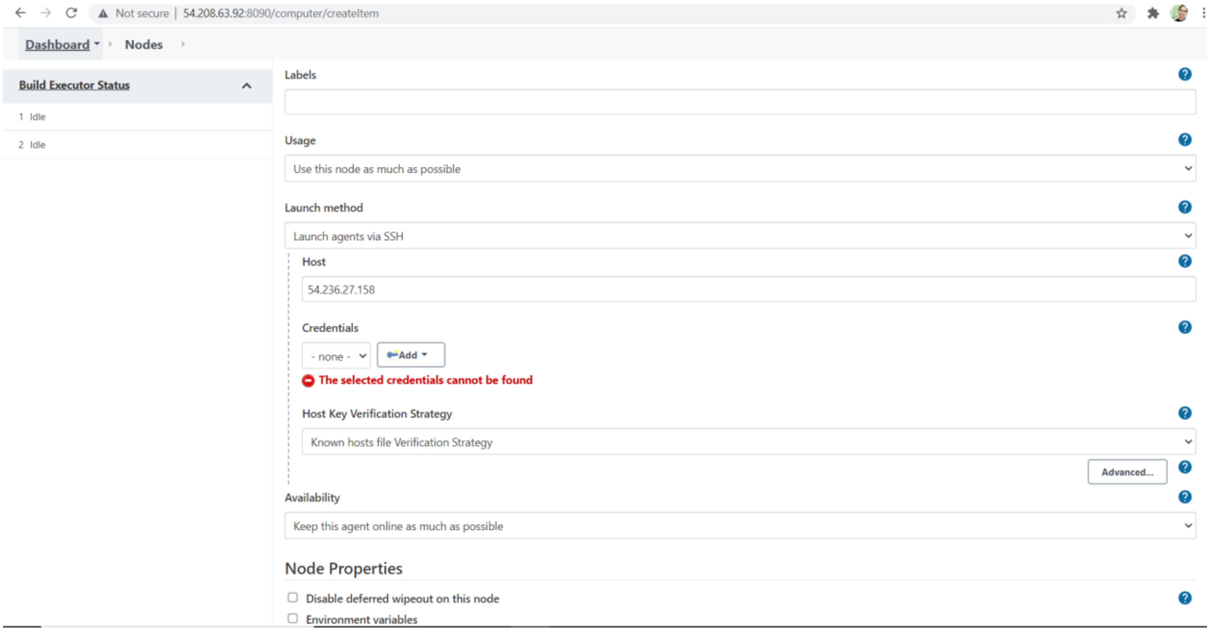
Labels

Usage

Use this node as much as possible

Launch method

6. Launch method must be '*Launch agents via SSH*'
   Give the Public IP of the instance for the '*Host*'



Not secure | 54.208.63.92:8090/computer/createItem

Dashboard > Nodes >

Build Executor Status
1 Idle
2 Idle

Labels

Usage
Use this node as much as possible

Launch method
Launch agents via SSH

Host
54.236.27.158

Credentials
- none - | Add
The selected credentials cannot be found

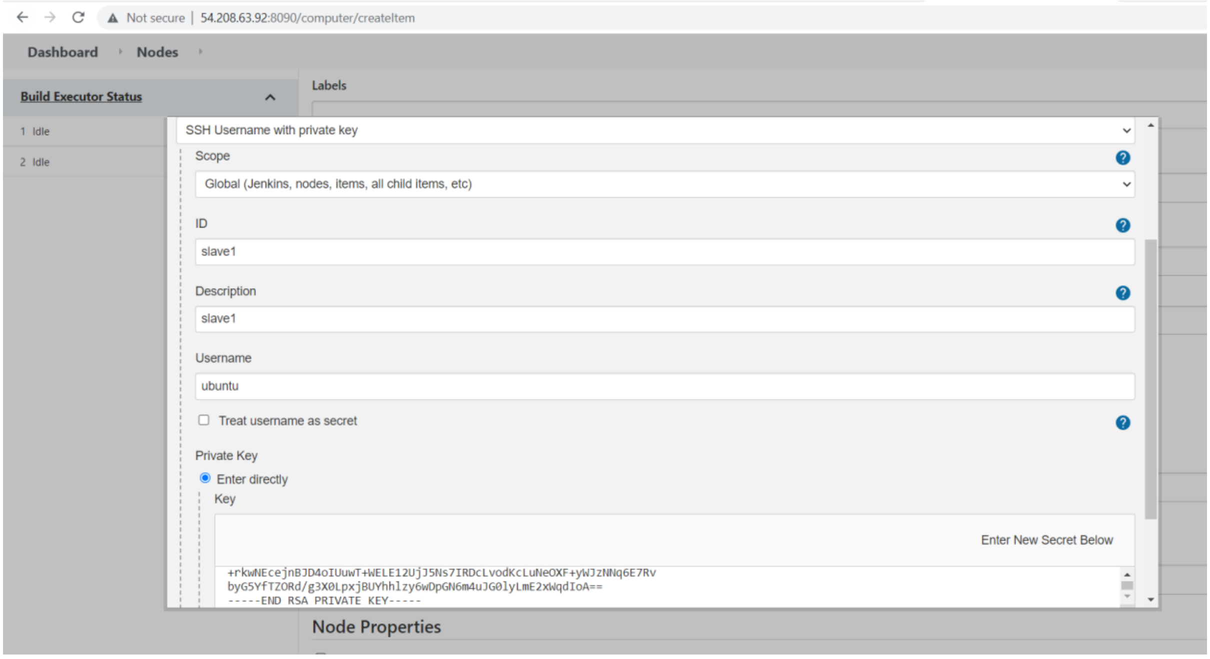
Host Key Verification Strategy
Known hosts file Verification Strategy

Advanced...

Availability
Keep this agent online as much as possible

Node Properties
□ Disable deferred wipeout on this node
□ Environment variables

7. Add credentials , by giving Username as *Ubuntu* and Scope as Global.
   Copy the content of the .pem file and paste it the private key section.



Not secure | 54.208.63.92:8090/computer/createItem

Dashboard > Nodes >

Build Executor Status
1 Idle
2 Idle

Labels

SSH Username with private key

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

ID
slave1

Description
slave1

Username
ubuntu

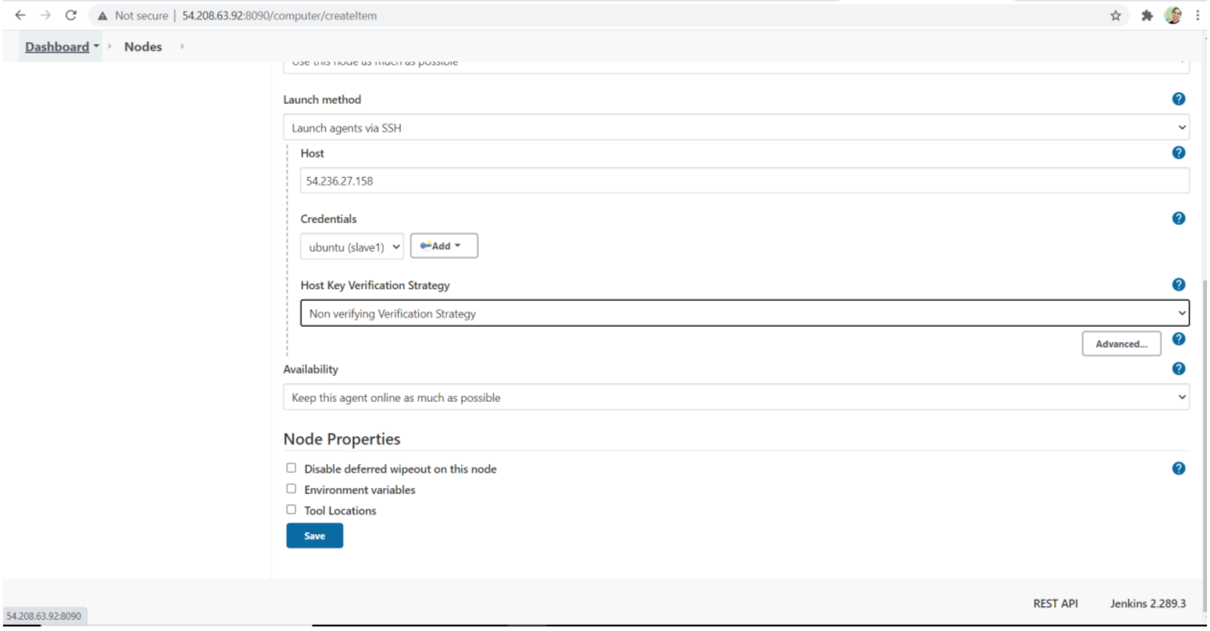
□ Treat username as secret

Private Key
● Enter directly
Key
Enter New Secret Below

```
+rkwNEcejnBJD4oIUuwT+WELE12UjJ5Ns7IRDcLvodKcLuNeOXF+yWJzNNq6E7Rv
byG5YfTZORd/g3X0LpxjBUYhhlzy6wDpGN6m4uJG0lyLmE2xWqdIoA==
-----END RSA PRIVATE KEY-----
```

Node Properties

8. Select Host Key Verifivation Strategy as 'Non Verifying Verification Strategy'



Not secure | 54.208.63.92:8090/computer/createItem

Dashboard › Nodes ›

Launch method

Launch agents via SSH

Host

54.236.27.158

Credentials

ubuntu (slave1)

Host Key Verification Strategy

Non verifying Verification Strategy

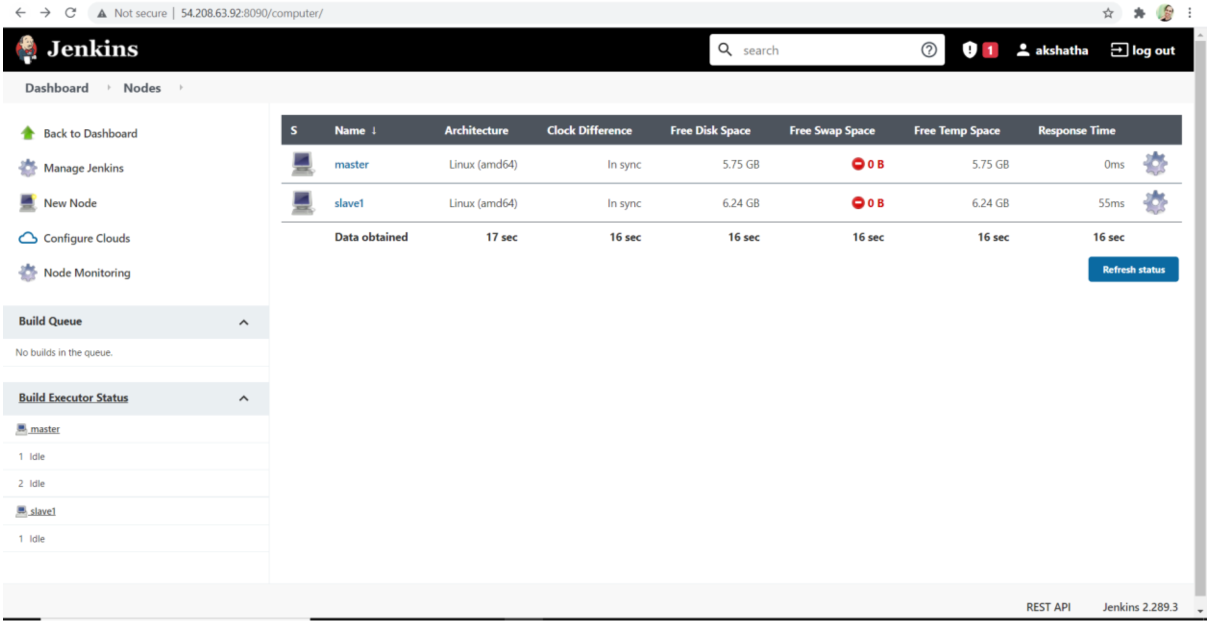
Availability

Keep this agent online as much as possible

Node Properties

☐ Disable deferred wipeout on this node
☐ Environment variables
☐ Tool Locations

9. Slave1 is configured successfully.



Not secure | 54.208.63.92:8090/computer/

Jenkins

Dashboard › Nodes ›

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	master	Linux (amd64)	In sync	5.75 GB	0 B	5.75 GB	0ms
	slave1	Linux (amd64)	In sync	6.24 GB	0 B	6.24 GB	55ms
	Data obtained	17 sec	16 sec	16 sec	16 sec	16 sec	16 sec

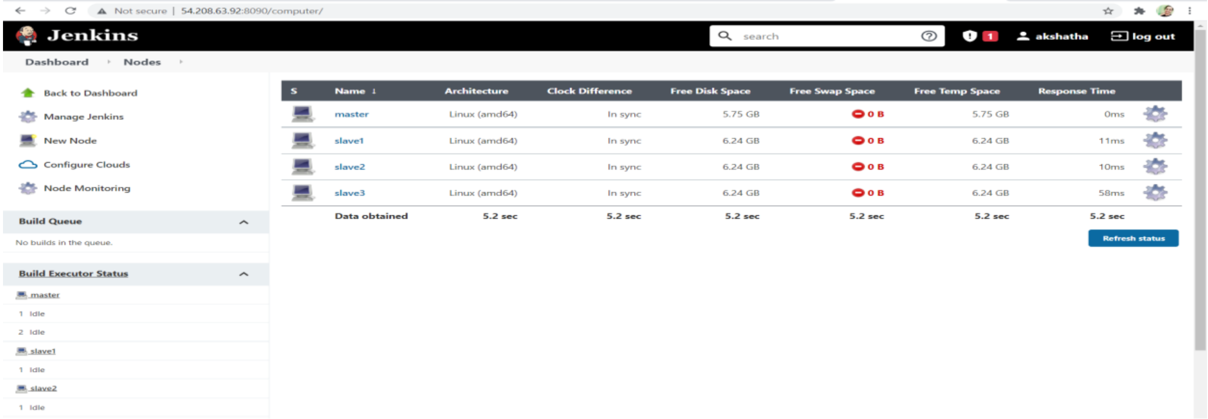
Build Queue

No builds in the queue.

Build Executor Status

master
1 Idle
2 Idle
slave1
1 Idle

10. Repeat steps 4-9 for the other instances , and 3 nodes are configured as shown in the snapshot.

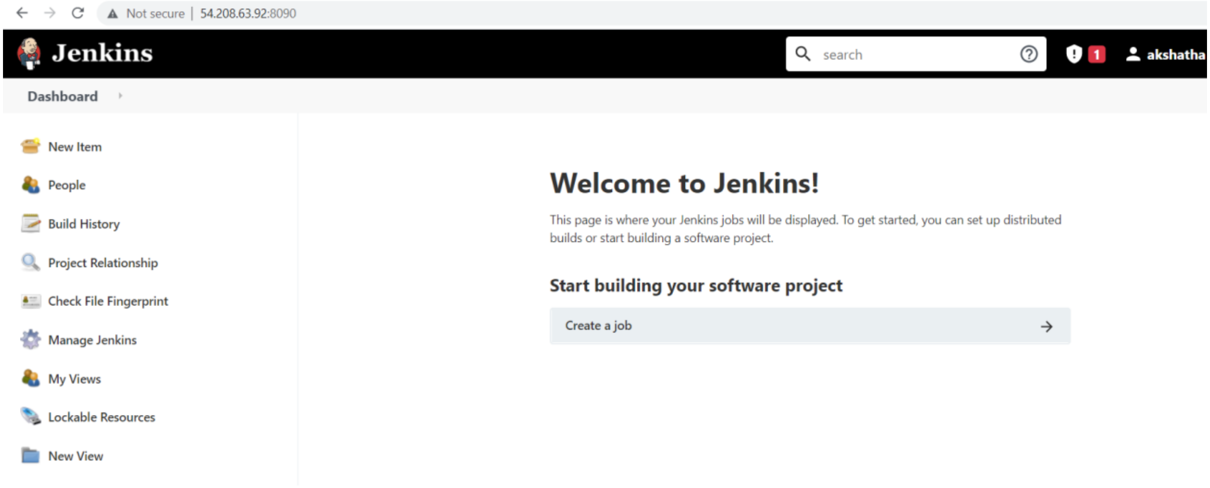


S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	master	Linux (amd64)	In sync	5.75 GB	0 B	5.75 GB	0ms
	slave1	Linux (amd64)	In sync	6.24 GB	0 B	6.24 GB	11ms
	slave2	Linux (amd64)	In sync	6.24 GB	0 B	6.24 GB	10ms
	slave3	Linux (amd64)	In sync	6.24 GB	0 B	6.24 GB	58ms
	Data obtained	5.2 sec	5.2 sec	5.2 sec	5.2 sec	5.2 sec	5.2 sec

No builds in the queue.

master
1 Idle
2 Idle
slave1
1 Idle
slave2
1 Idle

11. To deploy a pipeline , click on ‘New item’

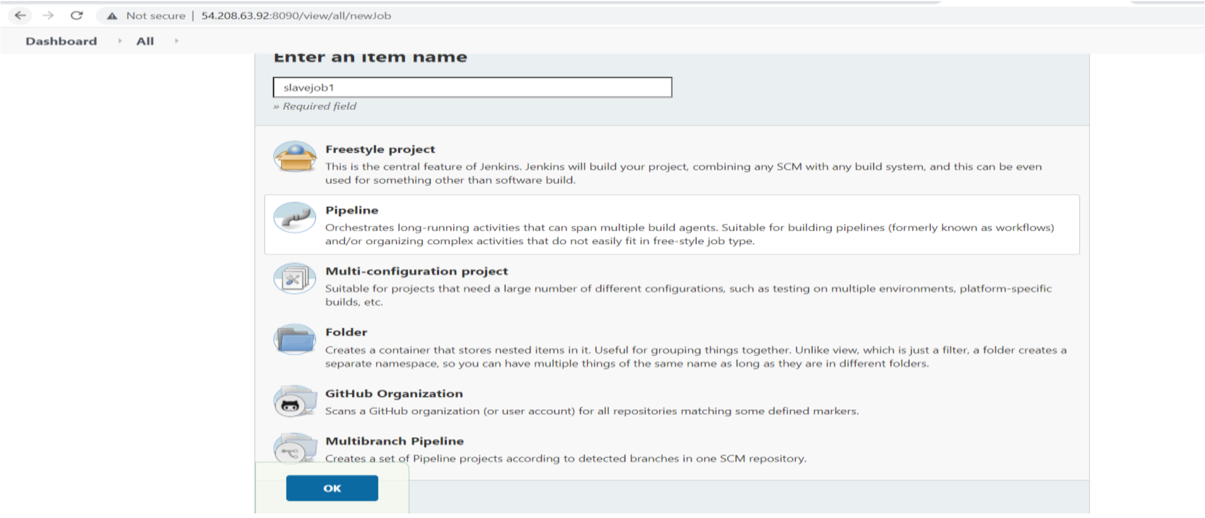


Welcome to Jenkins!

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

12. Give an appropriate item name and click on ‘Pipeline’



Enter an item name

slavejob1

» Required field

Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

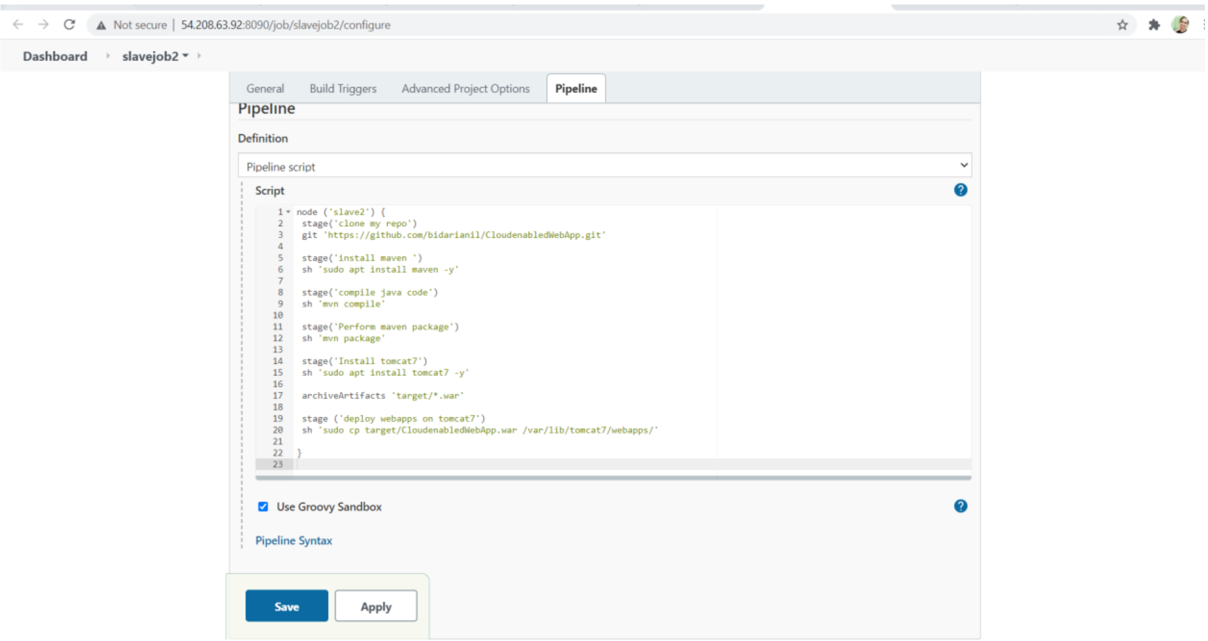
Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

GitHub Organization
Scans a GitHub organization (or user account) for all repositories matching some defined markers.

Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.

13.Place the following code in the pipeline section:

```
node ('slave1') {
 stage('clone my repo')
 git 'https://github.com/bidarianil/CloudenabledWebApp.git'

 stage('install maven ')
 sh 'sudo apt install maven -y'

 stage('compile java code')
 sh 'mvn compile'

 stage('Perform maven package')
 sh 'mvn package'

 stage('Install tomcat7')
 sh 'sudo apt install tomcat7 -y'
 archiveArtifacts 'target/*.war'

 stage ('deploy webapps on tomcat7')
 sh 'sudo cp target/CloudenabledWebApp.war /var/lib/tomcat7/webapps/'

}
```



Definition: Pipeline script

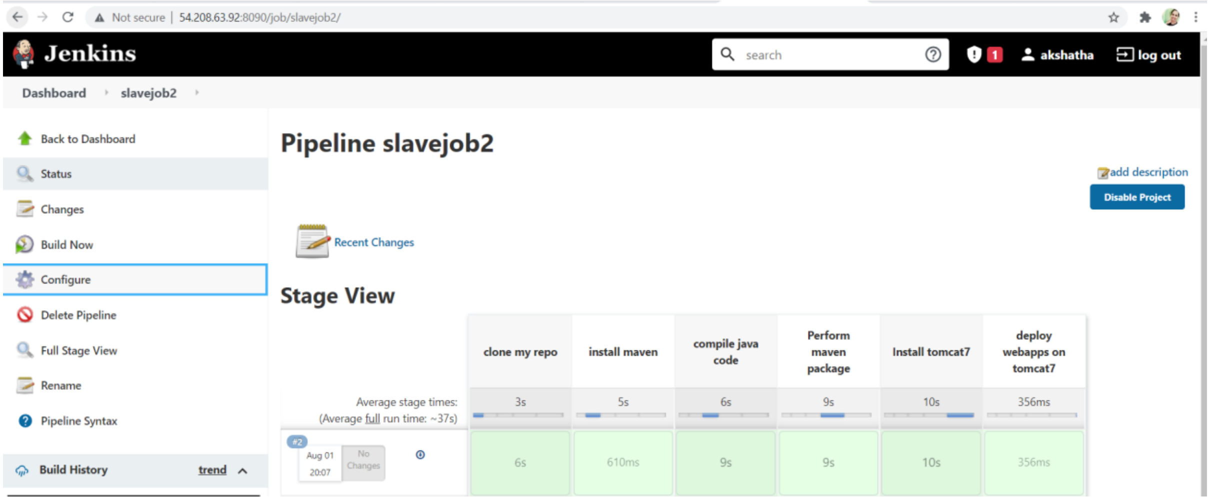
Script

```
node ('slave2') {
 stage('clone my repo')
 git 'https://github.com/bidarianil/CloudenabledWebApp.git'

 stage('install maven ')
 sh 'sudo apt install maven -y'

 stage('compile java code')
 sh 'mvn compile'

 stage('Perform maven package')
 sh 'mvn package'

 stage('Install tomcat7')
 sh 'sudo apt install tomcat7 -y'

 archiveArtifacts 'target/*.war'

 stage ('deploy webapps on tomcat7')
 sh 'sudo cp target/CloudenabledWebApp.war /var/lib/tomcat7/webapps/'

}

```

☑ Use Groovy Sandbox

Pipeline Syntax

14.Click on build now and you can see all the stages of the pipeline building successfully and turning green .



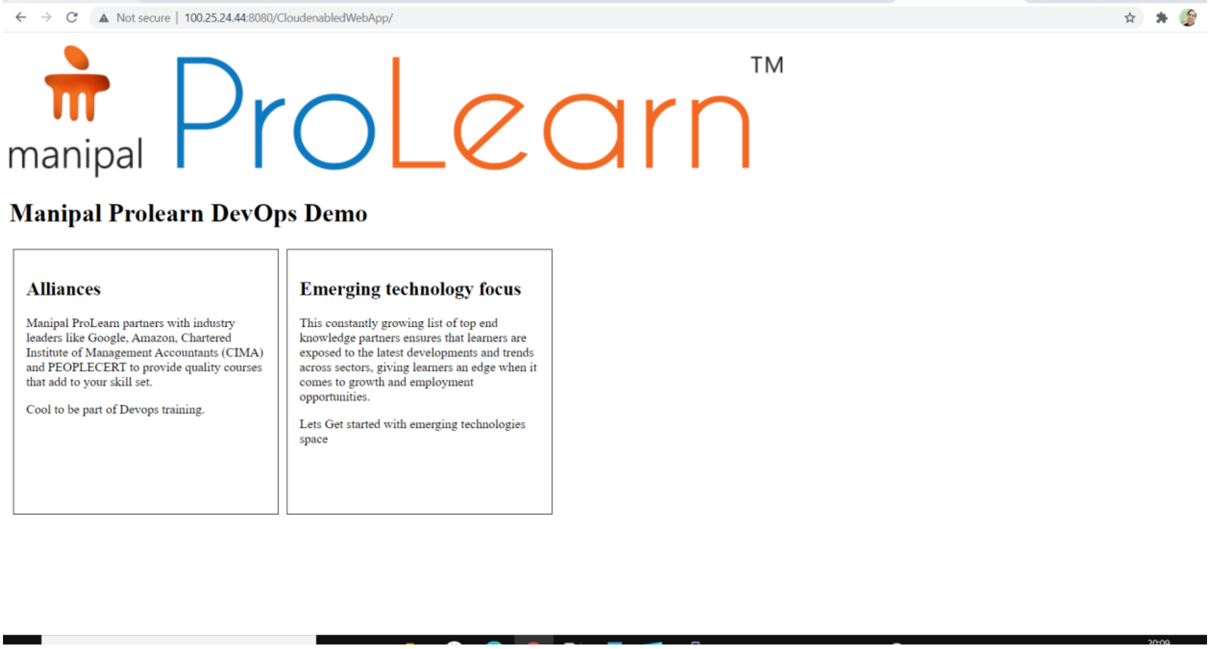
Pipeline slavejob2

Stage View

	clone my repo	install maven	compile java code	Perform maven package	Install tomcat7	deploy webapps on tomcat7
Average stage times: (Average full run time: ~37s)	3s	5s	6s	9s	10s	356ms
#2 Aug 01 20:07 No Changes	6s	610ms	9s	9s	10s	356ms

15.Visit the site - *public-ip-of-slave/CloudEnabledWebApp*

Slave 1 -



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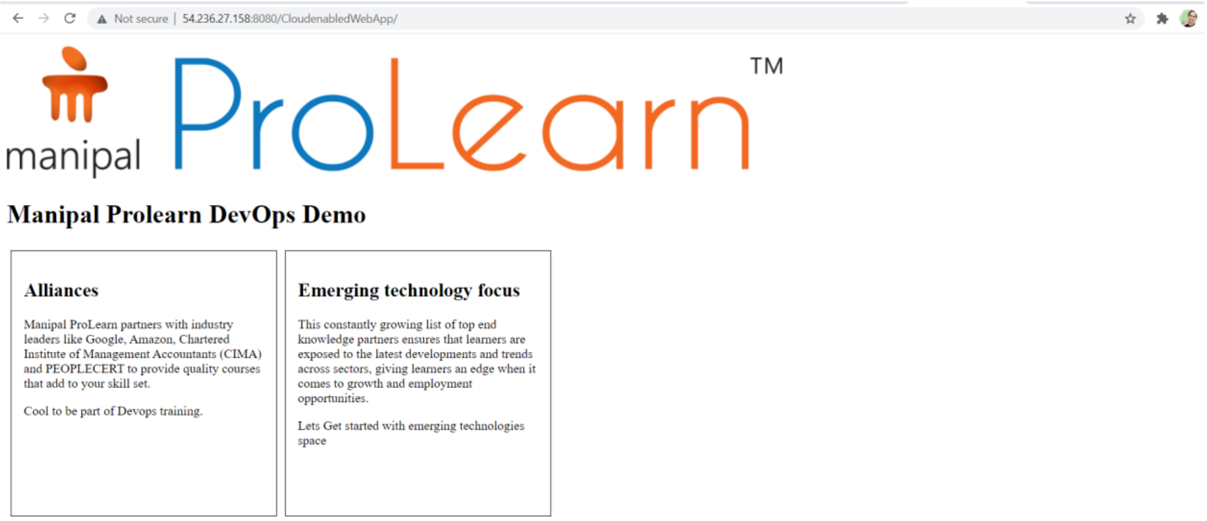
16. Repeat the above steps for other two slaves as well , and the site can be accessed by the URL - *public-ip-of-slave/CloudEnabledWebApp.*

Slave 2 -



Not secure | 54.236.27.158:8080/CloudenabledWebApp/

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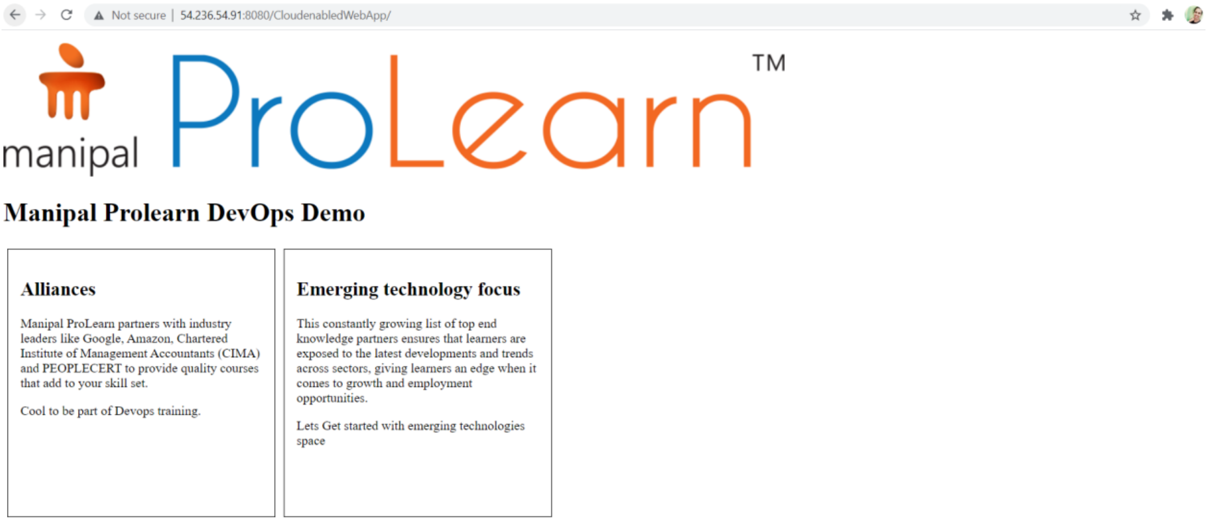
Slave 3 -



Not secure | 54.236.54.91:8080/CloudenabledWebApp/

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Submitted by ,

Akshatha L