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JENKINS RUNBOOK

DevOps Workshop

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Exercise 1: Install Jenkins of GCP server and make sure its enabled and running once installed successfully.

Solution:

1. Create one GCP Ubuntu 18.04 instance and run below commands one by one. Make sure each command executed successfully before running next command:

```
sudo apt update
sudo apt install openjdk-11-jdk
wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo a
pt-key add -

sudo sh -c 'echo deb https://pkg.jenkins.io/debian-stable binary/ > /etc/
apt/sources.list.d/jenkins.list'

sudo apt update
sudo apt install jenkins
systemctl status jenkins
```

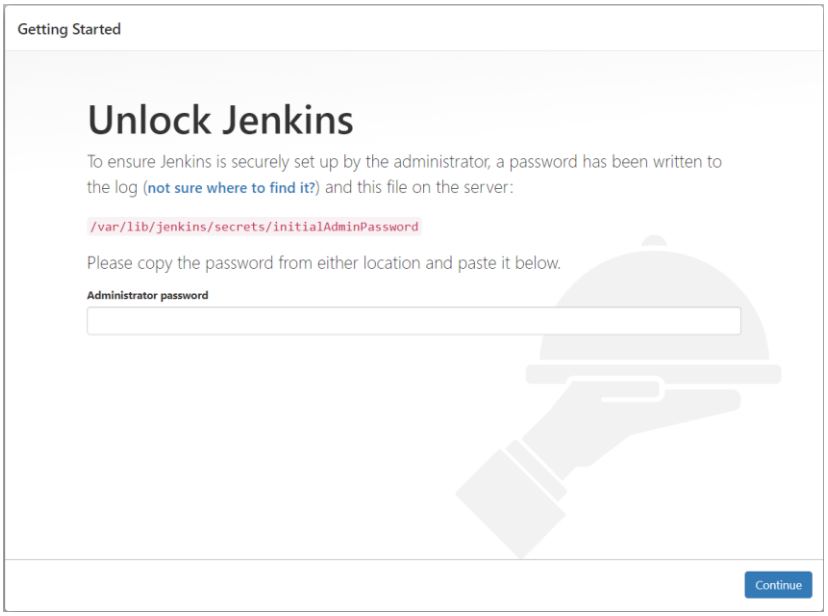
```
ubuntu@instance-1:~$ systemctl status jenkins
● jenkins.service - LSB: Start Jenkins at boot time
   Loaded: loaded (/etc/init.d/jenkins; bad; vendor preset: enabled)
   Active: active (exited) since Fri 2021-02-12 12:28:52 UTC; 4min 59s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 29631 ExecStart=/etc/init.d/jenkins start (code=exited, status=0/SUCCESS)

Feb 12 12:28:50 instance-1 systemd[1]: Starting LSB: Start Jenkins at boot time...
Feb 12 12:28:51 instance-1 jenkins[29631]: Correct java version found
Feb 12 12:28:51 instance-1 jenkins[29631]:  * Starting Jenkins Automation Server jenkins
Feb 12 12:28:51 instance-1 su[29682]: Successful su for jenkins by root
Feb 12 12:28:51 instance-1 su[29682]: + ??? root:jenkins
Feb 12 12:28:51 instance-1 su[29682]: pam_unix(su:session): session opened for user jenkins by (uid=0)
Feb 12 12:28:52 instance-1 jenkins[29631]:    ...done.
Feb 12 12:28:52 instance-1 systemd[1]: Started LSB: Start Jenkins at boot time.
```

Note: In case you face any issue, refer to the tutorial recording

Exercise 2: Complete below tasks as part of this exercise:

1. Create one more GCP server and configure it as slave node to Jenkins you installed in exercise 1:
   Solution:
   a) **Configure Jenkins**
      i. Open browser and enter masterIP:8080.
      ii. You should land on a page like this:

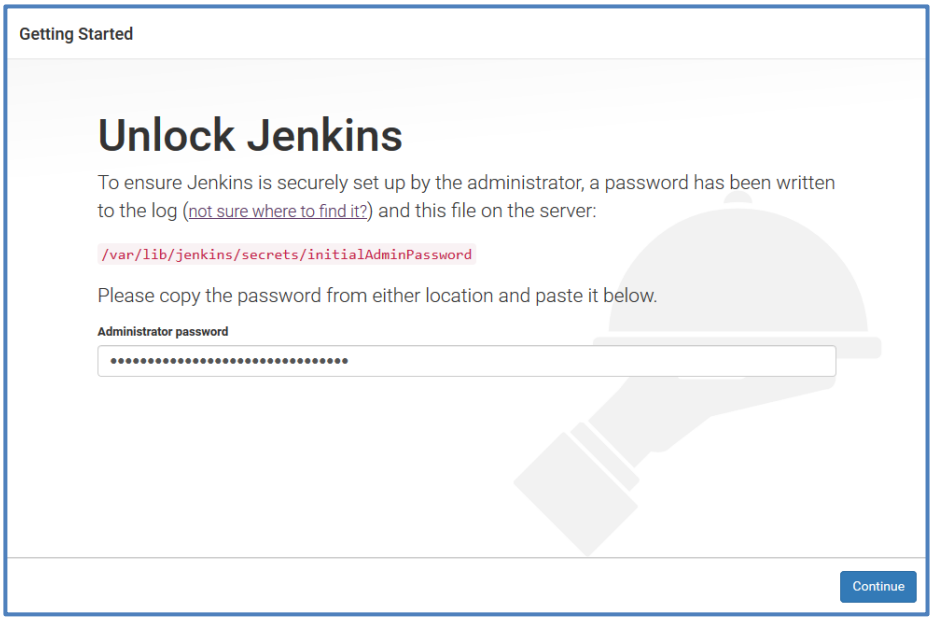


iii. Copy the path mentioned in the page and perform cat operation in master terminal.

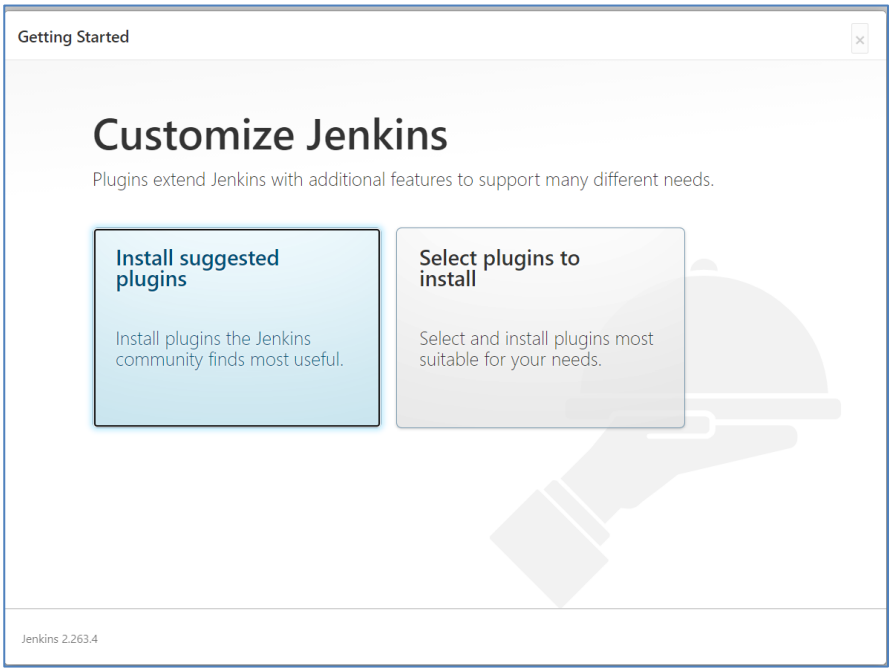
```
sudo cat <path>
```

```
ubuntu@instance-1:~$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
79f304f38fb7467382b3601a58d75b54
ubuntu@instance-1:~$
```

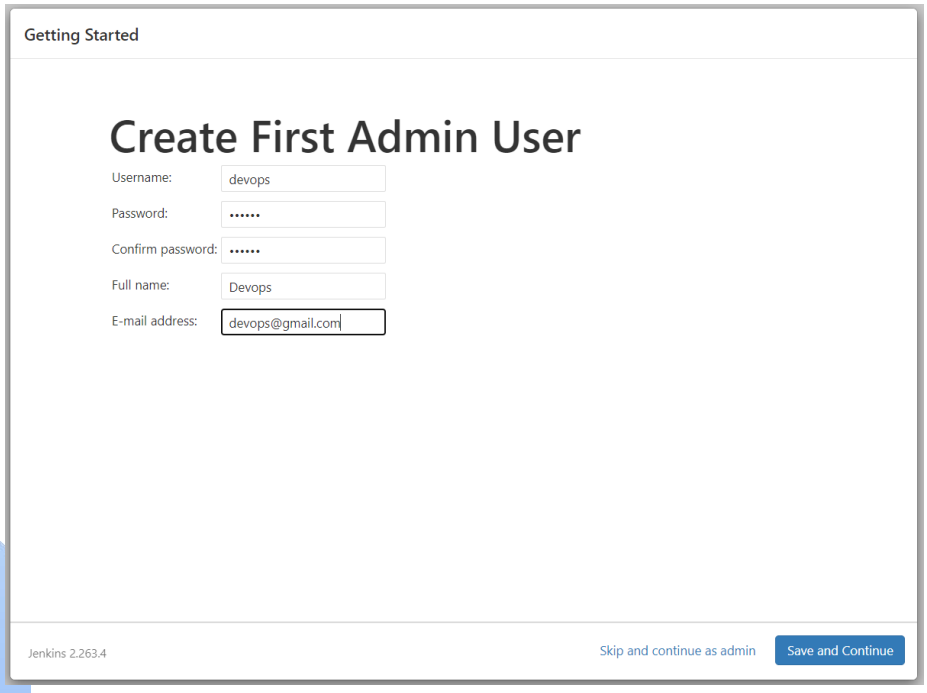
This will give us the password which we will use to unlock our Jenkins.
Copy the password from there and paste it on the Jenkins Server page.



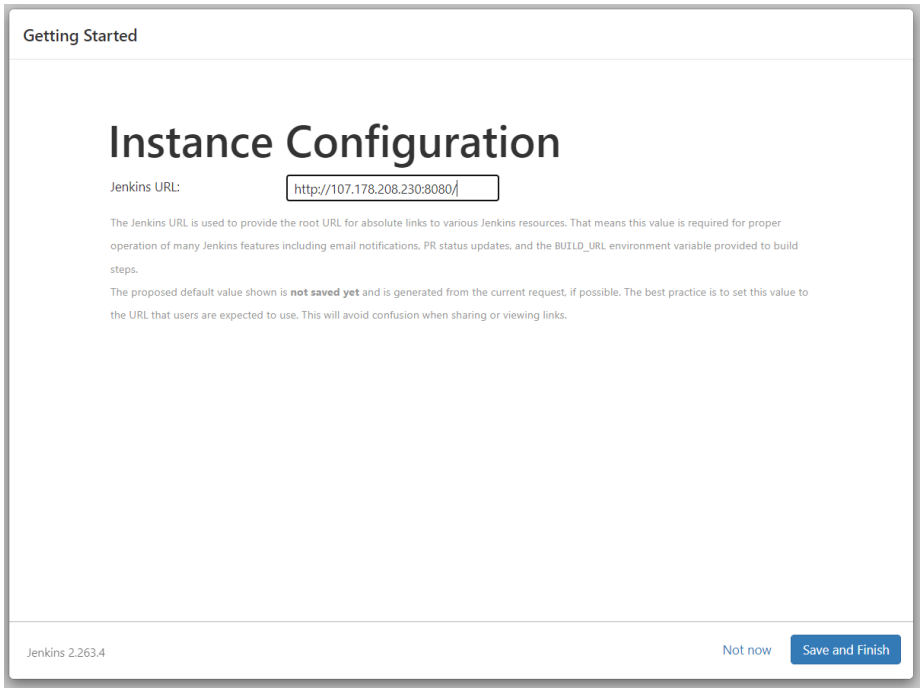
iv. Now click on continue. Then click on Install Suggested Plugins.



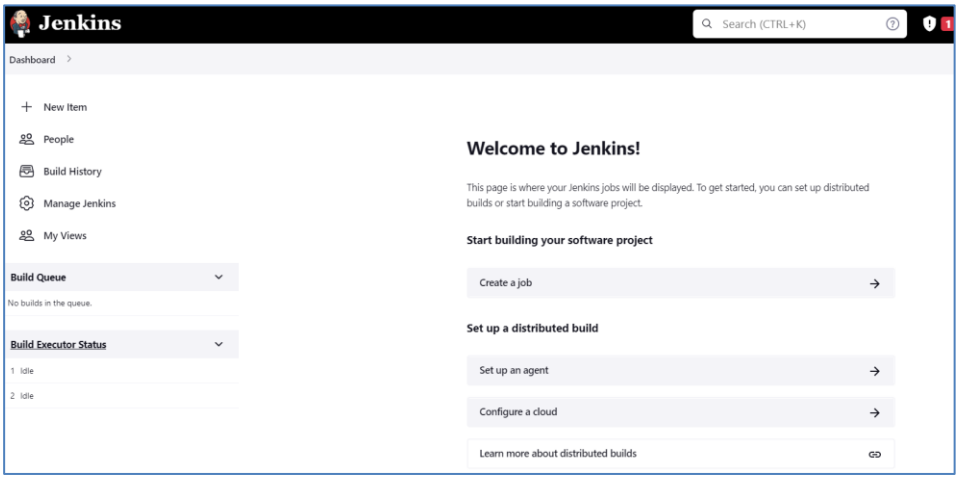
v. Once done, enter the Admin User details.



Then click on Save and Continue.



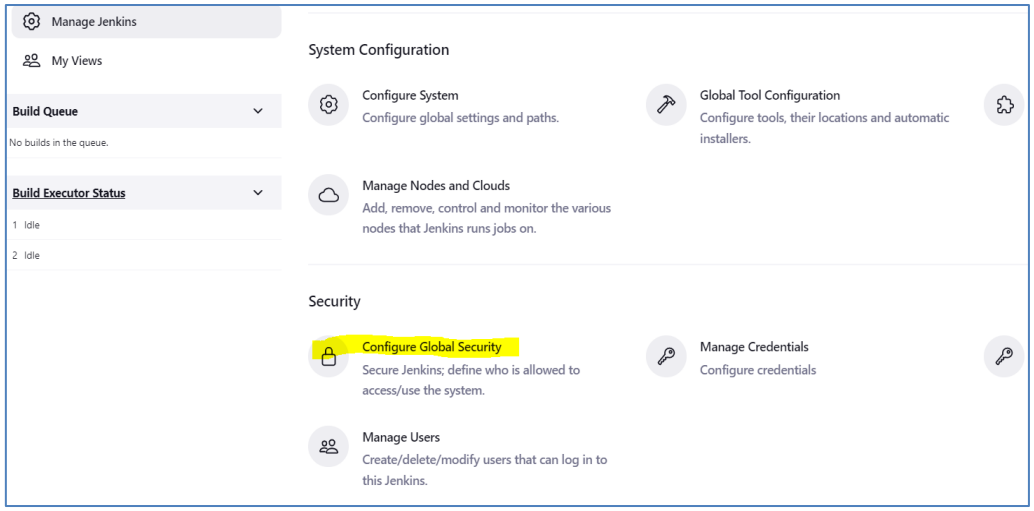
Again, click Save and Finish. Click on Install Suggested Plugins. Once it's done, we will land on a page as shown below.



This is our Jenkins Dashboard.

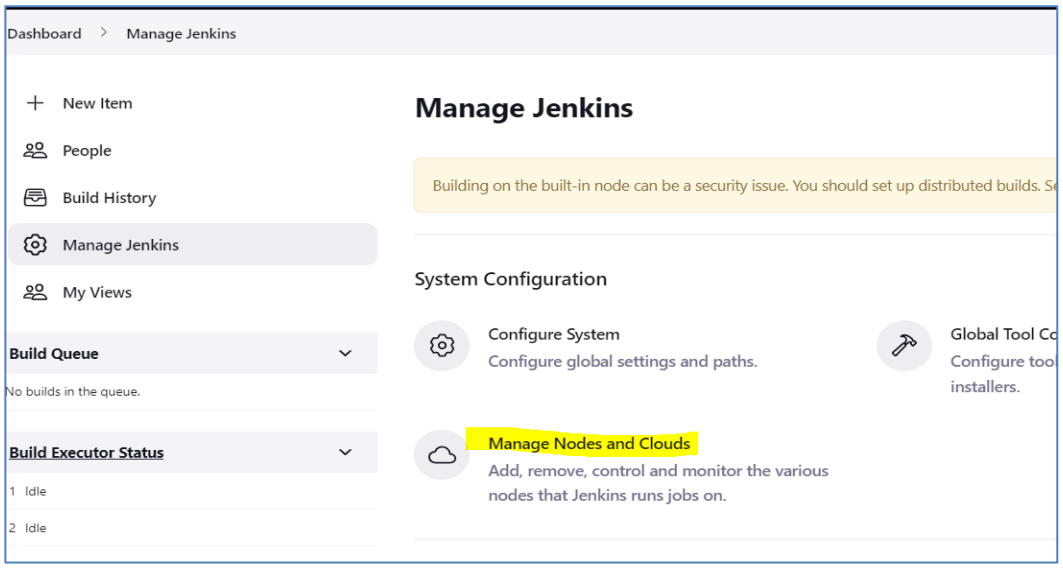
b) Configure Slave nodes

i. Go to Manage Jenkins. Click on Configure Global Security.

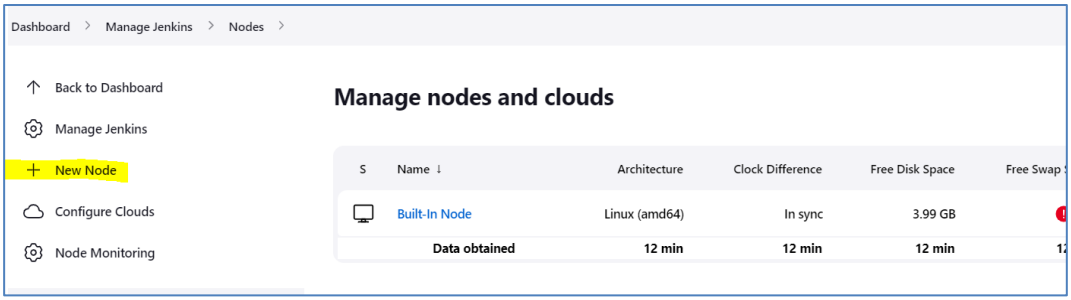


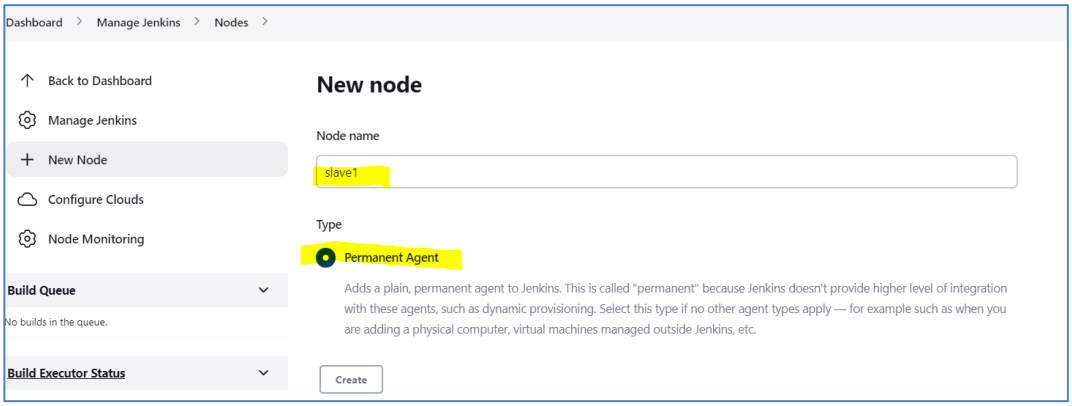
ii. Change the Agents to Random. Then click on Save.

iii. Now go to Manage Nodes.

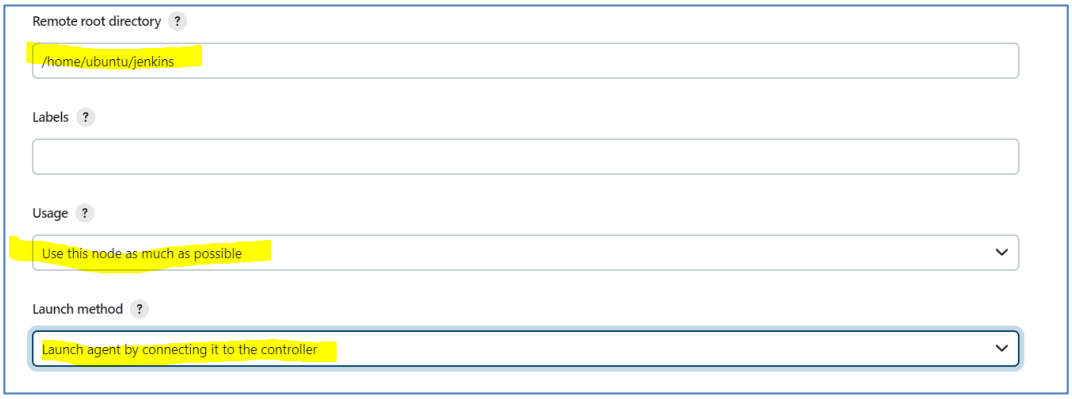


iv. Click on New Node. Add Slave1 as new node and make Permanent Agent. Click on ok.

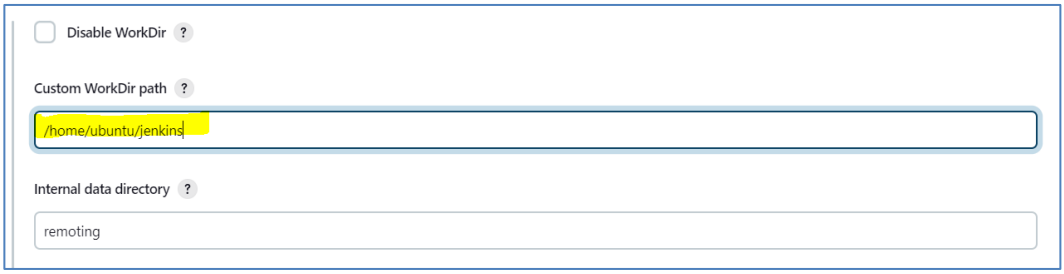


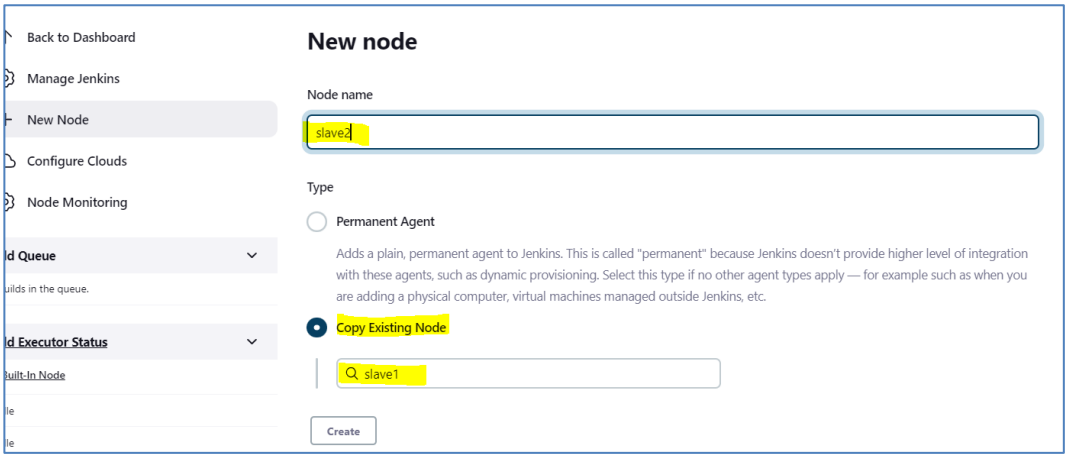


v. Go to Launch method change it to **Launch agent by connecting it to the controller**.

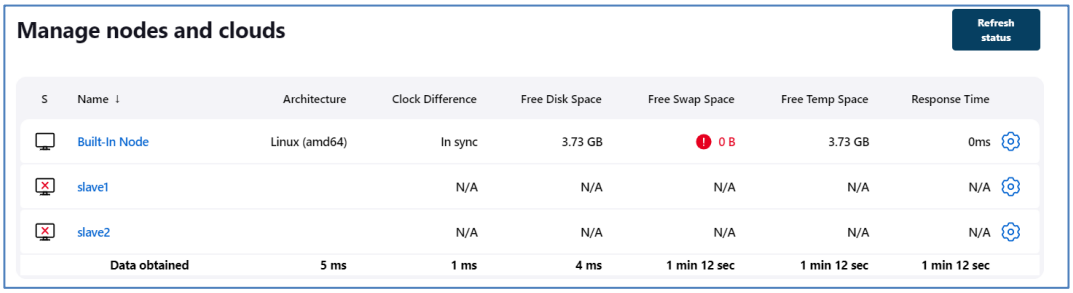


vi. Then add the current working directory path to **/home/ubuntu/jenkins**. Then click on Save.

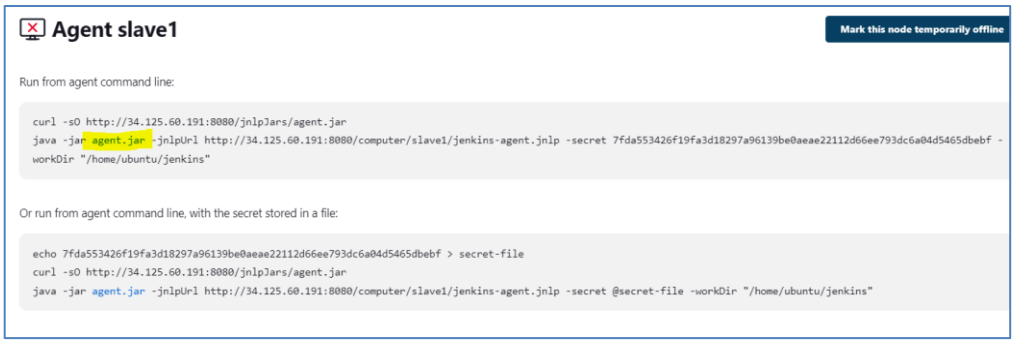




vii. Then click ok. You can see the list of nodes that we have on the Jenkins Dashboard.



viii. Go to the Jenkins Dashboard, Click on Slave1. Download the Agent.jar file by clicking on it.



ix. Now download agent.jar file and upload on the slave ubuntu server using scp, winscp or filezilla.

x. Let us verify if the file has been transferred to Slave1 or not. Open a new session of server. Connect to slave1. Run ls command.

```
ubuntu@slave1:~$ ls -ltr
total 1488
-rw-rw-r-- 1 ubuntu ubuntu 1521553 Feb 12 12:58 agent.jar
ubuntu@slave1:~$
```

As you can see the agent.jar file appears there, which means our file has been successfully transferred to Slave1.

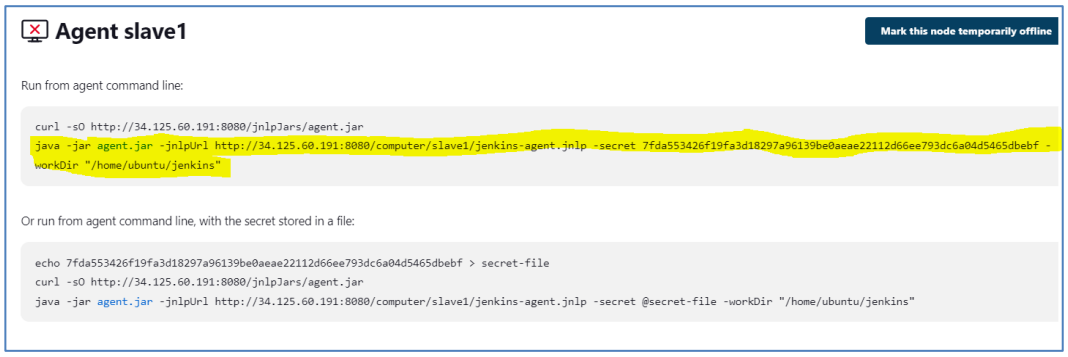
xi. Before moving ahead install OpenJDK on both Slave1

```
ubuntu@slave1:~$ sudo apt-get update
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Fetched 252 kB in 0s (583 kB/s)
Reading package lists... Done
```

xii. Now install OpenJDK on the server

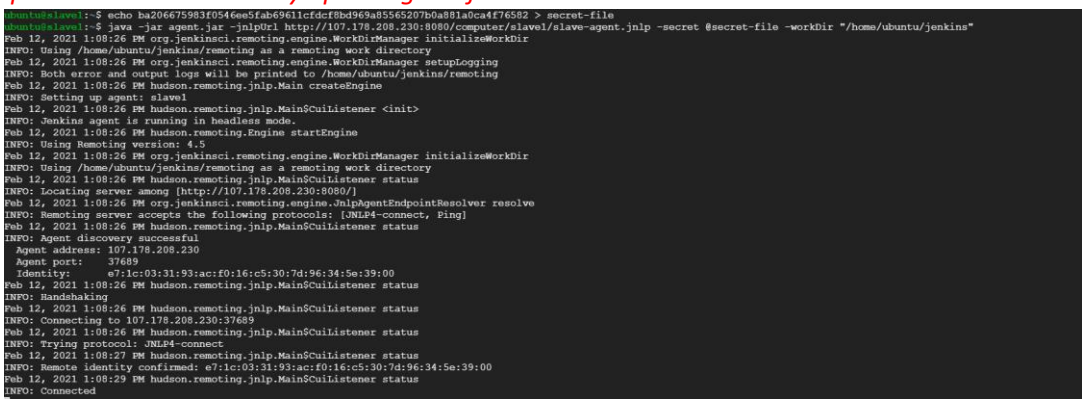
```
ubuntu@n-slave:~$ sudo apt install openjdk-11-jdk
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libnuma1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  at-spi2-core ca-certificates-java fontconfig-config fonts-dejavu-core fonts-deja
  libasound2-data libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni
  libdrm-amdgpu1 libdrm-intel1 libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libf
  libglapi-mesa libglvnd0 libglx-mesa0 libglx0 libgraphite2-3 libharfbuzz0b libic
```

xiii. Connect Slave1 to the Jenkins Server. Go to the Jenkins Dashboard, Click on Slave1, Copy the command line as shown.



xiv. Run the command on the slave node as shown below.

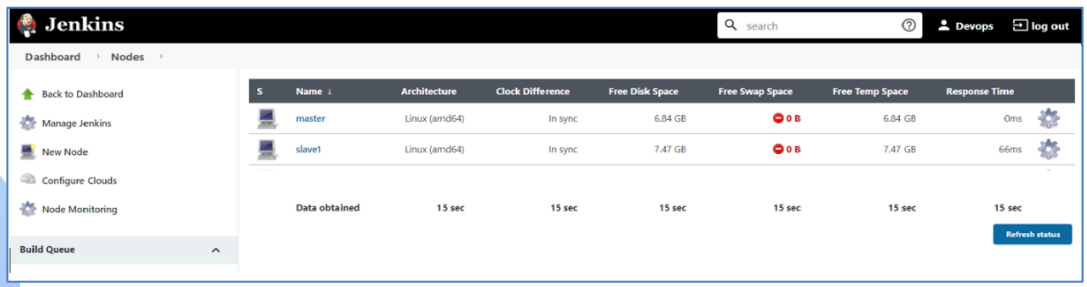
Note: *If you face any issue with port while connecting agent to master, then open that port on master server by updating the firewall attached to it.*



It shows “Connected”.

Important Note: Don’t end the Sessions that we just Connected. To perform further operations on Slave1 duplicate the slave server session.

So now that our Slave1 has been connected to Jenkins Server, it look similar to this.



2. **Create a Jenkins job to clone repo https://github.com/vistasunil/devopsIQ and deploy the website inside it the slave instance in container.**
   Solution:
   i. Open your GitHub account and import the below given repository.

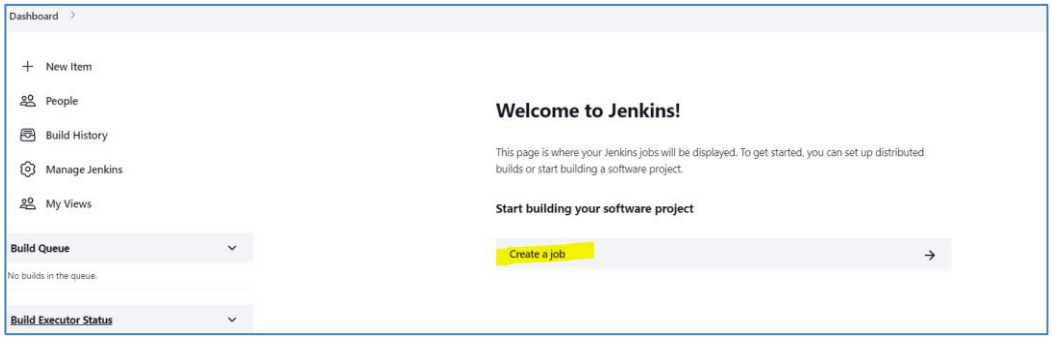
```
https://github.com/vistasunil/devopsIQ
```

   ii. Install docker on both Slave1

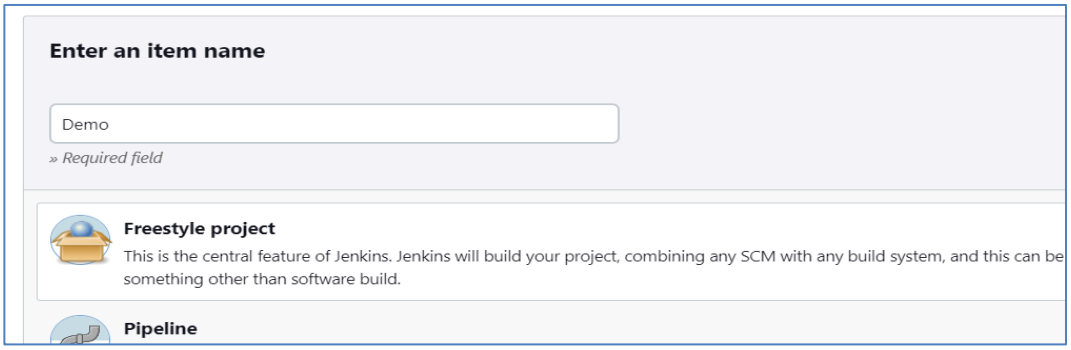
```
sudo apt install docker.io
```

```
ubuntu@ip-172-31-34-189:~$ sudo apt install docker.io
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  bridge-utils cgroupfs-mount libltdl7 pigz ubuntu-fan
Suggested packages:
  ifupdown aufs-tools debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils cgroupfs-mount docker.io libltdl7 pigz ubuntu-fan
0 upgraded, 6 newly installed, 0 to remove and 121 not upgraded.
Need to get 40.3 MB of archives.
After this operation, 198 MB of additional disk space will be used.
```

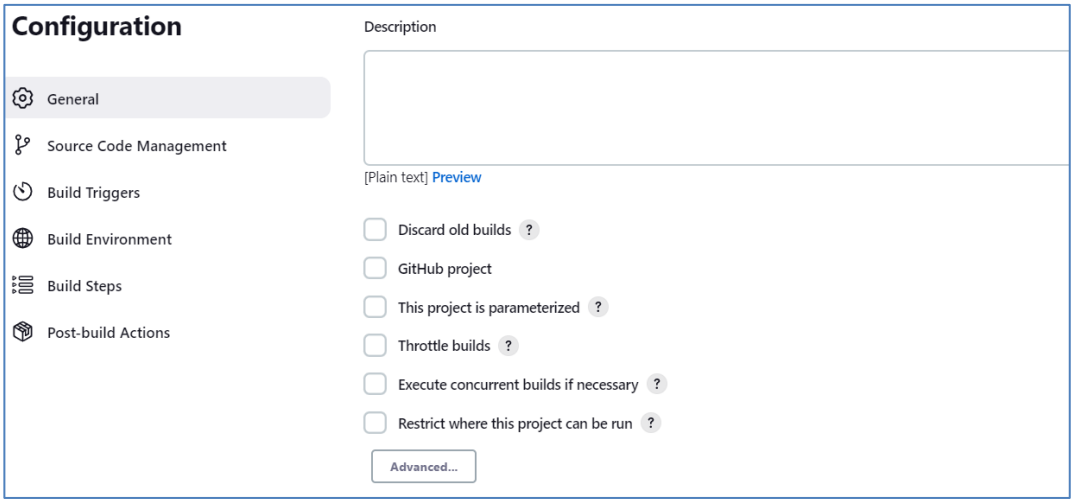
   iii. Open Jenkins Dashboard. Create a new job (Freestyle Project) for Slave1.



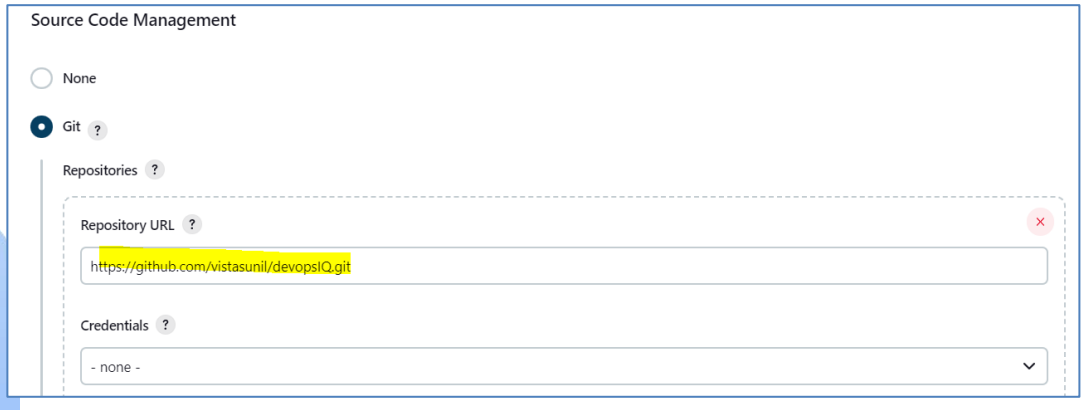
   iv. Name the Project as Demo, Select Freestyle Project option.



Then click on Ok.
You should land on a page like this.

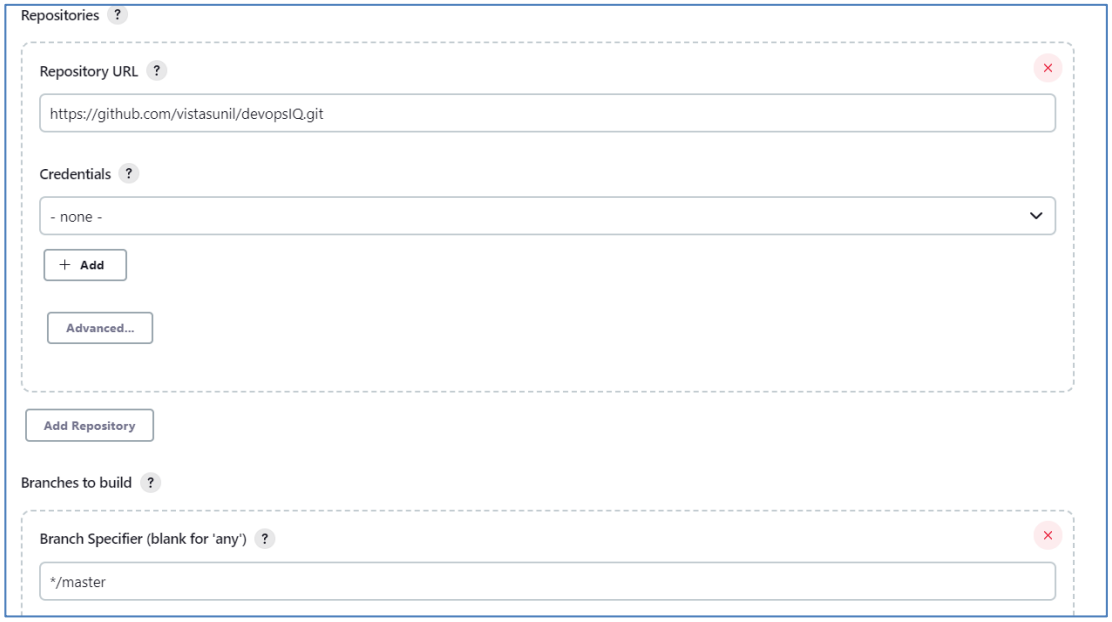


v. Place your git repository link as shown below.



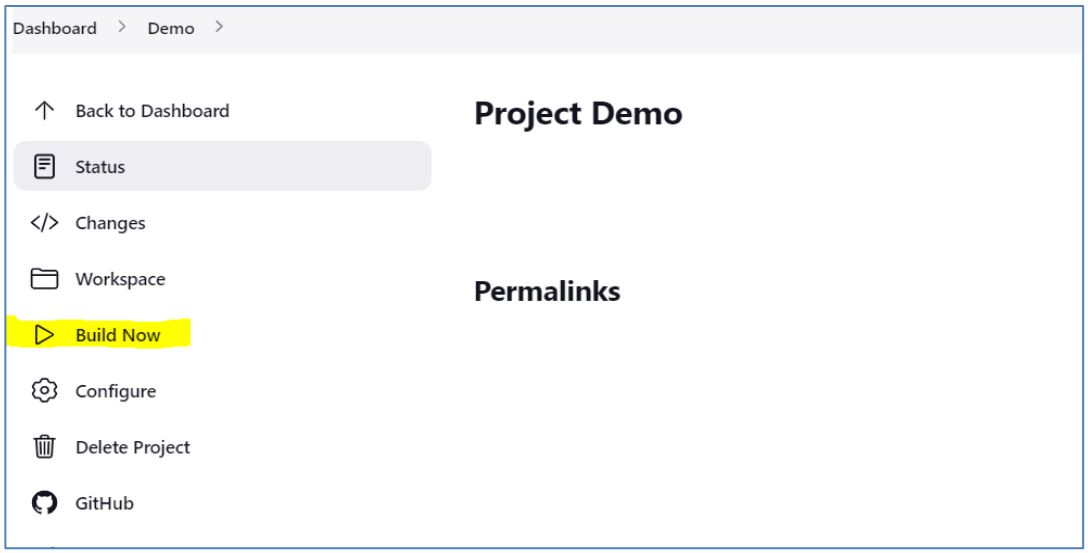
vi. Click on Restrict where this project can be run. Add Slave1 there.

vii. Go to Source Code Management, click on git, add the git repository link there as well.

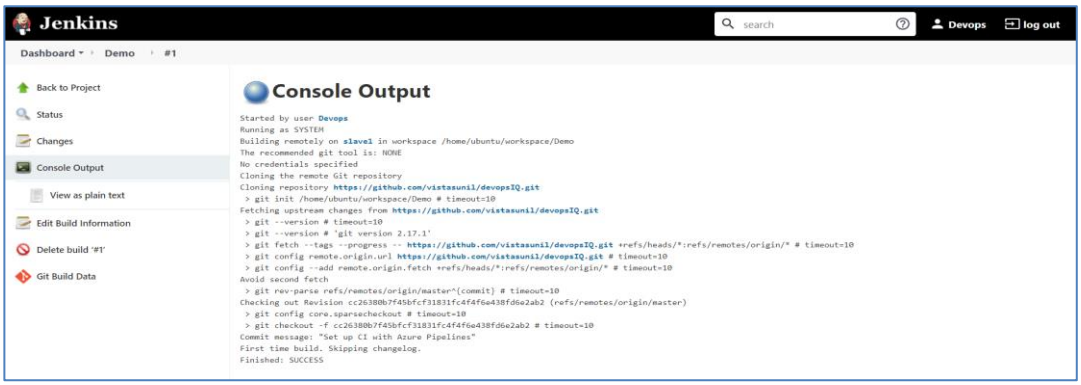


Click on Save.

viii. Click on Build Now, if the building is done without any error there will be blue circle in the building history.



ix. Click on the blue circle of build #1.



You can see it has been built successfully. Let us verify that.

x. Go to slave1.

```
$ ls -ltr
$ cd workspace
$ ls -ltr
$ cd Demo
$ ls -ltr
```

```
ubuntu@slave1:~$ ls -ltr
total 1500
-rw-rw-r-- 1 ubuntu ubuntu 1521553 Feb 12 12:58 agent.jar
-rw-rw-r-- 1 ubuntu ubuntu      65 Feb 12 13:08 secret-file
drwxrwxr-x 3 ubuntu ubuntu    4096 Feb 12 13:08 jenkins
drwxrwxr-x 3 ubuntu ubuntu    4096 Feb 12 13:20 workspace
ubuntu@slave1:~$ cd workspace/
ubuntu@slave1:~/workspace$ ls -ltr
total 4
drwxrwxr-x 4 ubuntu ubuntu 4096 Feb 12 13:20 Demo
ubuntu@slave1:~/workspace$ cd Demo/
ubuntu@slave1:~/workspace/Demo$ ls -ltr
total 11488
-rw-rw-r-- 1 ubuntu ubuntu      462 Feb 12 13:20 azure-pipelines.yml
-rw-rw-r-- 1 ubuntu ubuntu       56 Feb 12 13:20 Dockerfile
drwxrwxr-x 3 ubuntu ubuntu     4096 Feb 12 13:20 devopsIQ
-rwxrwxr-x 1 ubuntu ubuntu 11748168 Feb 12 13:20 docker-compose
ubuntu@slave1:~/workspace/Demo$
```

You can see the repository files there. This means the git repository has been successfully cloned into the Demo job.

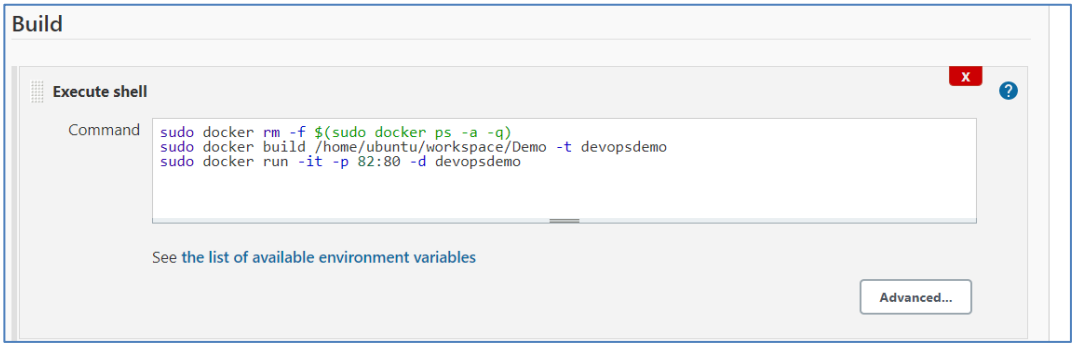
Now we will deploy the website that we have stored in our repository.

xi. To run the Dockerfile we have to check the copy the present working directory.

```
ubuntu@slave1:~/workspace/Demo$ pwd
/home/ubuntu/workspace/Demo
```

xii. Now go back to configuring the job. Click on Build, then go to Execute shell

```
sudo docker rm -f $(sudo docker ps -a -q)
sudo docker build /home/ubuntu/workspace/Demo -t devopsdemo
sudo docker run -it -p 82:80 -d devopsdemo
```



Click on save.

xiii. Before building our job again we must add one arbitrary container in slave1. Add container by performing the following command.

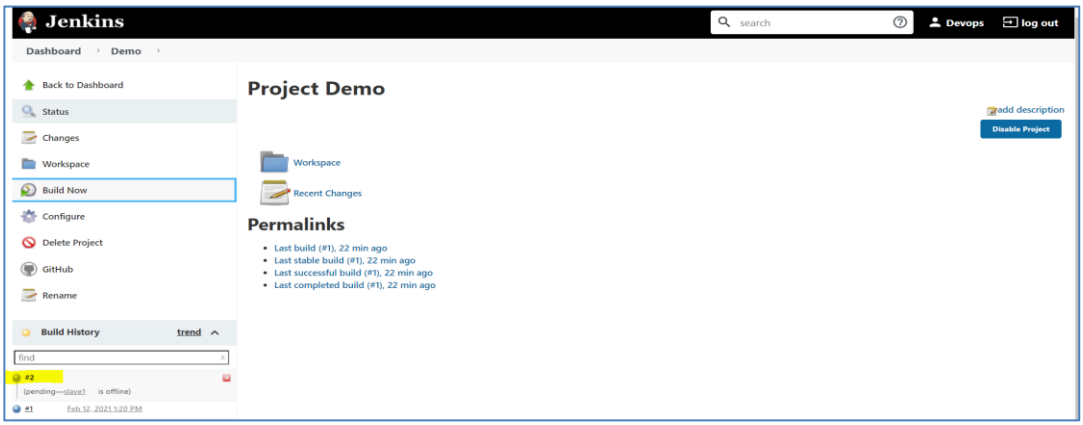
```
$ sudo docker run -it -d ubuntu
```

```
ubuntu@slave1:~/workspace/Demo$ sudo docker run -it -d ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
83ee3a23efb7: Pull complete
db98fc6f11f0: Pull complete
f611acd52c6c: Pull complete
Digest: sha256:703218c0465075f4425e58fac086e09e1de5c340b12976ab9eb8ad26615c3715
Status: Downloaded newer image for ubuntu:latest
472b62d1a51c241cfaa273b34f7abb922436bcb35b2c8c78f75853eaa42dd89c
```

Now we have added a container as below

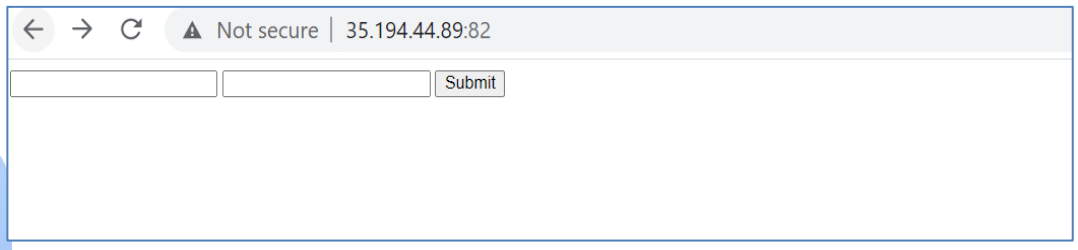
```
ubuntu@slave1:~/workspace/Demo$ sudo docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
472b62d1a51c        ubuntu              "/bin/bash"         24 seconds ago      Up 22 seconds                           cranky_hofstadter
ubuntu@slave1:~/workspace/Demo$
```

xiv. Now open Jenkins Dashboard and build the project.



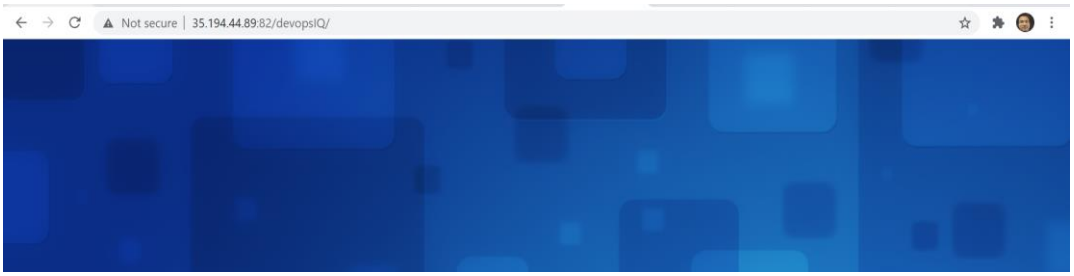
Building was successful.

xv. Now open browser and enter Slave1 Public IP:82. You can get the IP against server name in GCP console



This is the apache page that means our container is working perfectly.

xvi. Now enter slave1 Public IP:82/devopsIQ/ in the browser.



Website is accessible successfully.