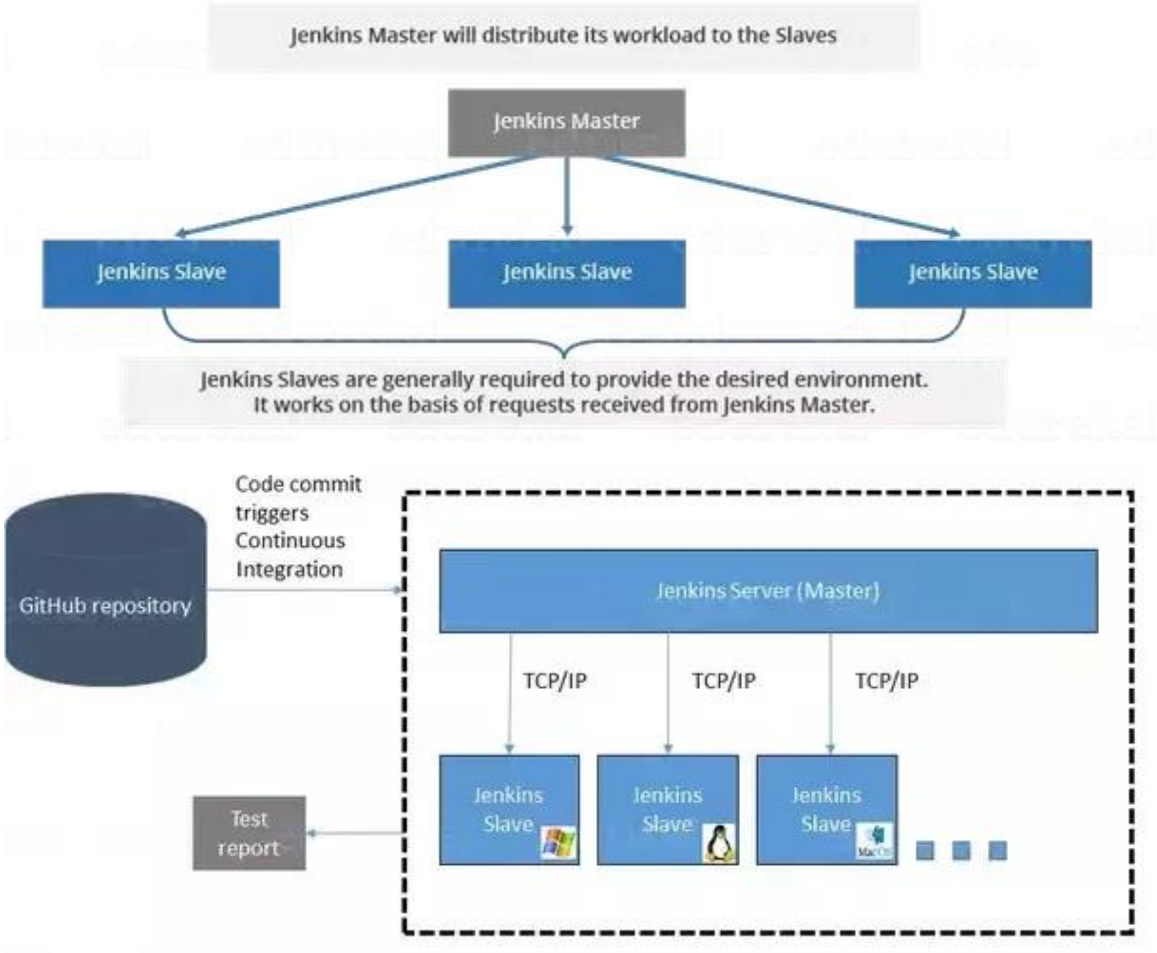
use of master and slave in Jenkins

- Jenkins checks the Git repository at periodic intervals for any changes made in the source code.
- Each builds requires a different testing environment which is not possible for a single Jenkins server. In order to perform testing in different environments Jenkins uses various Slaves as shown in the diagram.
- Jenkins Master requests these Slaves to perform testing and to generate test reports.



Jenkins distributed Architecture

- Jenkins uses a Master Slave architecture to manage the distributed builds
- The Master and slave communicate through Tcp/IP Protocol.

Jenkins Master: Your main Jenkins server is the Master.

- Scheduling build jobs.
- Dispatching builds to the slaves for the actual execution.
- Monitor the slaves (possibly taking them online and offline as required).
- Recording and presenting the build results.
- A Master instance of Jenkins can also execute build jobs directly.

Jenkins Slave: A Slave is a Java executable that runs on a remote machine

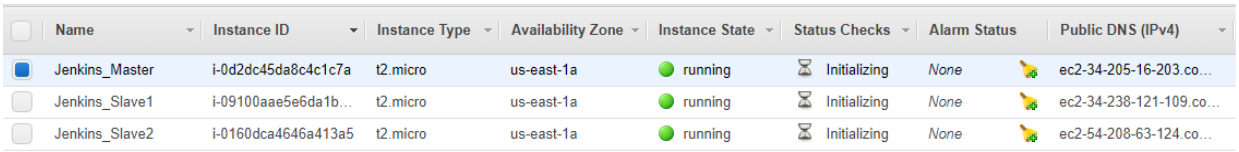
- It hears requests from the Jenkins Master instance.
- Slaves can run on a variety of operating systems.
- The job of a Slave is to do as they are told to, which involves executing build jobs dispatched by the Master.

How to configure Jenkins Master to Slaves/Nodes/Clients

Create 3 instances in AWS which ever you want

I am taking 3 ubuntu instances i.e

1) **Jenkins_Master →Private Ip: 172.31.95.197**
2) **Jenkins_Slave1**
3) **Jenkins_Slave2**



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)
Jenkins_Master	i-0d2dc45da8c4c1c7a	t2.micro	us-east-1a	running	Initializing	None	ec2-34-205-16-203.co...
Jenkins_Slave1	i-09100aae5e6da1b...	t2.micro	us-east-1a	running	Initializing	None	ec2-34-238-121-109.co...
Jenkins_Slave2	i-0160dca4646a413a5	t2.micro	us-east-1a	running	Initializing	None	ec2-54-208-63-124.co...

Install Jenkins on Master -→ Open the Terminal of Jenkins_Master

- **switch user to root → sudo su -**
- **switch user to Jenkins → sudo su – jenkins**
- **now generate sshkey in Master**

```
root@ip-172-31-95-197: ~
root@ip-172-31-95-197:~# sudo su - jenkins
jenkins@ip-172-31-95-197:~$ ssh-keygen                                    Master
Generating public/private rsa key pair.
Enter file in which to save the key (/var/lib/jenkins/.ssh/id_rsa):
Created directory '/var/lib/jenkins/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /var/lib/jenkins/.ssh/id_rsa.
Your public key has been saved in /var/lib/jenkins/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:4cWEn7ZwugnLFCt7KVflwK9G4FuMZRM5WiV/tswyqHY jenkins@ip-172-31-95-197
The key's randomart image is:
+---[RSA 2048]----+
|          .oo.   |
|         .o=o    |
|         .=o+. o |
|       ..+o%. = . |
|        +S%.*o +  |
|     . + =.= oo   |
|      = =o*E.     |
|     o *.+.o      |
|      +   .       |
+----[SHA256]-----+
```

```
+----[SHA256]-----+                                                  Master
jenkins@ip-172-31-95-197:~$ cat /var/lib/jenkins/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDNxJt9nR9k0lZNLjbXC2EzqZfH6oRRTF1lCG2rgu+3a0U7DG12E1JFTXuizivADsO/6QzoDfhhEOkmp3oiCHCV8nADfbeI/ks6z7+qpAjFzbslh8YceL+QyUp5bFy46UHx
SahfubWgb+YL9cnQb+Ati2PMHWvAMaAKR52+riBjEVY+5dgJ5E6mME0XZnBcfAoKSLZO5mwecZU1IVhQ47fFA8eSzU4baJbMbUgPSsWszV0m22iFh/XtPIyL25McmlekzZ5tOiUjzQiTuweretkrnzTRARu0lMeNspMBMDH+
iJlTIC8ryD67MzoY7hqE02QZJbMr3+3D7i69MsMI0nNP jenkins@ip-172-31-95-197
jenkins@ip-172-31-95-197:~$
```

- **copy the public key and paste into the Jenkins_Slave1 and Jenkins_Slave2**

Now open Jenkins_Slave1 terminal

vi .ssh/authorized_keys → esc I, esc o → paste the master public key into this and close esc :wq!

Check is correctly pasted or not → cat .ssh/authorized_keys

```
ubuntu@ip-172-31-83-83:~$ vi .ssh/authorized_keys                    Jenkins_Slave1
ubuntu@ip-172-31-83-83:~$ cat .ssh/authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQChl1lqBVCNgEl7QCIBl3YRNE2SAai9Wr6C+L3iYC09AW5whJEW8skE8sSroGlOnCQFWMuFOm44mT8Xjno9FpOkzzUEYRCC7OqdDkAqxVpqigwYaJv5u+hbF6/hxDmNeufo
gDlupDH3bzkttBAvrI9UBIRprKotUXDqssE7OgdVVIp+4smqdzZpE67mXspm8MAYJLLrkpiE7O33ndEtD2rj/llSxmNsrij5g5WcCKVQrJUH300hlOBczKj5FgwMMMMDlHBRK7b6gAqu9F/WVLXdnBg/7By2ZGD6DZGnjFsh
v5X9druFA/tcg7+LI46DLI74ii9lMDuMfB0lBGB8ledd jenkinsUB
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDNxJt9nR9k0lZNLjbXC2EzqZfH6oRRTF1lCG2rgu+3a0U7DG12E1JFTXuizivADsO/6QzoDfhhEOkmp3oiCHCV8nADfbeI/ks6z7+qpAjFzbslh8YceL+QyUp5bFy46UHx
SahfubWgb+YL9cnQb+Ati2PMHWvAMaAKR52+riBjEVY+5dgJ5E6mME0XZnBcfAoKSLZO5mwecZU1IVhQ47fFA8eSzU4baJbMbUgPSsWszV0m22iFh/XtPIyL25McmlekzZ5tOiUjzQiTuweretkrnzTRARu0lMeNspMBMDH+
iJlTIC8ryD67MzoY7hqE02QZJbMr3+3D7i69MsMI0nNP jenkins@ip-172-31-95-197
ubuntu@ip-172-31-83-83:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 12:5c:b0:01:b1:ce
          inet addr:172.31.83.83  Bcast:172.31.95.255  Mask:255.255.240.0
          inet6 addr: fe80::105c:b0ff:fe01:b1ce/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9001  Metric:1
          RX packets:821 errors:0 dropped:0 overruns:0 frame:0
          TX packets:734 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:330819 (330.8 KB)  TX bytes:107919 (107.9 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:192 errors:0 dropped:0 overruns:0 frame:0
          TX packets:192 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:14456 (14.4 KB)  TX bytes:14456 (14.4 KB)

ubuntu@ip-172-31-83-83:~$
```

Copy the private ip of Jenkins_Slave1 to master for the communication purpose

ssh ubuntu@172.31.83.83

```
jenkins@ip-172-31-95-197:~$ ssh ubuntu@172.31.83.83
Welcome to Ubuntu 16.04.3 LTS (GNU/Linux 4.4.0-1049-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.


Last login: Sat Mar 24 10:22:40 2018 from 106.77.190.213
ubuntu@ip-172-31-83-83:~$
```

Master

Exit form that to master

- **Jenkins is written in Java so if want to connect the Jenkins master java is perquisite so install java in Jenkins_slave1 and also update apt Repo**

sudo apt-get update

sudo apt-get install openjdk-8-jdk

after that create one directory name as Jenkins

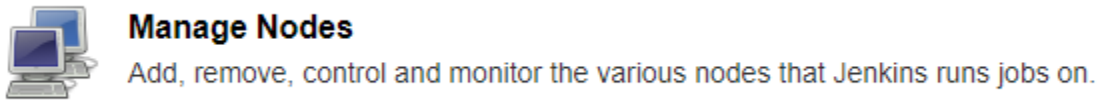
mkdir Jenkins → ls→ cd Jenkins →pwd

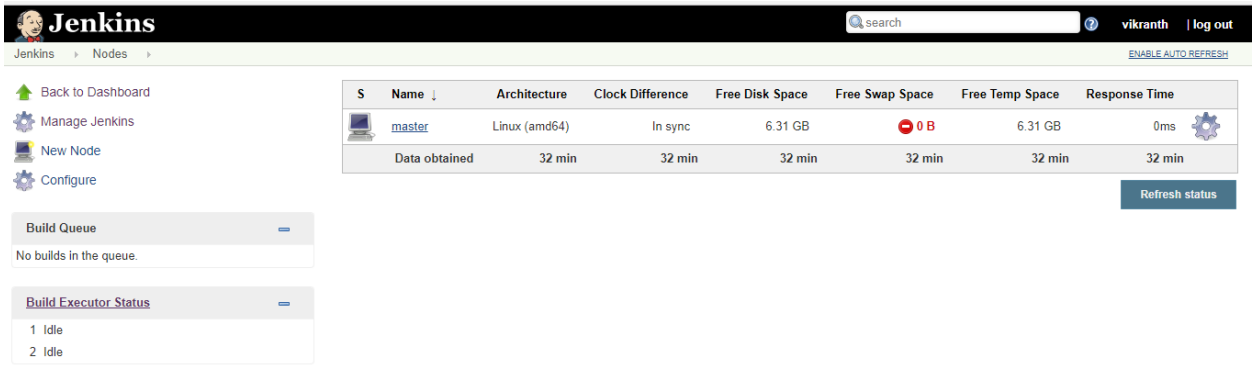
```
ubuntu@ip-172-31-83-83:~$ history
    1  exit
    2  clear
    3  apt-get install openjdk-8-jdk
    4  clear
    5  sudo apt-get update
    6  sudo apt-get install openjdk-8-jdk
    7  history
ubuntu@ip-172-31-83-83:~$ mkdir jenkins
ubuntu@ip-172-31-83-83:~$ ls
jenkins
ubuntu@ip-172-31-83-83:~$ cd jenkins/
ubuntu@ip-172-31-83-83:~/jenkins$ pwd
/home/ubuntu/jenkins
ubuntu@ip-172-31-83-83:~/jenkins$
```

Jenkins_Slave1

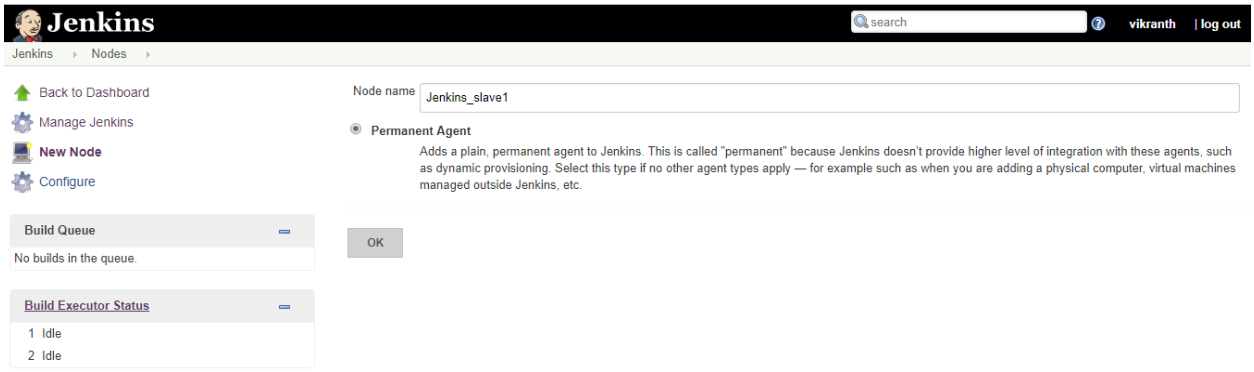
Now go to Jenkins Dashboard → http://54.89.229.86:8080/

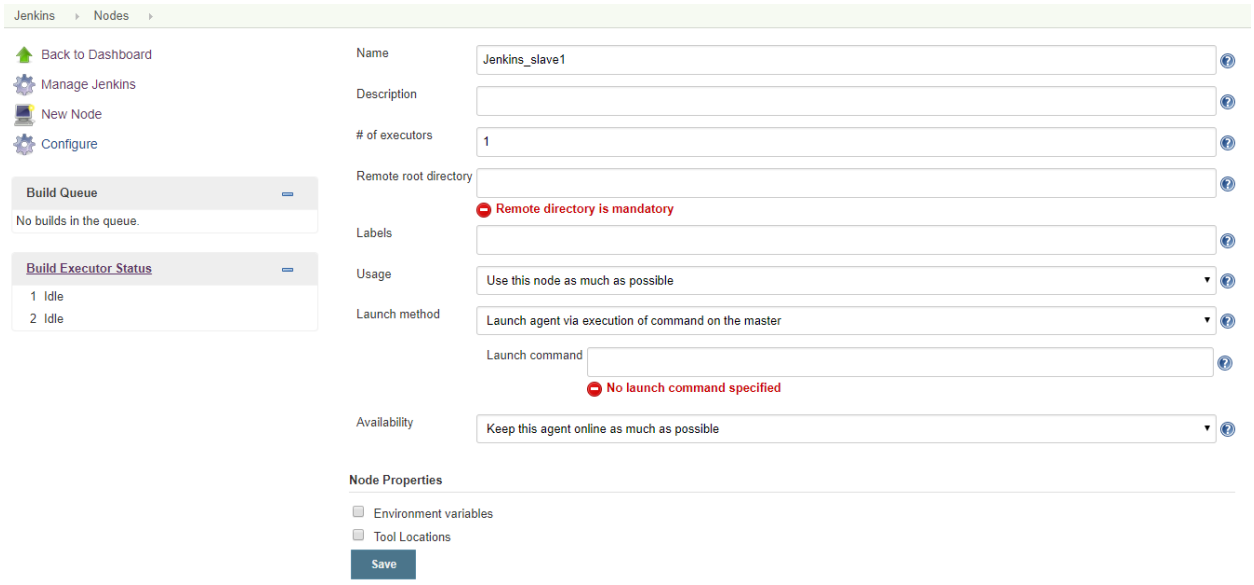
Manage Jenkins→ Manage Nodes→





Click on New Node→ give the node Name and select Permanent→ ok





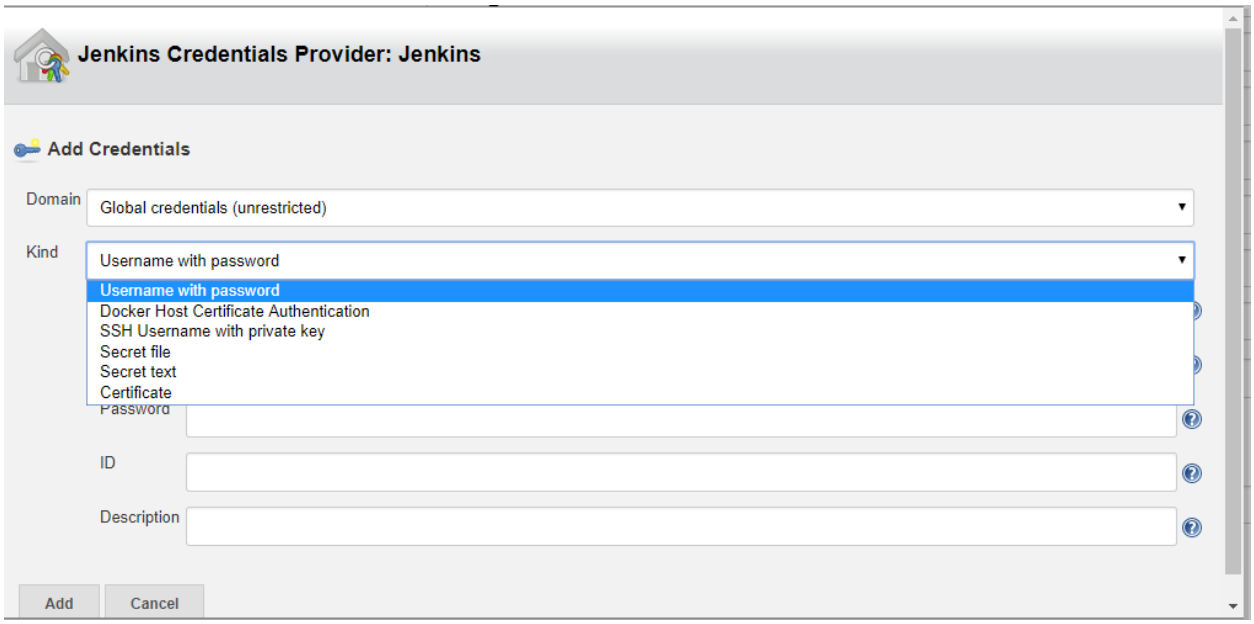
Under Remote root Directory-→ give slave1 home Directory path i.e

/home/ubuntu/Jenkins

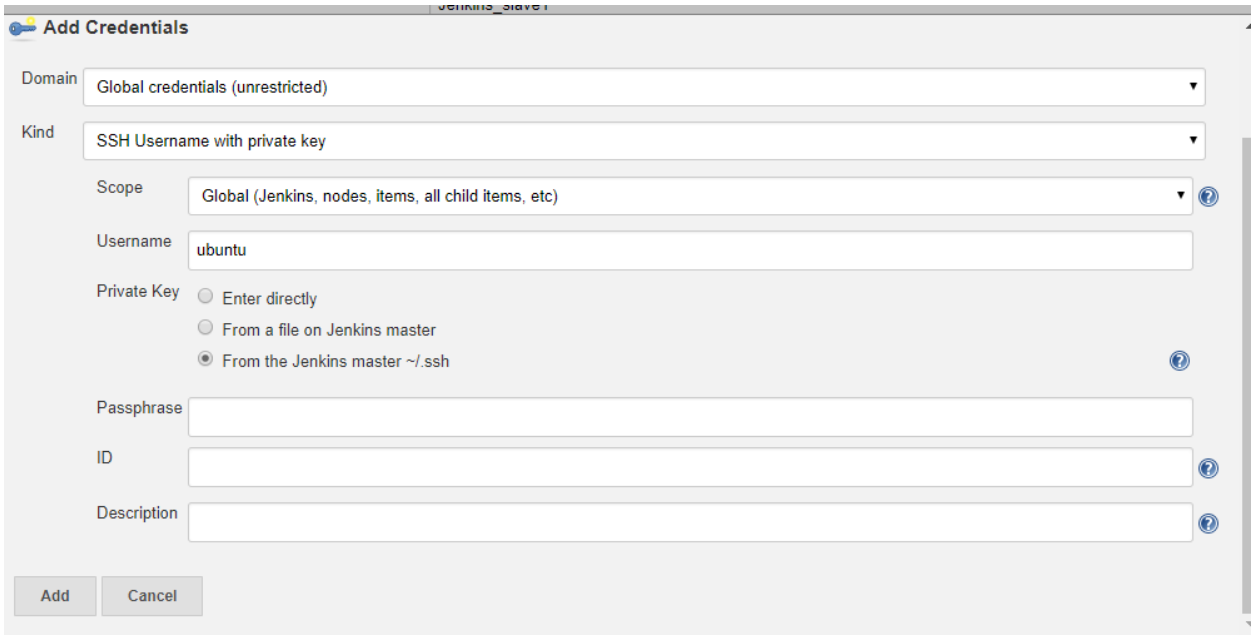
Give the labels as → linux whatever it is

Launch method select the →Launch ssh agents via SSH

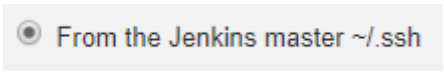
Host → give the private ip of slave1 → 172.31.83.83



Kind→ username with password



User name as →ubuntu

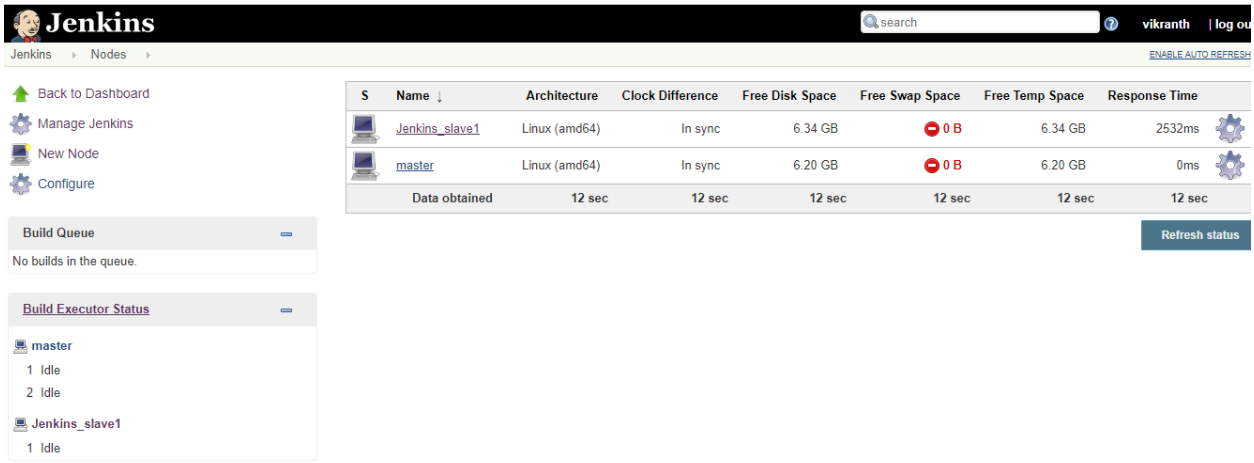
Private key→ 

→ add

Under credentials → take the user name

click on ok

Now click on Jenkins_Slave1→



Now Jenkins_Slave1 added to master successfully

Similarly you can add many number of slaves to ur Master

Now connect slave2 to master

Steps:

- **Copy the ssh public key and paste into the Slave2**
- **Check the communication between master and slave2**
- **Install the java in slave2**
- **Create the directory as Jenkins in slave**
- **on Jenkins dashboard→**

  Manage nodes→

  add node→

  give remote directory as slave home directory → /home/ubuntu/jenkins

labels name -- linux→

Take launch method as → Launch slave agents via SSH

Host → give the slave2 private ip

Click on add → Jenkins→ kind→ SSH Username with private key

User Name → ubuntu

Private key → select From the Jenkins Master ~/.ssh → add

Credentials →

take user name → ubuntu

save

click on launch the slave2

```
ubuntu@ip-172-31-82-254:~$ vi .ssh/authorized_keys
ubuntu@ip-172-31-82-254:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 12:4e:f9:c7:7f:bc
          inet addr:172.31.82.254  Bcast:172.31.95.255  Mask:255.255.240.0
          inet6 addr: fe80::104e:f9ff:fec7:7fbc/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9001  Metric:1
          RX packets:563 errors:0 dropped:0 overruns:0 frame:0
          TX packets:525 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:303801 (303.8 KB)  TX bytes:66875 (66.8 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:192 errors:0 dropped:0 overruns:0 frame:0
          TX packets:192 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:14456 (14.4 KB)  TX bytes:14456 (14.4 KB)
```

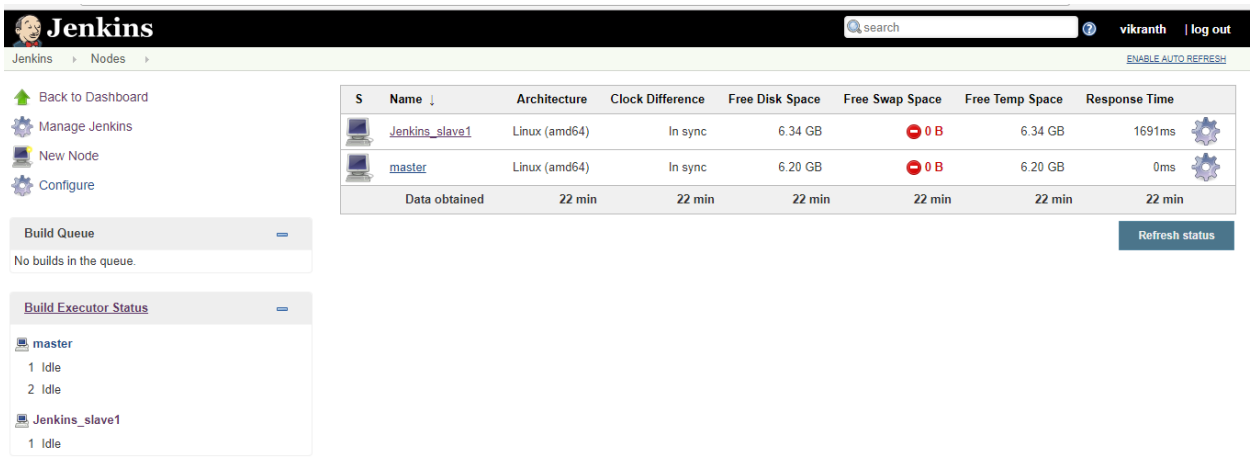
Slave_2

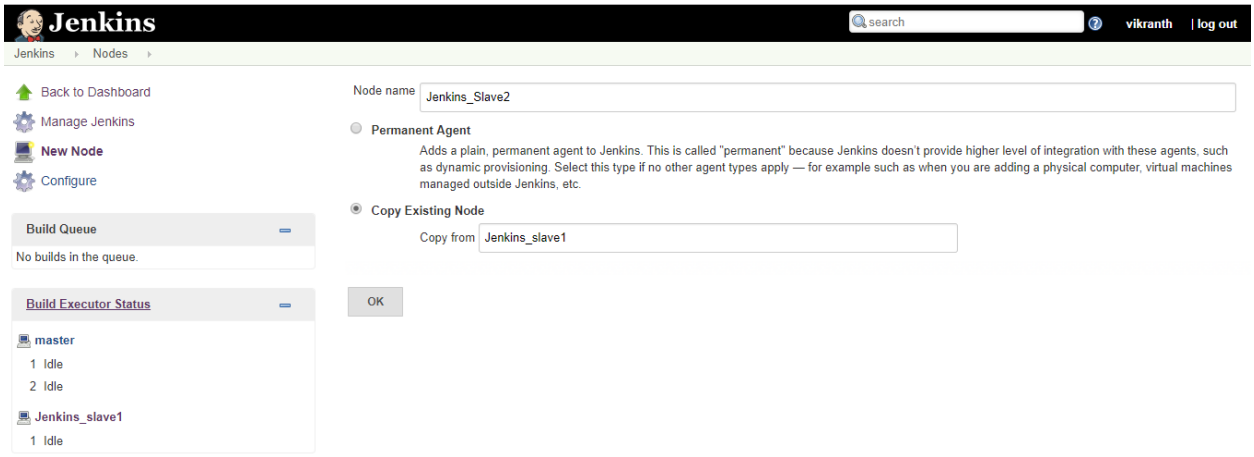
sudo apt-get update

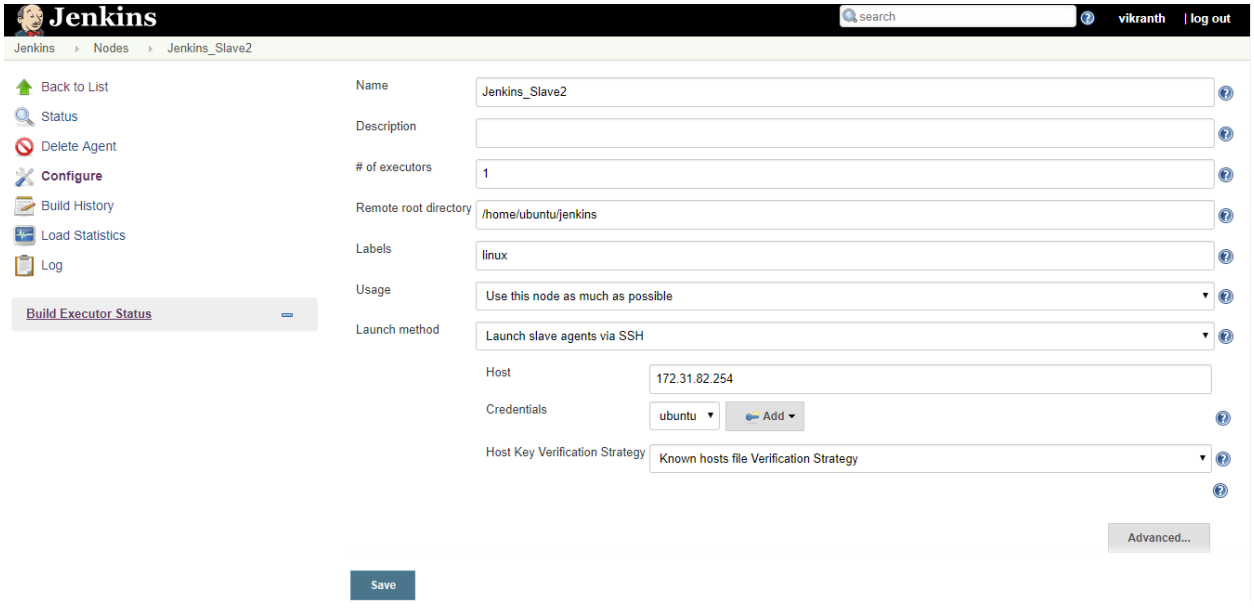
sudo apt-get install openjdk-8-jdk

mkdir Jenkins → /home/ubuntu/Jenkins

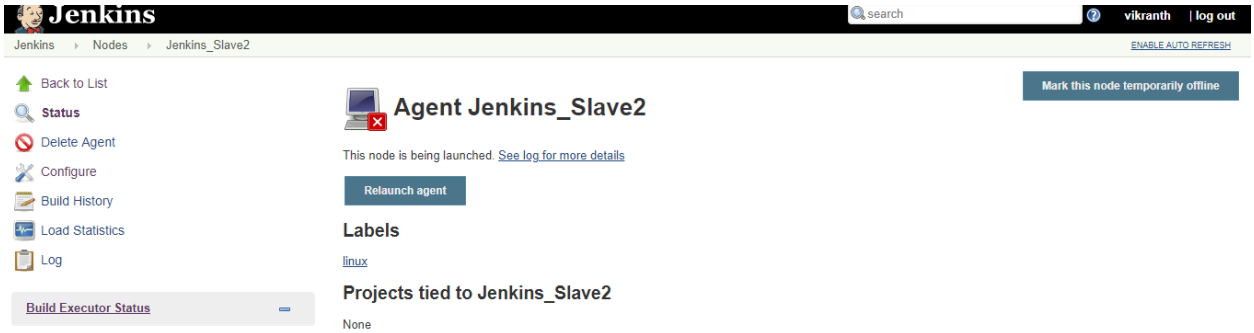
now go to Jenkins dashboard → Manage Jenkins→ Manage Nodes→ New Node







Give the all details and save



Click on Relaunch agent

And go to nodes→