



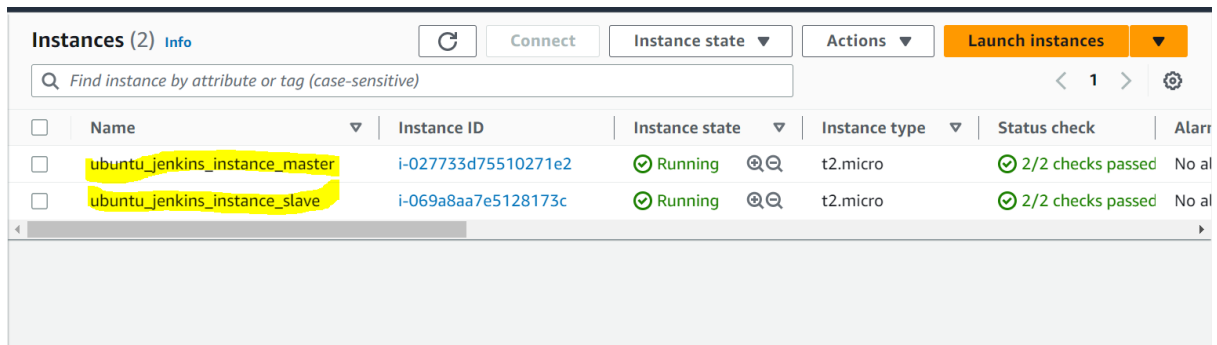
JENKINS MASTER SLAVE ARCHITECTURE HANDSON DEMO

Master Slave architecture

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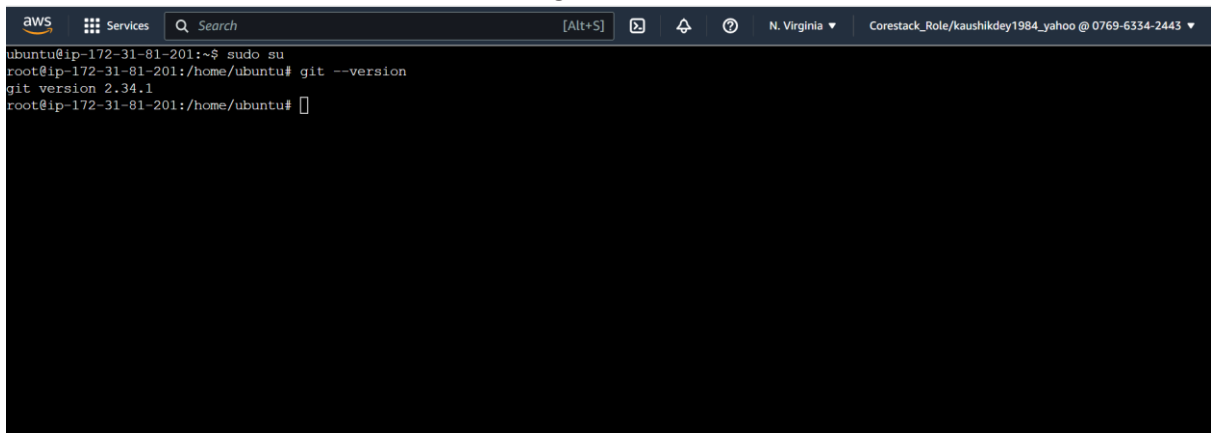
Jenkins Master & Slave architecture

- 1) first, we are going to create two servers (Master and slave). In ec2 we are creating two servers, the screenshot is given below.



	Name	Instance ID	Instance state	Instance type	Status check	Alarm
<input type="checkbox"/>	ubuntu_jenkins_instance_master	i-027733d75510271e2	Running	t2.micro	2/2 checks passed	No alarm
<input type="checkbox"/>	ubuntu_jenkins_instance_slave	i-069a8aa7e5128173c	Running	t2.micro	2/2 checks passed	No alarm

- 2) connect the slave machine, the screen shot is given below.



```
ubuntu@ip-172-31-81-201:~$ sudo su
root@ip-172-31-81-201:/home/ubuntu# git --version
git version 2.34.1
root@ip-172-31-81-201:/home/ubuntu#
```

Install java OpenJDK, GIT, MAVEN on Ubuntu Slave Machine:

- 3) we can see that git is installed by default. Now we are going to install another pre-requisite in slave machine.
- 4) If git is not present or any other distribution does not present so install. In case if git is not present in this system, we can add `sudo apt install git -y`.
- 5) Now in slave machine add below commands one after another.

Code updation in slave system:

- ✓ `sudo apt update`
- ✓ `sudo apt install openjdk-11-jre`
- ✓ `java -version`
- ✓ `sudo apt install maven -y [installing built tool]`
- ✓ `mvn -version`
- ✓ `/usr/lib/jvm/java-11-openjdk-amd64 [default path]`

- 6) Establish a connection between master and slave. so that why need one user, user credentials.

Jenkins Master & Slave architecture

7) Adding a New User for Slave :

```
root@ip-172-31-81-201:/home/ubuntu# useradd -m -s /bin/bash devopsadmin1
root@ip-172-31-81-201:/home/ubuntu# su - devopsadmin1
root@ip-172-31-81-201:/home/ubuntu# ls
devopsadmin1@ip-172-31-81-201:~$ ls
devopsadmin1@ip-172-31-81-201:~$ pwd
/home/devopsadmin1
devopsadmin1@ip-172-31-81-201:~$ ls -a [ there is no ssh key generated]
. .. .bash_logout .bashrc .profile
devopsadmin1@ip-172-31-81-201:~$ rm -rf .ssh/
devopsadmin1@ip-172-31-81-201:~$ ssh-keygen -t rsa -b 4096 -m PEM
Generating public/private rsa key pair.
Enter file in which to save the key (/home/devopsadmin1/.ssh/id_rsa):
Created directory '/home/devopsadmin1/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/devopsadmin1/.ssh/id_rsa
Your public key has been saved in /home/devopsadmin1/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:Oq7FVsZjTfuWq6PROVUxMMAYB+BsOyob33JOy1v2FBo devopsadmin1@ip-
172-31-81-201
The key's randomart image is:
+---[RSA 3072]-----+
|  ..o=o.o.o  |
|   o ... . o  |
|    +   . .   |
|   . o o . .   |
|    o E + .   |
|    o * = = .   |
|   o . B = = +   |
|   =.B.= +.o .   |
|   . o=B...oo.   |
+---[SHA256]-----+
devopsadmin1@ip-172-31-81-201:~$ ls -a
. .. .bash_logout .bashrc .profile .ssh
devopsadmin1@ip-172-31-81-201:~$ ls -a
. .. .bash_logout .bashrc .profile .ssh
devopsadmin1@ip-172-31-81-201:~$ cd .ssh
devopsadmin1@ip-172-31-81-201:~/ssh$ ls
id_rsa id_rsa.pub
devopsadmin1@ip-172-31-81-201:~/ssh$ cat id_rsa
-----BEGIN OPENSSH PRIVATE KEY-----
b3BlbnNzaC1rZXktdjEAAAABG5vbmUAAAABbm9uZQAAAAAAAAABAAABlwAAAAdz
c2gtcn
```

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NhAAAAAwEAAQAAAYEAty7OjEWoLTljpUzYBvORM/eawFgAVQj+Gv0rrYh1VIH9mYM
iuZqH
a3tNLdJqkswa+pkXNFasX9df6Htn7rp0FqT4ZRIw54rR5vJ4DPyeBLpd/wC4uMDLkVDus
m
Ifd9FYziX34nCbtZNbmErLYPaSA/xPH7cPtgBOsDPbQFynJb2Kily4CbM5sfts9VrXN8E
SfqZhPhBKTNDlwGFVzgbMrAy1XozH5wsllc0rXmyOTHK8f/+JbpbFPNTHvI59YrEeddKU
z
ffkueWOKLuTwevZKsM6dJFivAuQ8OIUE2R2usFkBTGcFrAyOsuSnUkLPGC1TW84Zsf1c
Gb
FscijP8kO3cRhDsdCyR/w9nAvngBJKFODr+1fHtPTtfRZWpEbKxfBwgz1L5ADN1XWaBUS
2
Ic34HyxW2tXu8vFxPeLEjEWxcU+mSZYKTbdtD6L6edxfvIEGRT05gcEzTb52j9gKyds1u
KklilyFcpBVnNFwq4DpYbl114dQer792Aepy+53tAAAFmBecbQMxNG0DAAAAB3NzaC
1yc2
EAAAGBALcuzoxFqC0yl6VM2AbzkTP3msBYAFUI/hr9K62IdVSB/ZmDIrmah2t7TS3SapL
M
GvqZFzRWrf/XX+h7Z+66dBak+GUSMOeK0ebyeAz8ngS6Xf8AuLjAy5FQ7rJpRXfRWM4
I9+
Jwm08zW5hKy2D2kgP8Tx+3D7YATrAz20BcpyW9iiJcuAmzObH7bMvVa1zfBEn6mYT4
QSkz
XZcBhVc4GzKwMtV6Mx+cLJZXNK15sjkxyvH//iW6WxTzUx75efWKxHnXSlM335LnIjii7k
8Hr2SrDOnSRYrwLkPDpVBNkdrBZAUxnBawMjrLkp1JCzxtU1vOGbH9XBmxbHloz/JD
t3
EYQ7HXMkf8PZwL54ASShTg6/tXx7T07X0WVqRG5MXwclM9S+QAzdV1mgVEtiHN+B8
sVtrV
7vLxcT3ixlxFsXFPpkmWck23bQ+i+nncX7yBAoEU9OYHBM02+do/YCsnbNbipClpchXK
QV
ZzRcKuA6WGyNdeHUHq+/dgHqcvud7QAAAAMBAAEAAAGAQWITlz3FqVwcHQQwl0q
YqVPXiI
/gjnMHOVrkHCx4tJExU3nbCyR88YAxLANOwFbZyIiaT7QgEpVtRi3GCw/CH9MCVhEI50
J
DsW80+XXARkEM+CuDkPCZTvd9xBcG0g9ylcDA2/t/3b1WoZX0WQw+fs0wr00fmHdtE
bOGO
r23iGpDFrL1aqDDWQQkTC8AYoYnc80vKFfoLUU0rFYRqlgC9eYTVowpTe5MnAt/T1Sv9
dl
+LrGm/DIUdIH+SZSwbGlk6XwkVRb0wE5ibtRPyvwPMn1cME8+ZVcnesVmHFu0+tT9W
JSDW
fINy2LMk7SJi+Ywvnf0E2wyCOlsZAK2tHZD6WaPE7Op17yTlnliWx4cbsU5V8/3q1dwYm
I
FDS5VNjdIOScitfF2kIOQSHS6D++PmWBRAymt4CmxmtgH+pYSzgK01yBFRmLPIBjSPR
WrK
o6pKgD7MjBzMTI9KOIGSYS4HTwZlOUG8XpGjAOTRkoPjeJwEcvQ8+XuMOQumZPvaB
AAAA

Jenkins Master & Slave architecture

```
wGlCbyleCJO003uzA7Lu157PkNqGmDzsxY8nEIEYCn6CwLydHqYPfg0r1izD4PdFTDgs
DW
GmTpXjf4TxLKVFf3PqEiNcrfQUBCYL2rYM6Y2hTUSfla9S3kctjQhpnmJMAS7DycG07qgx
tsSfnDY2H9i54z9juW9WIC/48+Jm4K52SK3dEw0xYseac5u9r61Z3VigZ72NtFC1Vur4J4
of7DCqqSq0PiotGvHSWqiOUHHCxmaXBgw2at1GE4EcvPxfXwAAAMEAwCoa97fP8CU
hUI5x
yOpG4I0fvyYs9qSDybCrcyY6kuztcjIPTvxhTPK43zSzycUIh68LNDq/cPv93P7YIkkvz1
0h6KfQ4N1ikRFifbnNONyBH9gSYpsKPDWUAs8un2YZh0jjB2nn8qSzMk2ZHXjCQkx+0V
kj
JOkewMnEu1I3QwllpcH7gLuyj7tFuO1h+YwNhYtwvsWdXFZBdU3d92JdVGnuz3XQW
pi7X
8tNV266QxDc6mxKH6WKUKnOsLn48qfAAAawQD0COSCUBcmSz/mCg6eqPi0gjxe9H
Av76tR
BA3JdxuwEUTvYunTVtCcVZZXAVpx3P4gfvWBc/nIEtuuKa/bg07CRDPgd4NPlwewuRd5
oR
2HC9HUxOjQic7j+gk6t6djiZ7X+tpDefvNFu2pbG1S1EVFndFaib2pTuzjkt7VW37ZkSFj
AYZmFX0MOW6G0kUJMYeUWZZGfuev12Nfi4uyNBZfmmihTH7BMNiUnNRqSEnpli4Z
0Adlb9
IEoiLDCoSyF/MAAAAdZGV2b3BzYWRtaW4xQGllwLTE3Mi0zMS04MS0yMDEBAgMEBQ
Y=
```

-----END OPENSSH PRIVATE KEY-----

[devopsadmin1@ip-172-31-81-201:~/.ssh\\$](#)

this private key we have to configure in my master node.

#You should see following two files:

#id_rsa - private key

#id_rsa.pub - public

#cat id_rsa & copy the private key and paste it into jenkins node config. enter private key directly field. Then,

[devopsadmin1@ip-172-31-81-201:~/.ssh\\$](#) cat id_rsa.pub > authorized_keys

[devopsadmin1@ip-172-31-81-201:~/.ssh\\$](#) ls

authorized_keys id_rsa id_rsa.pub

[devopsadmin1@ip-172-31-81-201:~/.ssh\\$](#) ll

total 20

drwx----- 2 devopsadmin1 devopsadmin1 4096 Apr 23 11:38 ./

drwxr-x--- 3 devopsadmin1 devopsadmin1 4096 Apr 23 11:30 ../

-rw-rw-r-- 1 devopsadmin1 devopsadmin1 583 Apr 23 11:38 authorized_keys

-rw----- 1 devopsadmin1 devopsadmin1 2622 Apr 23 11:30 id_rsa

-rw-r--r-- 1 devopsadmin1 devopsadmin1 583 Apr 23 11:30 id_rsa.pub

[devopsadmin1@ip-172-31-81-201:~/.ssh\\$](#) chown -R devopsadmin1

/home/devopsadmin1/.ssh

chmod 600 /home/devopsadmin1/.ssh/authorized_keys

chmod 700 /home/devopsadmin1/.ssh




Jenkins Master & Slave architecture

step 8: Add this slave node to jenkins master.

So first we have to go inside the master node , then we have to go manage jenkins and add our new node, the screenshot is given below.

Manage nodes and clouds

+ New Node

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	Built-In Node	Linux (amd64)	In sync	4.79 GB	 0 B	4.79 GB	0ms 
	Data obtained	12 min	12 min	12 min	12 min	12 min	12 min

Dashboard > Manage Jenkins > Nodes > New node

New node

Node name

slave_machine_1

Type



Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

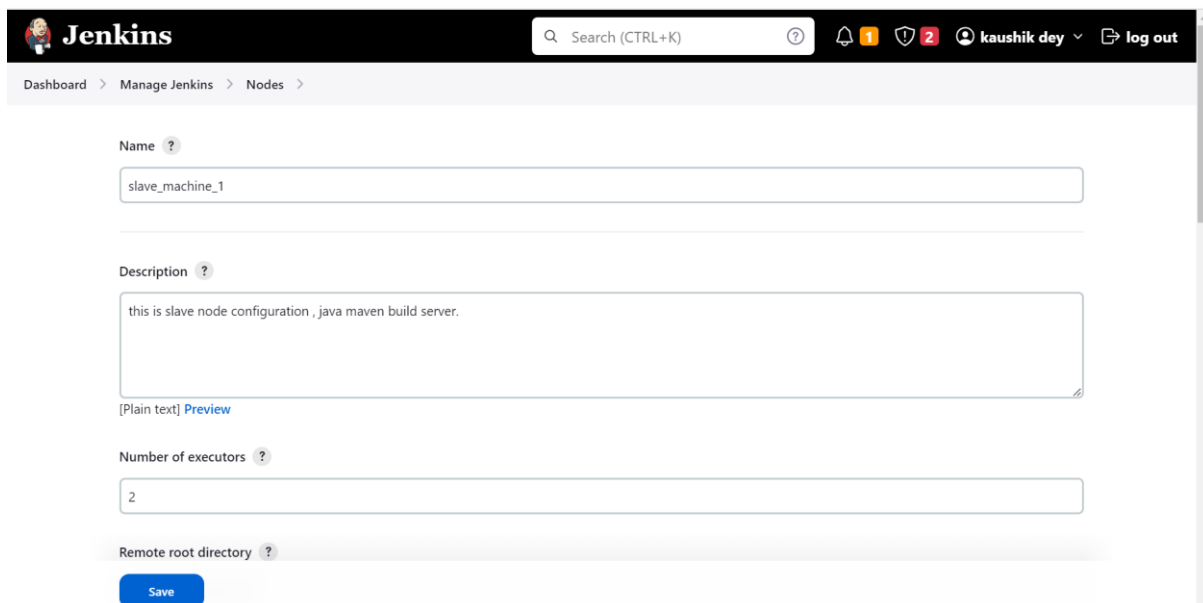
Create

Jenkins Master & Slave architecture

Step 9 :

The node configuration settings are given below.

```
{  
  "Name" : " slave_machine_1",  
  "Description": "this is slave node configuration, java maven build server.",  
  "Number of executors": 2,  
  "Remote root directory": "/home/devopsadmin1"  
  note : slave machine directory  
  "Labels": "slave1"  
  
  Note : Labels are very important for identifying slave machine ",  
  "Launch method" : "Launch agent via SSH",  
  "Host" : 172.31.81.201 ( private ip of this slave node ),  
  "Credentials": devopsadmin1(it is just a credentials)  
  using jenkins credentials provider  
}
```



The screenshot shows the Jenkins web interface for configuring a new node. The top navigation bar includes the Jenkins logo, a search bar, and user information (kaushik dey). The breadcrumb trail is Dashboard > Manage Jenkins > Nodes. The configuration form has the following fields:

- Name**: slave_machine_1
- Description**: this is slave node configuration , java maven build server. (with a [Plain text] Preview link)
- Number of executors**: 2
- Remote root directory**: (empty field)

A blue **Save** button is located at the bottom of the form.

Host key verification settings are given below.

Jenkins Master & Slave architecture

Host ?

172.31.81.201

Credentials ?

devopsadmin1 (this is just description.)

Add ▾

Host Key Verification Strategy ?

Manually trusted key Verification Strategy

☒ Require manual verification of initial connection ?

Step 10 :

Show the Jenkins nodes dashboard

Manage nodes and clouds

[+ New Node](#)

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	Built-In Node	Linux (amd64)	In sync	4.95 GB	0 B	4.95 GB	0ms
	slavenode1	Linux (amd64)	In sync	5.45 GB	0 B	5.45 GB	27ms
Data obtained		1.2 sec	1.2 sec	1.2 sec	1.2 sec	1.2 sec	1.2 sec

And the console output in slave machine.

Dashboard > Manage Jenkins > Nodes > slavenode1 > Log

```
[04/24/23 03:06:48] [SSH] Starting agent process: cd "/home/devopsadmin1" && java -jar remoting.jar -workDir
/home/devopsadmin1 -jar-cache /home/devopsadmin1/remoting/jarCache
Apr 24, 2023 3:06:48 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/devopsadmin1/remoting as a remoting work directory
Apr 24, 2023 3:06:48 AM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /home/devopsadmin1/remoting
<===[JENKINS REMOTING CAPACITY]===>channel started
Remoting version: 3107.v665000b_51092
Launcher: SSHLauncher
Communication Protocol: Standard in/out
This is a Unix agent
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by jenkins.slaves.StandardOutputSwapper$ChannelSwapper to constructor
java.io.FileDescriptor(int)
WARNING: Please consider reporting this to the maintainers of jenkins.slaves.StandardOutputSwapper$ChannelSwapper
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
Evacuated stdout
Agent successfully connected and online
```