Created on: 27/06/24. **Version:** 1.0

Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

JENKINS MASTER NODE AND SLAVE/WORKER NODE CONFIGURATION IN LINUX (UBUNTU 20.04)

Pre-Requisites

- Resource Group.
 - Virtual Network.
 - ➤ Virtual Machines 02 No's. (Master Node and Worker Node)

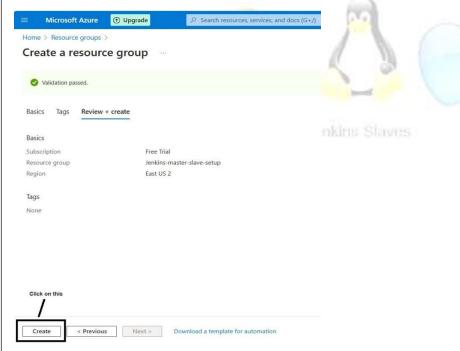
Process Flow at a Glance

- > Resource Group creation
 - Virtual Network creation (For Launching VM's)
 - Network Security Group (Allow ports in inbound rules as mentioned below)
 - Virtual Machines 02 No's (Master Node and Slave/Worker Node) creation
 - Virtual Machine (Master Node) setup
 - For Master Node Allow port numbers 22 and 8080 in NSG.
 - Java Installation. (To install Jenkins, Java is mandatory)
 - Jenkins Installation.
 - Virtual Machine (Slave/Worker Node) setup
 - For Slave/Worker Node Allow port number 22.
 - Java Installation. (Only Java is enough)
 - Establishing a connection between Master and slave/worker Node.

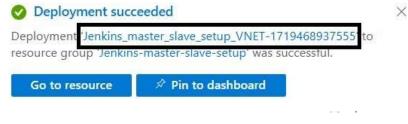
Note: The step-by-step process flow is mentioned below with a proper description and screenshot.

In Microsoft Azure, to create any resources first of all we have to create a Resource group.

1. Resource Group Creation



Author: Anil Kumar Mannem. E-Mail ID: mannemanilkumar@hotmail.com **Created on:** 27/06/24. Version: 1.0 Cloud: Microsoft Azure. **URL**: https://portal.azure.com/ Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu). -----After clicking on Create button, resource group will be created. Which we can see in notifications. Resource group created Creating resource group 'Jenkins-master-slave-setup in subscription 'Free Trial' succeeded. Go to resource group Pin to dashboard a few seconds ago 1.1 Virtual Network Creation Microsoft Azure ① Upgrade P Search resources, services, and doc Home > Virtual networks > Create virtual network Basics Security IP addresses Review + create View automation template Basics Subscription Free Trial Resource Group Jenkins-master-slave-setup Name Jenkins_master_slave_setup_VNET Region East US 2 Security Azure Bastion Disabled Azure Firewall Disabled Azure DDoS Network Protection Disabled IP addresses 10.0.0.0/16 (65,536 addresses) Address space Subnet default (10.0.0.0/24) (256 addresses) Click on this Previous After clicking on Create button, Virtual network will be created. Which we can see in notifications. Deployment succeeded Deployment 'Jenkins_master_slave_setup_VNET-1719468937555'

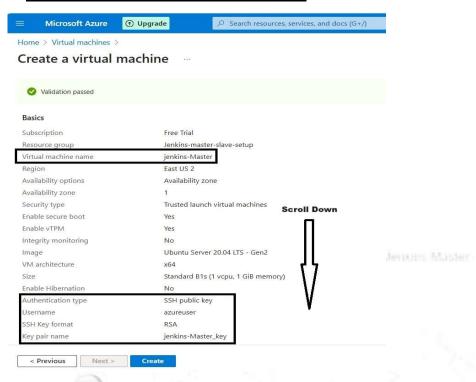


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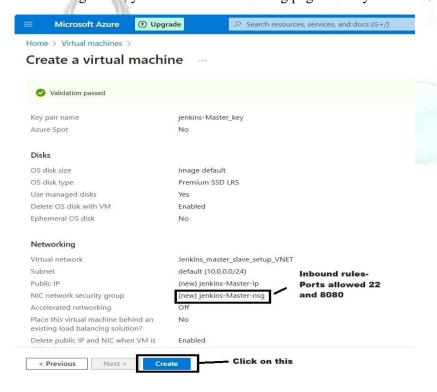
Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

1.2 Virtual Machine Creation (Jenkins-Master)



After scrolling down, you will see the following page. Finally click on **create** button.



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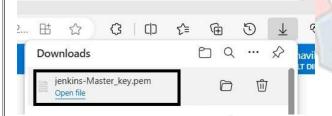
Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

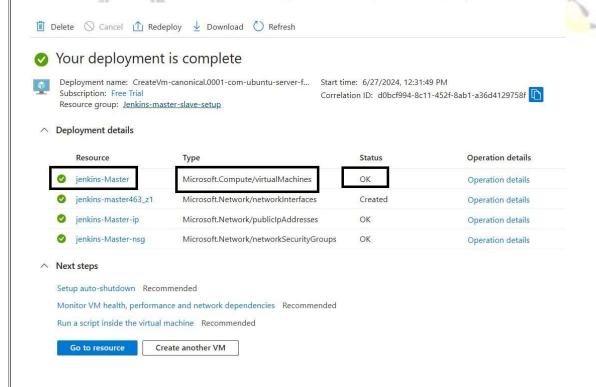
After clicking on **create** button, the following screen will be appeared for downloading key-pair.



We can find the downloaded key in our local system.



After clicking on **Download private key and create resource** button, the following screen will appear.



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Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

....

We have created a virtual machine for Jenkins master in Microsoft Azure, same process has to be followed for creating Jenkins Slave/worker node. (Again, we have to follow the procedure mention in 1.2 <u>Virtual Machine Creation (page-3)</u>- virtual machine name is different). But need to select **SSH public key source** as **Use existing key stored in Azure** and select the stored key name - **jenkins-Master_key**. Which we had created earlier.

Now, we have done with pre-requisites setup (RG, VNET and VM -02 No's Created) and it's time to move to further process.

Configuration of Jenkins Master Node and Slave/Worker Node.

Initially, ensure that SSH (22) and JENKINS (8080) ports was allowed in inbound rules of NSG and connect to your Jenkins-Master server for installing the Java and Jenkins software's as mentioned below.

Pre-Requisites for Accessing the Server

- 1. Public IP Address (We can find it Microsoft Azure portal -- VM overview option)
- 2. User Name (While creating VM we can setup, please refer page-3)
- 3. .pem key or Password (Please refer page-3 and page-4, key available in downloads folder)

In **PowerShell** or **Linux terminal** (If trying to connect through virtual box Linux OS) execute the following command where the .pem file is available. (In my case it is available in downloads folder as shown below)



ssh -i .\jenkins-Master_key.pem azureuser@172.200.217.126

After executing the above command, we can login to that server and screen seems as shown below.

```
PS C:\Users\manne\Downloads> <mark>ssh</mark> -i .\jenkins-Master_key.pem azureuser@172.200.217
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1064-azure x86_64)
    Documentation: https://help.ubuntu.com
Management: https://landscape.canonical.com
https://ubuntu.com/pro
 System information as of Thu Jun 27 10:31:29 UTC 2024
   System load: 0.0
                                                 Processes:
                                                                                        103
                       5.8% of 28.89GB Users logged in: 0
32% IPv4 address for eth0: 10.0.0.4
   Usage of /:
   Memory usage: 32%
Swap usage: 0%
 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s just raised the bar for easy, resilient and secure K8s cluster deployment.
    https://ubuntu.com/engage/secure-kubernetes-at-the-edge
Expanded Security Maintenance for Applications is not enabled.
13 updates can be applied immediately.
To see these additional updates run: apt list --upgradable
Enable ESM Apps to receive additional future security updates. See https://ubuntu.com/esm or run: sudo pro status
New release '22.04.3 LTS' available
Run 'do-release-upgrade' to upgrade to it.
Last login: Thu Jun 27 10:26:34 2024 from 183.83.38.142
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
azureuser@ienkins-Master:~$
```

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Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

To install Jenkins automatically download the shell script from my GitHub. To download it execute the following command in your terminal.

wget https://raw.githubusercontent.com/mannem302/shell scripts/main/devops tools.sh

After executing the above command, devops_tools.sh file will be downloaded in your server and then we have run that script by using the following command.

bash devops_tools.sh

Finally, after executing the above command the following screen will appear. For installing Jenkins. We have to enter Jenkins (Not case sensitive) / 6 as shown in below screenshot.

```
azureuser@jenkins-Master:~$ bash devops_tools.sh
Author: Anil Kumar Mannem.
Below mentioned tool/Software can be installed individually as per your choice
1) Git
                     8) Tomcat
2) Java
                     9) Ansible
3) Maven
                    10) Terraform
4) Grafana
                    11) SonarOube
                    12) Prometheus
Jenkins
                    13) Node_Exporter
                    14) Kubernetes
Now you can install any devops tools/softwares by entering their name(Not case-sensitive) or serial number from the above list:6
```

After entering name / Number. Click on **enter** key, the following screen will appear.

```
Now you can install any devons tools/softwares by entering their name(Not case-sensitive) or serial number from the above list:6
You have entered jenkins
Now jenkins will be installed
--2024-06-27 11:00:36-- https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
Resolving pkg.jenkins.io (pkg.jenkins.io)... 146.75.38.133, 2a04:4e42:79::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)|146.75.38.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3175 (3.1K) [application/pgp-keys]
Saving to: '/usr/share/keyrings/jenkins-keyring.asc'
```

Finally, you will get the **Jenkins URL**, **Port number** and **Initial Admin password** as shown below.

```
Please wait process is going on..
#########
            % Received % Xferd Average Speed
 % Total
                                               Time
                                                       Time
                                                               Time Current
                               Dload Upload
                                                               Left Speed
                                                       Spent
100
     589
                589
                       0
                            0
                                1673
                                          0 -
                                              :--:--
                                                       :--:-
                                                               - : --- : -
                                                                       1673
            % Received % Xferd Average Speed
 % Total
                                               Time
                                                       Time
                                                                Time Current
                               Dload Upload
                                                               Left Speed
                                               Total
                                                       Spent
100
     589
            0
                589
                       0
                             0 58900
                                          0 --:--:- 58900
Open your browser and Enter http://172.200.217.126 and port number is 8080
You have to execute like this in your browser http://172.200.217.126:8080
```

```
b43f4ae118c14e1aaeb6f197e291fc49
```

Copy the above displayed password and paste it in the 'Administrator password' field in your browser azureuser@jenkins-Master:~\$ |

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Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

Open a web browser with the above URL and copy the above password paste it in the browser.

For manual installation process, please refer the following document (Page1 to Page8). Copy the link and paste it in your browser.

 $\frac{https://github.com/mannem302/documents/blob/main/Web\%20Application\%20(Jenkins\%2CTomcat)}{\%2CSonarqube\%20and\%20Jfrog).pdf}$

Jenkins-Slave Node Configuration

Initially, ensure that **SSH** (22) port was allowed in inbound rules of **NSG** and connect to your Jenkins-Slave server for installing the Java as mentioned below.

Follow the same procedure for connecting to Jenkins-slave server as like Jenkins-master server (page 5 & 6)

Note: Same key-pair was used for Jenkins-master node and Jenkins-slave node

But After shell script execution, select the java and click on enter.

```
Author: Anil Kumar Mannem.

Below mentioned tool/Software can be installed individually as per your choice

1) Git 8) Tomcat

2) Java 9) Ansible

3) Maven 10) Terraform

4) Grafana 11) SonarQube

5) Docker 12) Prometheus

6) Jenkins 13) Node_Exporter

7) Jfrog 14) Kubernetes

For installation of Git tool you can pass the inputs like - git / Git / GIT / 1 (As per your convenience)

Now you can install any devops tools/softwares by entering their name(Not case-sensitive) or serial number from the above list:2
```

Java Installation under progress, as mentioned in below screenshot.

```
For installation of Git tool you can pass the inputs like - git / Git / GIT / 1 (As per your convenience)

Now you can install any devops tools/softwares by entering their name(Not case-sensitive) or serial number from the above list:2

You have entered java

Now java will be installed

Hit:1 http://azure.archive.ubuntu.com/ubuntu focal InRelease

Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
```

After successful installation of Java, the screen will appear.

```
Processing triggers for systemd (245.4-4ubuntu3.23) ...

Processing triggers for man-db (2.9.1-1) ...

Processing triggers for libadk-pixbuf2.0-0:amd64 (2.40.0+dfsg-3ubuntu0.5) ...

Java was installed sucessfully and it's Version is:

openjdk 17.0.11 2024-04-16

OpenJDK Runtime Environment (build 17.0.11+9-Ubuntu-120.04.2)

OpenJDK 64-Bit Server VM (build 17.0.11+9-Ubuntu-120.04.2, mixed mode, sharing)

azureuser@Jenkins-slave:~$
```

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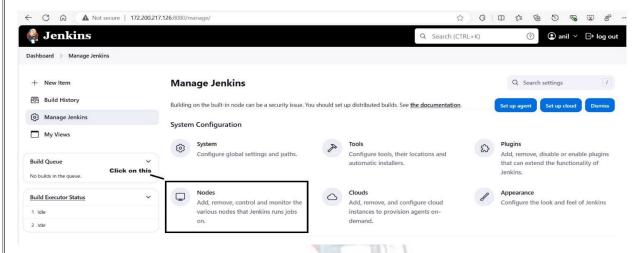
Cloud: Microsoft Azure.

URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

Finally, setup was ready. Now you can assign the slave node to the master node. Flow as follows.

Open the Jenkins dashboard by using the URL (http://YOUR IP:8080) and click on Manage Jenkins.

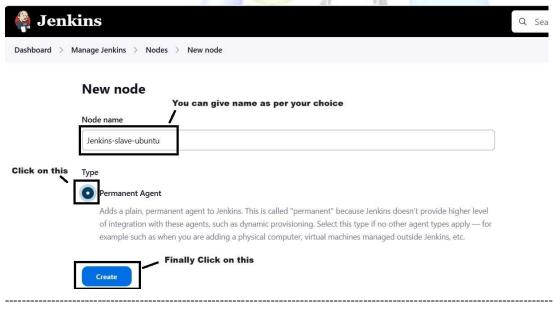
After clicking on that option 'Manage Jenkins' following page will appear.



After clicking on 'Nodes' option, the following page will appear.



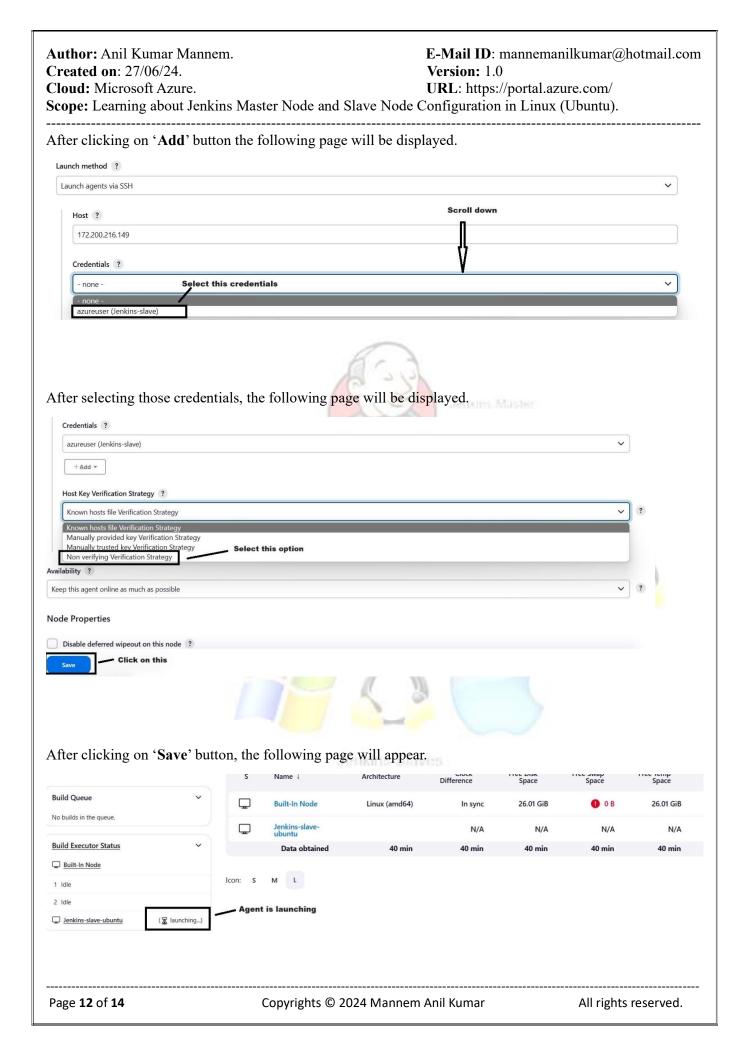
After clicking on '+ New Node' button the following page will appear.



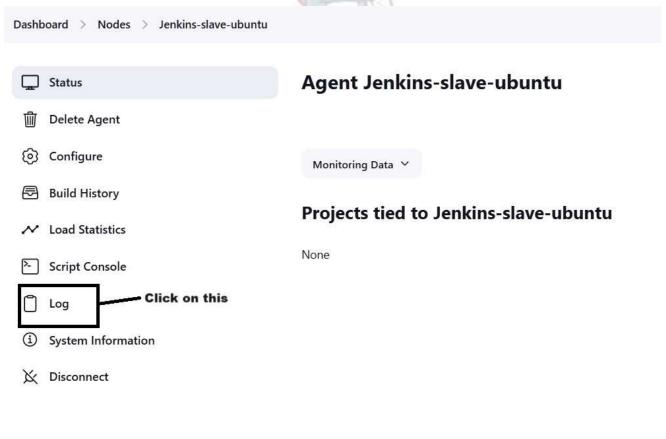
Author: Anil Kumar Mannem. E-Mail ID: mannemanilkumar@hotmail.com **Created on:** 27/06/24. Version: 1.0 Cloud: Microsoft Azure. **URL**: https://portal.azure.com/ Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu). After clicking on 'Create' button the following page will appear. **Jenkins** Q Search (C Dashboard > Manage Jenkins > Nodes > Name ? Jenkins-slave-ubuntu Description ? Scroll down the page Plain text Preview Change it In place of 1 Number of executors Remote root directory ? We can give any path based on permissions /home/azureuser After scrolling down, you will find the following option, You can give label name and select 'Only build jobs with label expressions matching this node' as shown in following screenshot. As per your choice Select this option Only build jobs with label expressions matching this node Only build jobs with label expressions matching this node Launch agent by connecting it to the controller Again, in that page we have to click on launch Method drop down option and select 'Launch agents via SSH'. As shown in the following screenshot. Usage ? Only build jobs with label expressions matching this node Launch method ? Launch agent by connecting it to the controller Launch agent by connecting it to the controller Launch agents via SSH Select this option Keep this agent online as much as possible Page 9 of 14 Copyrights © 2024 Mannem Anil Kumar All rights reserved.

Author: Anil Kumar Mannem. E-Mail ID: mannemanilkumar@hotmail.com **Created on:** 27/06/24. Version: 1.0 Cloud: Microsoft Azure. **URL**: https://portal.azure.com/ Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu). After selecting that option 'Launch agents via SSH' following page will appear. ~ Launch agents via SSH Jenkins-Slave IP Address Host ? 172.200.216.149 Credentials ? Jenkins Host Key Verification Strategy ? **~** ? Known hosts file Verification Strategy To configure the credentials for Jenkins-slave server, click on the 'Jenkins' button. Thus, following page will appear. Jenkins Credentials Provider: Jenkins Global credentials (unrestricted) Username with password Username with password SSH Username with private key Select this option Secret text Certificate After selecting that option 'SSH Username with private key', the following page will appear. Jenkins Credentials Provider: Jenkins SSH Username with private key Scope ? Global (Jenkins, nodes, items, all child items, etc) ID ? We can give any description Description ? jenkins-slave Jenkins-slave configured Username Username azureuser Treat username as secret ? Click on this Enter directly Page 10 of 14 Copyrights © 2024 Mannem Anil Kumar All rights reserved.

Author: Anil Kumar Mannem. E-Mail ID: mannemanilkumar@hotmail.com **Created on:** 27/06/24. Version: 1.0 Cloud: Microsoft Azure. URL: https://portal.azure.com/ Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu). After entering details like description and username. Click on 'Enter directly' button, thus the following page will appear. Private Key Enter directly Click on this Key No Stored Value After clicking on 'Add' button, the following page will appear. Enter directly Key We have to paste our private key content Enter New Secret Below After pasting the private key content (In earlier it was downloaded – Refer page-4) Private Key Enter directly Key Private key file content pasted Enter New Secret Below swRfhg/RzqGw3VJdrvNK5L9OoWmEsjRxh8VkrZqC5vc18Yl6OSD7tdmWh53S0kW7 9AMOu6iQ5oOeqvlzhWrc3XnpOoL4XKZzl/LsgzLmwPW6gPu6F5nx -- END RSA PRIVATE KEY---Passphrase Click on this Page **11** of **14** Copyrights © 2024 Mannem Anil Kumar All rights reserved.



Author: Anil Kumar Mannem. E-Mail ID: mannemanilkumar@hotmail.com **Created on:** 27/06/24. Version: 1.0 URL: https://portal.azure.com/ Cloud: Microsoft Azure. Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu). After few minutes, you can see the following screen. That Jenkins-Master and Jenkins-Slave nodes are in synchronise state. Setup was successful. **Nodes** + New Node **Configure Monitors** Setup was Successful Free Disk Space Response Time Clock Difference Free Temp Space Architecture Free Swap Space Name 1 Built-In Node 26.01 GiB 0 0 B 26.01 GiB (6) Linux (amd64) In sync 0ms Linux (amd64) In sync 26.54 GiB (0 B 26.54 GiB Data obtained 23 sec 23 sec 23 sec 23 sec 23 sec 23 sec To check the slave setup processing logs, click on 'Jenkins-slave-ubuntu'. The following page will be displayed.



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URL: https://portal.azure.com/
Scope: Learning about Jenkins Master Node and Slave Node Configuration in Linux (Ubuntu).

After clicking on 'Log' option, the following page will be displayed.



Scroll up the above page to see the total logs related to slave setup.

YOU HAVE SUCCESSFULLY COMPLETED THE SETUP. NOW YOU CAN BUILD YOUR JOBS IN SLAVE/WORKER NODES.

