

Capstone Project

Banking and Finance

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Date of Submission: 07-11-2024

Date of Resubmission:

Batch No.: SA2406007

Submitted To: Vikul Mentor

Project Phases:

Phase 1: Infrastructure Automation

- Create 4 AWS EC2 Instances
- Configure the Servers

Phase 2: Build and Deployment Automation

- Set up Jenkins Master, Slave Nodes, and Production Server
- Tools: Terraform, Ansible
- Virtual Machines: **VM1, VM2, VM3**

Master VM:

- Set up CI/CD pipeline jobs and schedule them to run on Slave Nodes.

Slave Node:

- Compile code, create artifacts, build the application image, and push it to Docker Hub.

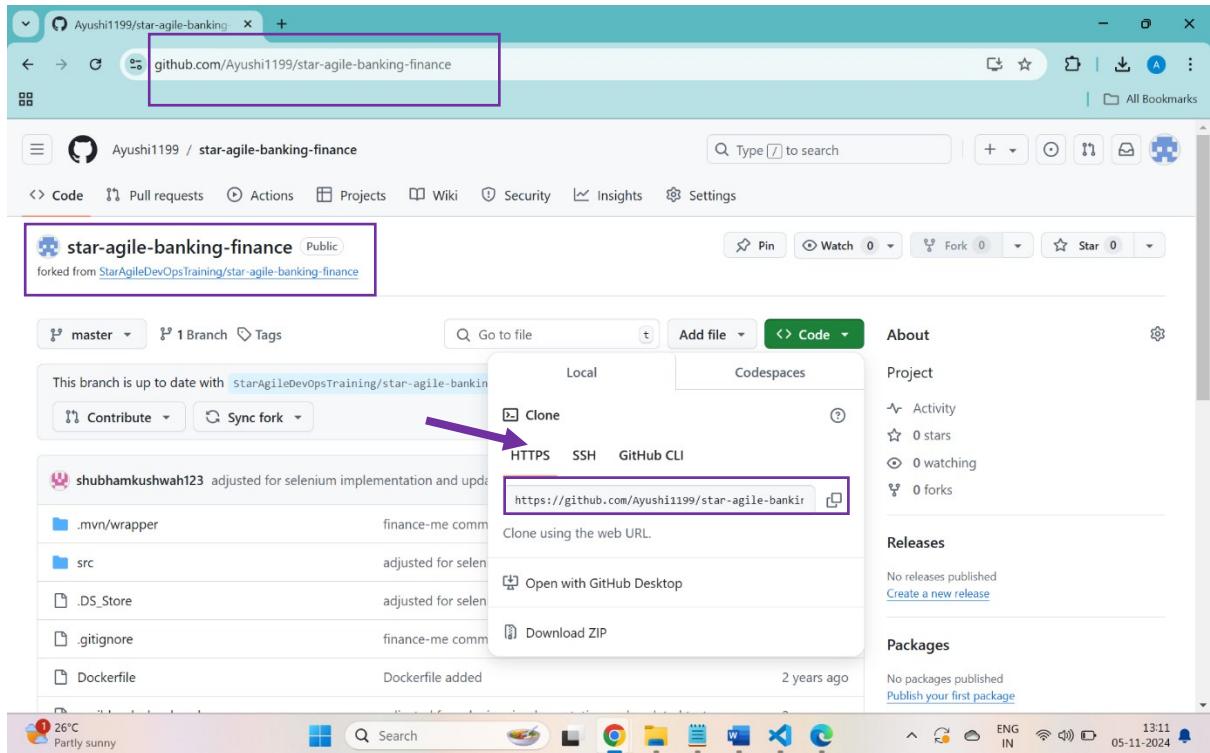
Production Server:

- Deploy the application on the production server.

Phase 3: Continuous Monitoring

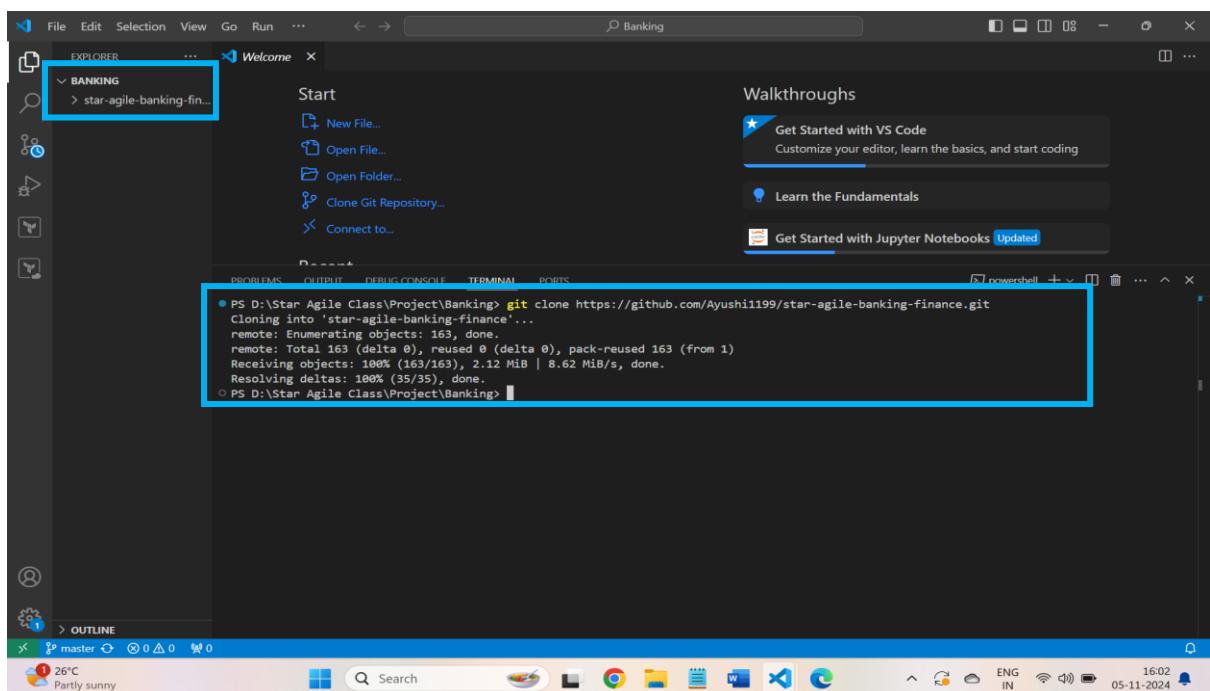
- Monitor Jenkins Slave Nodes and the Production Server using Prometheus and Grafana.

Step 1: Navigate to **GitHub**, copy the **HTTPS** link of the repository, and **clone** it to your **local machine**.



Step 2: Open **Visual Studio**, create a new **folder**, and select it. Open the **Terminal** and run the following command to clone the GitHub repository:

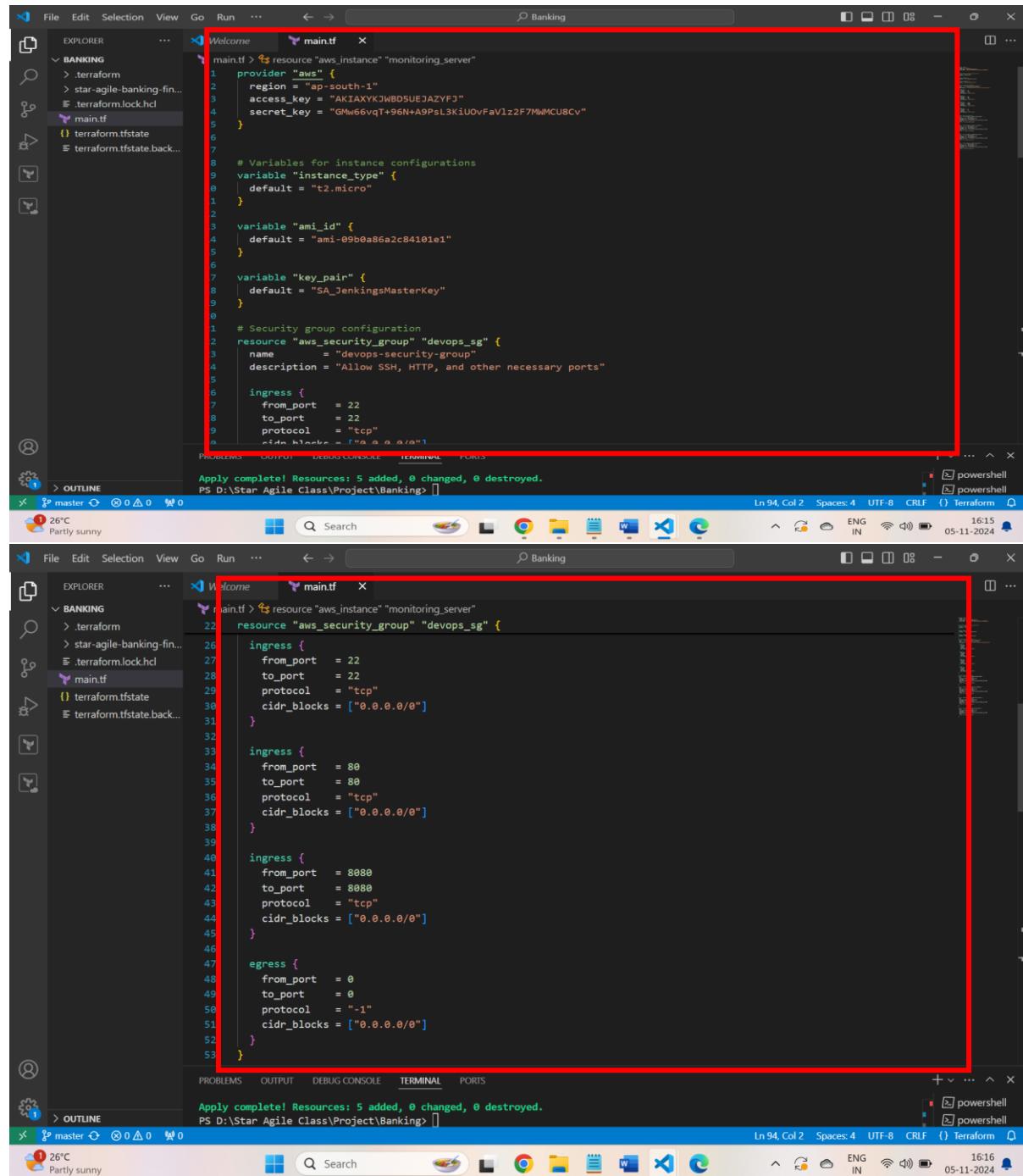
```
git clone <repository_address>
```



Step 3: To launch 4 AWS EC2 instances using Terraform in Visual Studio, follow these steps:

Jenkins_MasterNode, Jenkins_SlaveNode, Monitoring_Server, Production_Server

- Ensure **Visual Studio Code** is set up with the necessary **extensions** for Terraform (e.g., the *HashiCorp Terraform* extension).
- Create a **main.tf** file and add the following configuration to define the EC2 instances:



The image shows two screenshots of Visual Studio Code side-by-side, both displaying the same `main.tf` Terraform configuration file. A red box highlights the code in both windows.

```
provider "aws" {
  region = "ap-south-1"
  access_key = "AKIAXYKJWBD5UEJAZYFJ"
  secret_key = "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"
}

# Variables for instance configurations
variable "instance_type" {
  default = "t2.micro"
}

variable "ami_id" {
  default = "ami-09b0a86a2c84101e1"
}

variable "key_pair" {
  default = "SA_JenkinsMasterKey"
}

# Security group configuration
resource "aws_security_group" "devops_sg" {
  name            = "devops-security-group"
  description     = "Allow SSH, HTTP, and other necessary ports"

  ingress {
    from_port   = 22
    to_port     = 22
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }

  ingress {
    from_port   = 80
    to_port     = 80
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }

  ingress {
    from_port   = 8080
    to_port     = 8080
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }

  egress {
    from_port   = 0
    to_port     = 0
    protocol    = "-1"
    cidr_blocks = ["0.0.0.0/0"]
  }
}
```

The code defines an AWS provider with region `ap-south-1`. It sets variables for instance type (`t2.micro`), AMI ID (`ami-09b0a86a2c84101e1`), and key pair (`SA_JenkinsMasterKey`). It creates a security group named `devops_sg` with three ingress rules allowing traffic on port 22 (SSH), 80 (HTTP), and 8080 (HTTP). It also allows all outgoing traffic (-1) from any IP address.

A screenshot of the Visual Studio Code interface. The left sidebar shows a project structure with a folder named 'BANKING' containing '.terraform', 'main.tf', and 'terraform.lock.hcl'. The main editor window displays a Terraform configuration file named 'main.tf'. The code defines three AWS instances:

```
resource "aws_instance" "jenkins_masternode" {
    ami           = var.ami_id
    instance_type = var.instance_type
    key_name      = var.key_pair
    security_groups = [aws_security_group.devops_sg.name]
    tags = [
        Name = "Jenkins_MasterNode"
    ]
}

resource "aws_instance" "jenkins_slavenode" {
    ami           = var.ami_id
    instance_type = var.instance_type
    key_name      = var.key_pair
    security_groups = [aws_security_group.devops_sg.name]
    tags = [
        Name = "Jenkins_SlaveNode"
    ]
}

resource "aws_instance" "production_server1" {
    ami           = var.ami_id
    instance_type = var.instance_type
    key_name      = var.key_pair
    security_groups = [aws_security_group.devops_sg.name]
    tags = [
        Name = "Production_Server"
    ]
}
```

The status bar at the bottom indicates the file is 'Terraform' and shows the terminal tab is active.

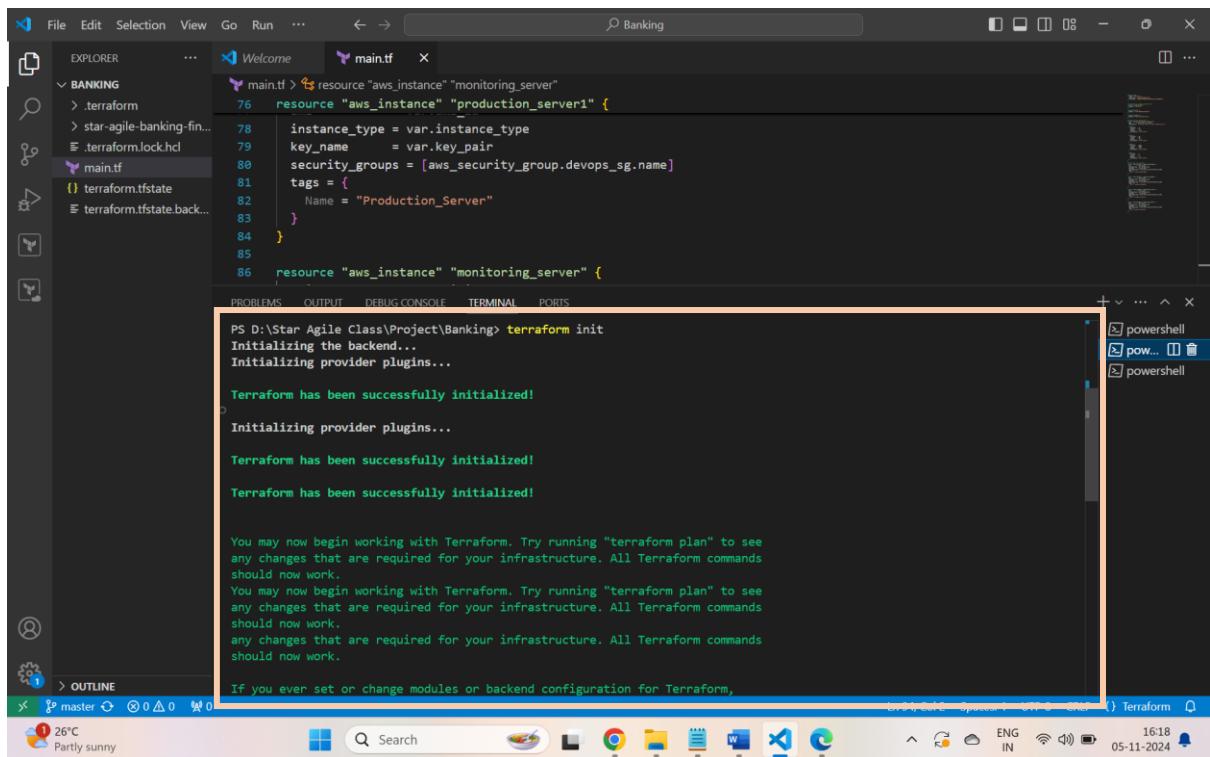
A second screenshot of the Visual Studio Code interface, showing the same project structure and 'main.tf' file. The code has been modified to define the instances in a different order:

```
resource "aws_instance" "production_server1" {
    instance_type = var.instance_type
    key_name      = var.key_pair
    security_groups = [aws_security_group.devops_sg.name]
    tags = [
        Name = "Production_Server"
    ]
}

resource "aws_instance" "monitoring_server" {
    ami           = var.ami_id
    instance_type = var.instance_type
    key_name      = var.key_pair
    security_groups = [aws_security_group.devops_sg.name]
    tags = [
        Name = "Monitoring_Server"
    ]
}
```

The status bar at the bottom indicates the file is 'Terraform' and shows the terminal tab is active.

- **Initialize Terraform:** Open the Terminal in Visual Studio Code and run this command: `terraform init`



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab selected. The terminal window displays the output of the `terraform init` command. The output indicates that Terraform is initializing the backend and provider plugins, and successfully initializes the configuration. It also provides instructions for working with Terraform and notes about module changes.

```

PS D:\Star Agile Class\Project\Banking> terraform init
Initializing the backend...
Initializing provider plugins...

Terraform has been successfully initialized!

Initializing provider plugins...
Terraform has been successfully initialized!
Terraform has been successfully initialized!
Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

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any changes that are required for your infrastructure. All Terraform commands
should now work.

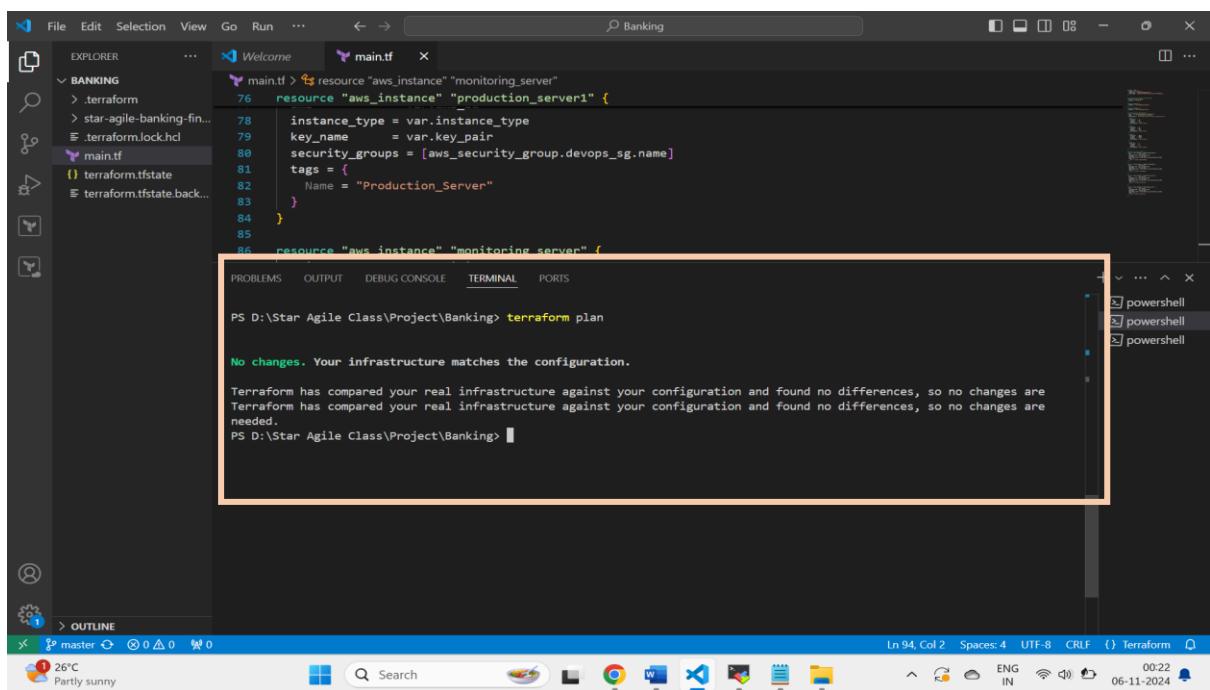
You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
make sure to run "terraform init" again to initialize those changes.

PS D:\Star Agile Class\Project\Banking>

```

- **Preview the Plan:** Check what Terraform will create with: `terraform plan`



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab selected. The terminal window displays the output of the `terraform plan` command. The output shows that there are no changes, indicating that the infrastructure matches the configuration.

```

PS D:\Star Agile Class\Project\Banking> terraform plan

No changes. Your infrastructure matches the configuration.

Terraform has compared your real infrastructure against your configuration and found no differences, so no changes are
Terraform has compared your real infrastructure against your configuration and found no differences, so no changes are
needed.
PS D:\Star Agile Class\Project\Banking>

```

- **Apply the Configuration:** Deploy the instances by running: `terraform apply`

The screenshot shows the VS Code interface with the 'Banking' workspace selected. The Explorer sidebar shows files like '.terraform', 'main.tf', 'terraform.lock.hcl', 'main.tfstate', and 'terraform.tfstate.backup'. The main editor shows the 'main.tf' file with Terraform code defining two AWS instances. The terminal tab is active, displaying the command 'terraform apply' and its execution plan. The status bar at the bottom right shows the date as 05-11-2024.

```

PS D:\Star Agile Class\Project\Banking> terraform apply

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the
following symbols:
+ create

Terraform will perform the following actions:

# aws_instance.jenkins_masternode will be created
+ resource "aws_instance" "jenkins_masternode" {
    + ami                                = "ami-09b0a86a2c84101e1"
    + arn                                = (known after apply)
    + associate_public_ip_address         = (known after apply)
    + availability_zone                  = (known after apply)
    + cpu_core_count                     = (known after apply)
    + cpu_threads_per_core              = (known after apply)
    + disable_api_stop                  = (known after apply)
    + disable_api_termination           = (known after apply)
    + ebs_optimized                     = (known after apply)
    + get_password_data                = false
    + host_id                            = (known after apply)
    + host_resource_group_arn           = (known after apply)
    + iam_instance_profile              = (known after apply)
}

```

This screenshot is similar to the previous one, showing the VS Code interface with the 'Banking' workspace. The terminal output shows the actual execution of the 'terraform apply' command, with progress messages for creating security groups and instances. The status bar at the bottom right shows the date as 05-11-2024.

```

aws_security_group.devops_sg: Creating...
aws_security_group.devops_sg: Creation complete after 3s [id=sg-0718791d7be5ac6e7]
aws_instance.jenkins_masternode: Creating...
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

aws_security_group.devops_sg: Creating...
aws_security_group.devops_sg: Creation complete after 3s [id=sg-0718791d7be5ac6e7]
aws_instance.jenkins_masternode: Creating...

Enter a value: yes

aws_security_group.devops_sg: Creating...
aws_security_group.devops_sg: Creation complete after 3s [id=sg-0718791d7be5ac6e7]
aws_instance.jenkins_masternode: Creating...

aws_security_group.devops_sg: Creating...
aws_security_group.devops_sg: Creation complete after 3s [id=sg-0718791d7be5ac6e7]
aws_instance.jenkins_masternode: Creating...
aws_instance.jenkins_masternode: Creating...

```

The screenshot shows the Visual Studio Code interface with the Terraform extension installed. The left sidebar has a tree view with 'BANKING' expanded, showing '.terraform', '.terraform.lock.hcl', and 'main.tf'. The main editor shows 'main.tf' with the following code:

```
resource "aws_instance" "production_server1" {
    instance_type = var.instance_type
    key_name      = var.key_pair
    security_groups = [aws_security_group.devops_sg.name]
    tags = {
        Name = "Production_Server"
    }
}

resource "aws_instance" "monitoring_server" {
```

The terminal tab shows the output of a 'terraform apply' command:

```
aws_instance.production_server1: Still creating... [10s elapsed]
aws_instance.production_server1: Still creating... [10s elapsed]
aws_instance.jenkins_slavenode: Creation complete after 12s [id=i-0cd922a40fef663ae]
aws_instance.monitoring_server: Creation complete after 12s [id=i-0f27b3ece40dbd9ed]
aws_instance.jenkins_slavenode: Creation complete after 12s [id=i-0cd922a40fef663ae]
aws_instance.monitoring_server: Creation complete after 12s [id=i-0f27b3ece40dbd9ed]
aws_instance.monitoring_server: Creation complete after 12s [id=i-0f27b3ece40dbd9ed]
aws_instance.production_server1: Creation complete after 12s [id=i-0adb647fd31bafb]
aws_instance.jenkins_masternode: Creation complete after 12s [id=i-08583c259c1071e6a]

Apply complete! Resources: 5 added, 0 changed, 0 destroyed.
PS D:\Star Agile Class\Project\Banking> 
```

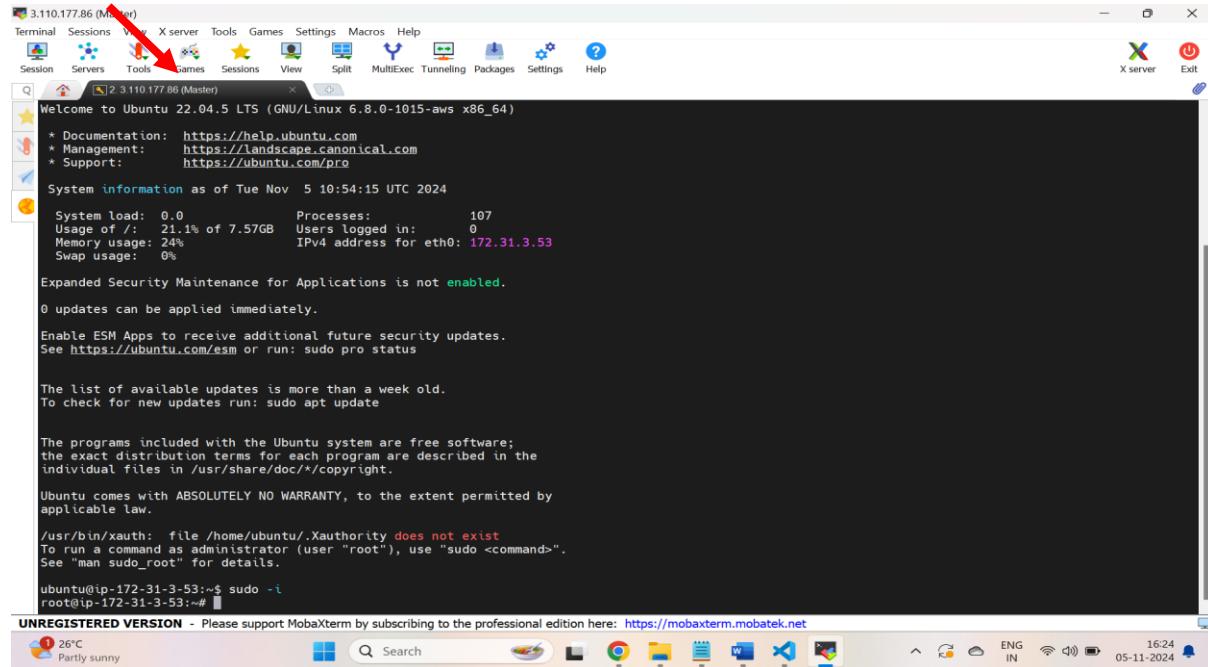
Step 4: Navigate to the AWS Management Console to verify the four instances that were created using Terraform.

The screenshot shows the AWS Management Console with the URL 'ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#Instances:instanceState=running'. A red arrow points to the user 'Ayushi' in the top right corner. The left sidebar shows the navigation menu for EC2, including 'Instances', 'Images', and 'Elastic Block Store'. The main content area displays a table of running instances:

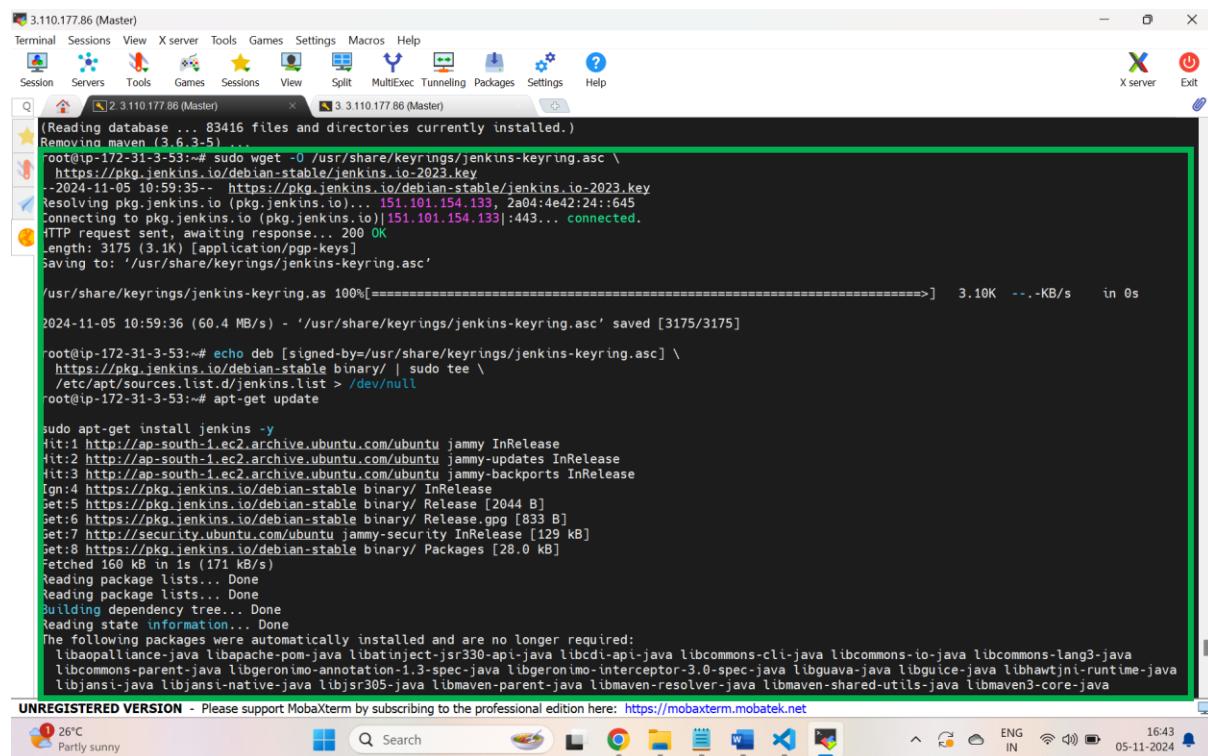
Name	Instance ID	Instance state	Instance type	Status check	Alarms
Monitoring_Server	i-0a02426fe36e346ba	Running	t2.micro	Initializing	View alarms
Production_Server	i-0e33e11c05365f8a9	Running	t2.micro	Initializing	View alarms
Jenkins_SlaveNode	i-071adcdc8597ad246	Running	t2.micro	Initializing	View alarms
Jenkins_MasterNode	i-00cd9840134568296	Running	t2.micro	Initializing	View alarms

A modal window titled 'Select an instance' is open at the bottom, listing the same four instances.

Step 5: Use MobaXterm to connect to the Jenkins_MasterNode instance via SSH and install the required tools on the instance (java, git, jenkins).



- Install Jenkins



```
libplexus-utils2-java libsisu-inject-java libsisu-plexus-jar libsf4j-java libwagon-file-jar libwagon-http-shaded-jar libwagon-provider-api-jar
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  net-tools
The following NEW packages will be installed:
  jenkins net-tools
0 upgraded, 2 newly installed, 0 to remove and 16 not upgraded.
Need to get 94.3 MB of archives.
After this operation, 96.9 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 net-tools amd64 1.60+git20181103.0eebece-1ubuntu5 [204 kB]
Get:2 https://pkgs.jenkins.io/debian-stable binary/ jenkins 2.479.1 [94.1 MB]
Fetched 94.3 MB in 9s (11.0 MB/s)
Selecting previously unselected package net-tools.
(Reading database ... 83355 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20181103.0eebece-1ubuntu5_amd64.deb ...
Unpacking net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Selecting previously unselected package jenkins.
Preparing to unpack .../jenkins_2.479.1_all.deb ...
Unpacking jenkins (2.479.1) ...
Setting up net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Setting up jenkins (2.479.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /lib/systemd/system/jenkins.service.
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

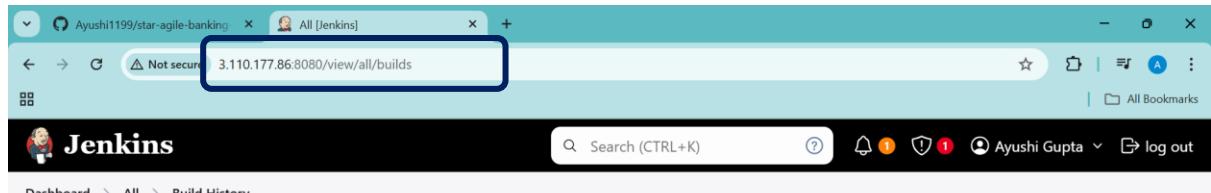
10 VM guests are running outdated hypervisors (qemu). Behavior on this host.
root@ip-172-31-3-53:~# jenkins --version
2.479.1
root@ip-172-31-3-53:~# systemctl status jenkins
```

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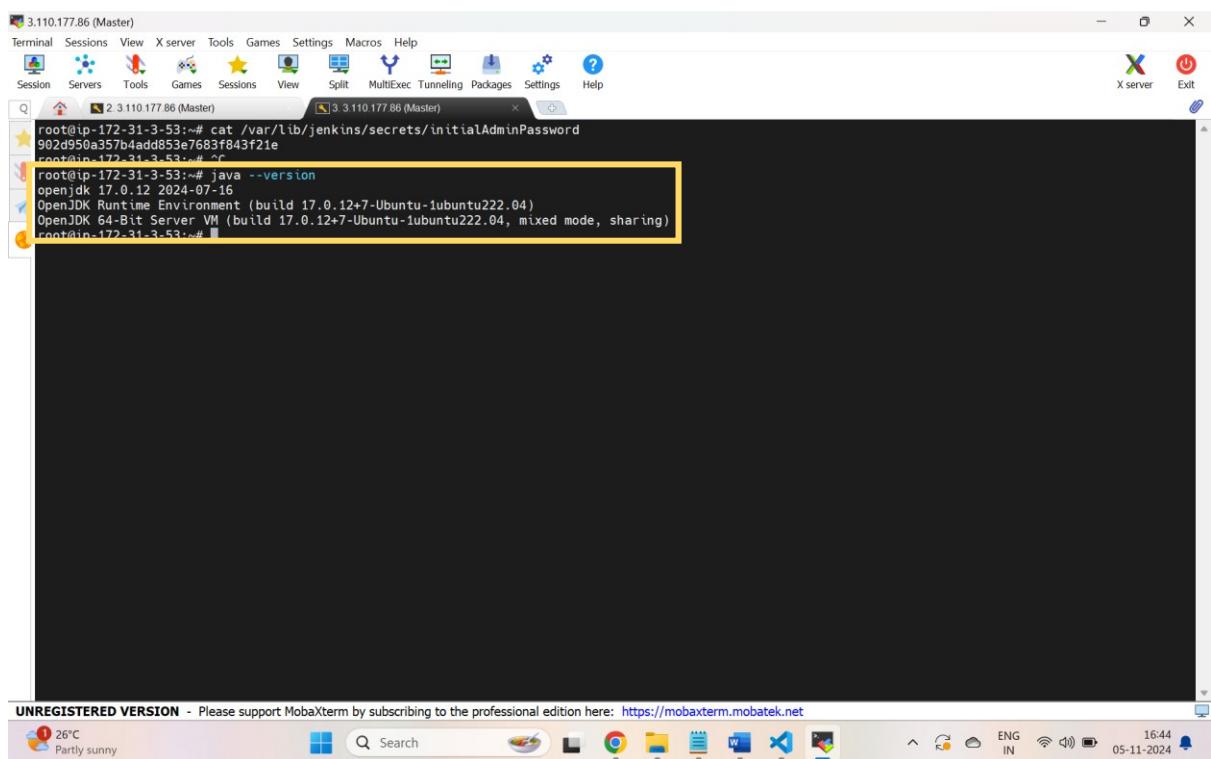
```
root@ip-172-31-3-53:~# cat /var/lib/jenkins/secrets/initialAdminPassword
802d950a357b4add853e7683f843f21e
root@ip-172-31-3-53:~# ^C
root@ip-172-31-3-53:~# java --version
openjdk 17.0.12 2024-07-16
OpenJDK Runtime Environment (build 17.0.12+7-Ubuntu-1ubuntu22.04)
OpenJDK 64-Bit Server VM (build 17.0.12+7-Ubuntu-1ubuntu22.04, mixed mode, sharing)
root@ip-172-31-3-53:~# git --version
git version 2.34.1
root@ip-172-31-3-53:~# useradd master -s /bin/bash -m -d /home/master
root@ip-172-31-3-53:~# passwd master
New password:
Retype new password:
No password has been supplied.
New password:
Retype new password:
passwd: password updated successfully
root@ip-172-31-3-53:~# vi /etc/sh/ssh_config
root@ip-172-31-3-53:~# service ssh reload
root@ip-172-31-3-53:~# visudo
root@ip-172-31-3-53:~# usermod -aG jenkins master
root@ip-172-31-3-53:~# groups master
master : master jenkins
root@ip-172-31-3-53:~# su - master
master@ip-172-31-3-53:~$
```

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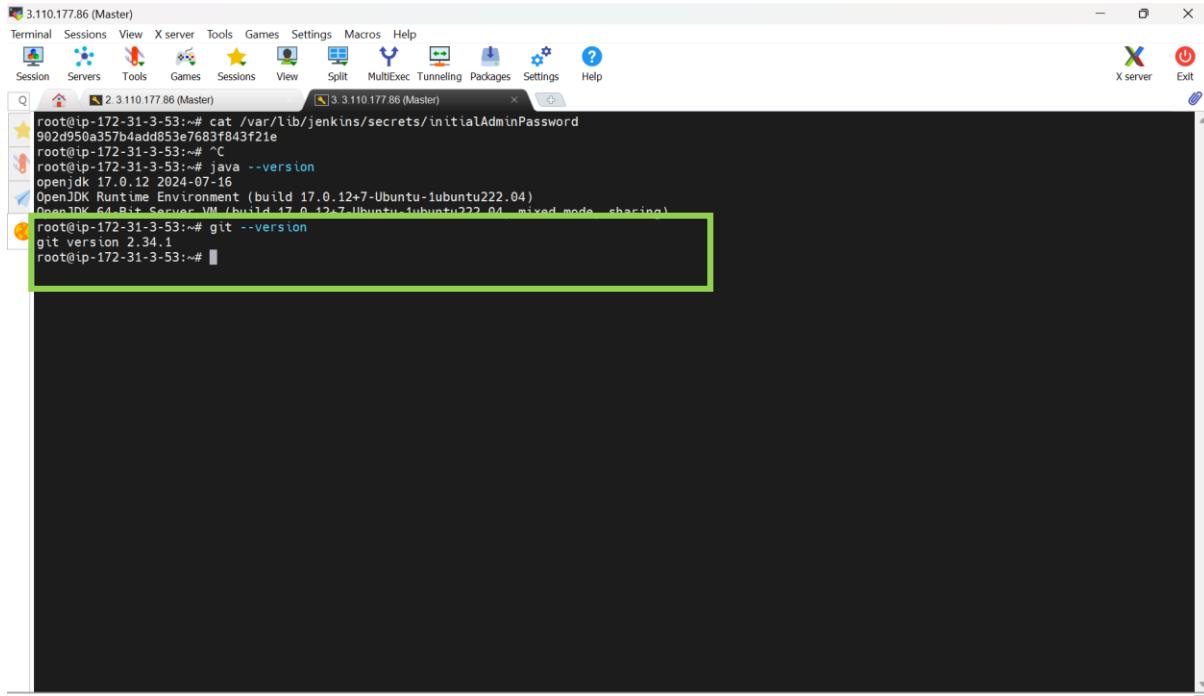
Access the Jenkins server instance via its **public IP** at port **8080**.



● Install Java



- Install git



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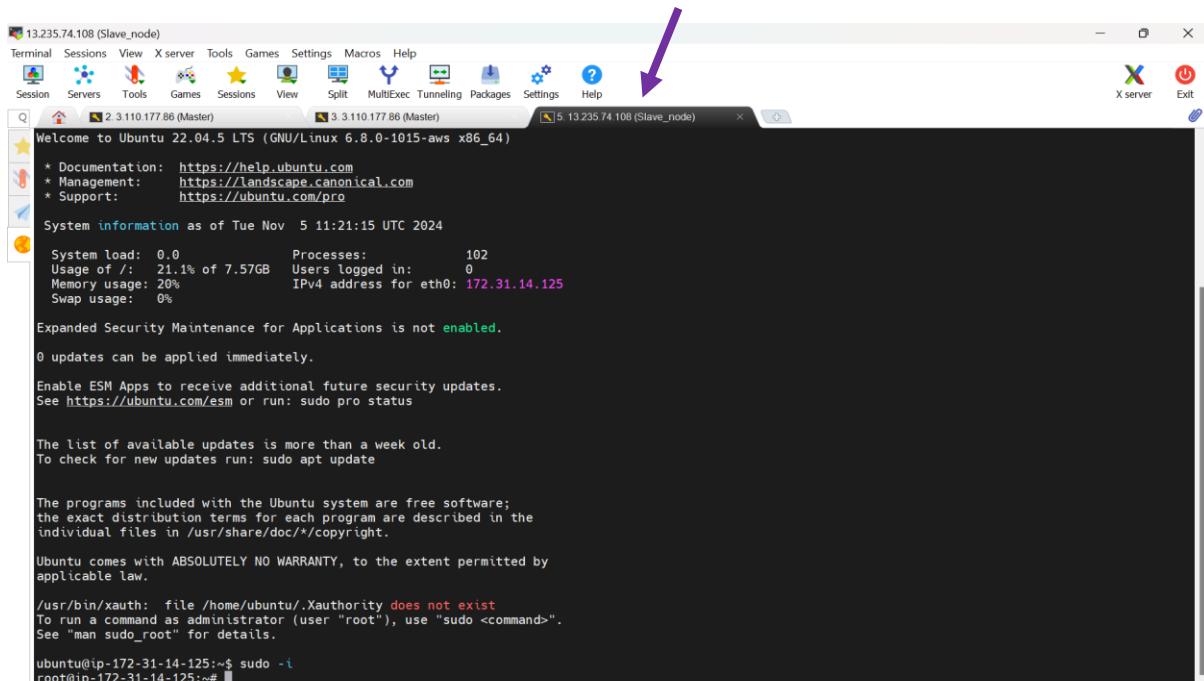
26°C Partly sunny Search ENG IN 16:44 05-11-2024

```

root@ip-172-31-3-53:~# cat /var/lib/jenkins/secrets/initialAdminPassword
902d950a357b4add853e7683f843f2ie
root@ip-172-31-3-53:~# ^C
root@ip-172-31-3-53:~# java --version
openjdk 17.0.12 2024-07-16
OpenJDK Runtime Environment (build 17.0.12+7-Ubuntu-1ubuntu222.04)
OpenJDK 64-Bit Server VM (build 17.0.12+7-Ubuntu-1ubuntu222.04, mixed mode, sharing)
root@ip-172-31-3-53:~# git --version
git version 2.34.1
root@ip-172-31-3-53:~#

```

Step 6: Use MobaXterm to connect to the Jenkins_SlaveNode instance via SSH and install the required tools on the instance (**git, maven, java, docker, ansible**).



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26°C Partly sunny Search ENG IN 16:51 05-11-2024

```

Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1015-aws x86_64)

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

System information as of Tue Nov  5 11:21:15 UTC 2024

System load: 0.0      Processes:          102
Usage of /: 21.1% of 7.57GB   Users logged in:  0
Memory usage: 20%           IPv4 address for eth0: 172.31.14.125
Swap usage:  0%           Swap usage:        0

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

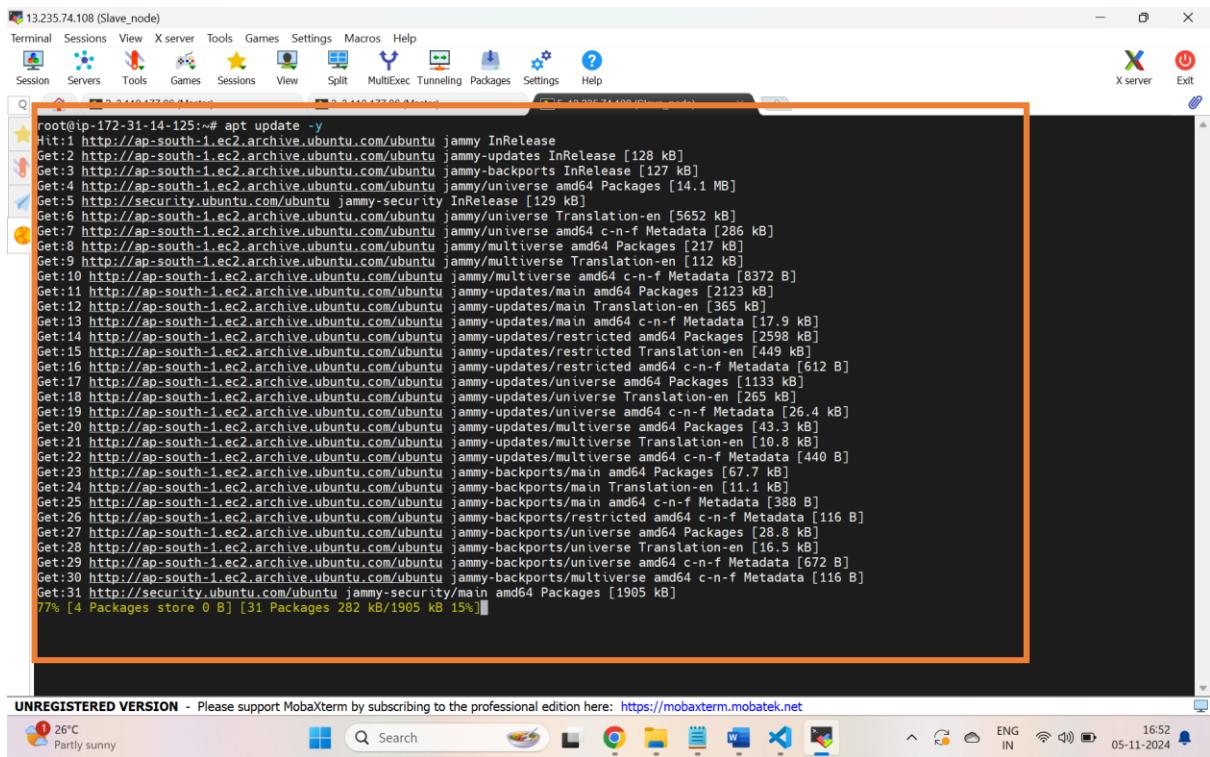
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

/usr/bin/xauth: file /home/ubuntu/.Xauthority does not exist
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

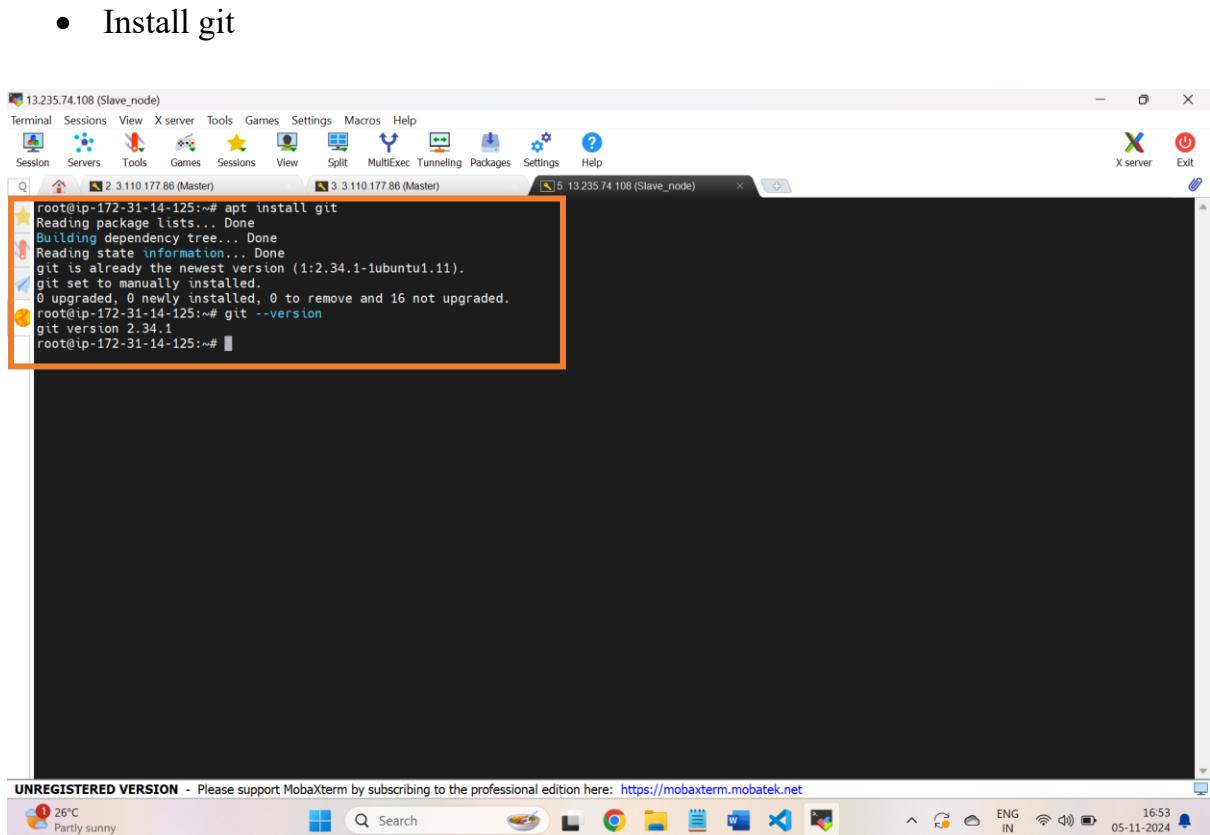
ubuntu@ip-172-31-14-125:~$ sudo -i
root@ip-172-31-14-125:#

```



root@ip-172-31-14-125:~# apt update -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [2123 kB]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [365 kB]
Get:13 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [17.9 kB]
Get:14 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [2598 kB]
Get:15 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [449 kB]
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [612 B]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1133 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [265 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [26.4 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [43.3 kB]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [10.8 kB]
Get:22 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [440 B]
Get:23 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [67.7 kB]
Get:24 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [11.1 kB]
Get:25 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:26 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:27 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [28.8 kB]
Get:28 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [16.5 kB]
Get:29 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [672 B]
Get:30 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:31 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1905 kB]
77% [4 Packages store 0 B] [31 Packages 282 kB/1905 kB 15%]

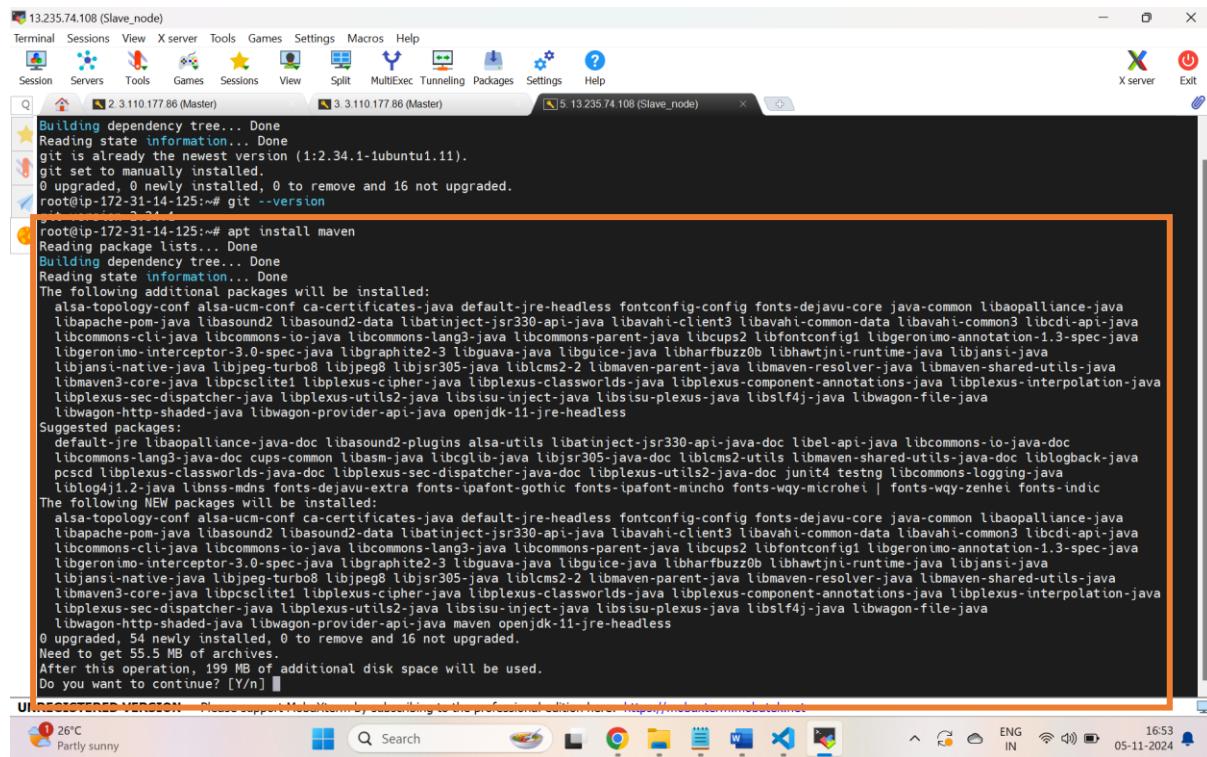
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root@ip-172-31-14-125:~# apt install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
git is already the newest version (1:2.34.1-1ubuntu1.11).
git set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 16 not upgraded.
root@ip-172-31-14-125:~# git --version
git version 2.34.1
root@ip-172-31-14-125:~#

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- Install maven



13.235.74.108 (Slave_node)

Terminal Sessions View Xserver Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help

X server Exit

2.3.110.177.86 (Master) 3.3.110.177.86 (Master) 5.13.235.74.108 (Slave_node)

```

Building dependency tree... Done
Reading state information... Done
git is already the newest version (1:2.34.1-1ubuntu1.11).
git set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 16 not upgraded.
root@ip-172-31-14-125:~# git -version

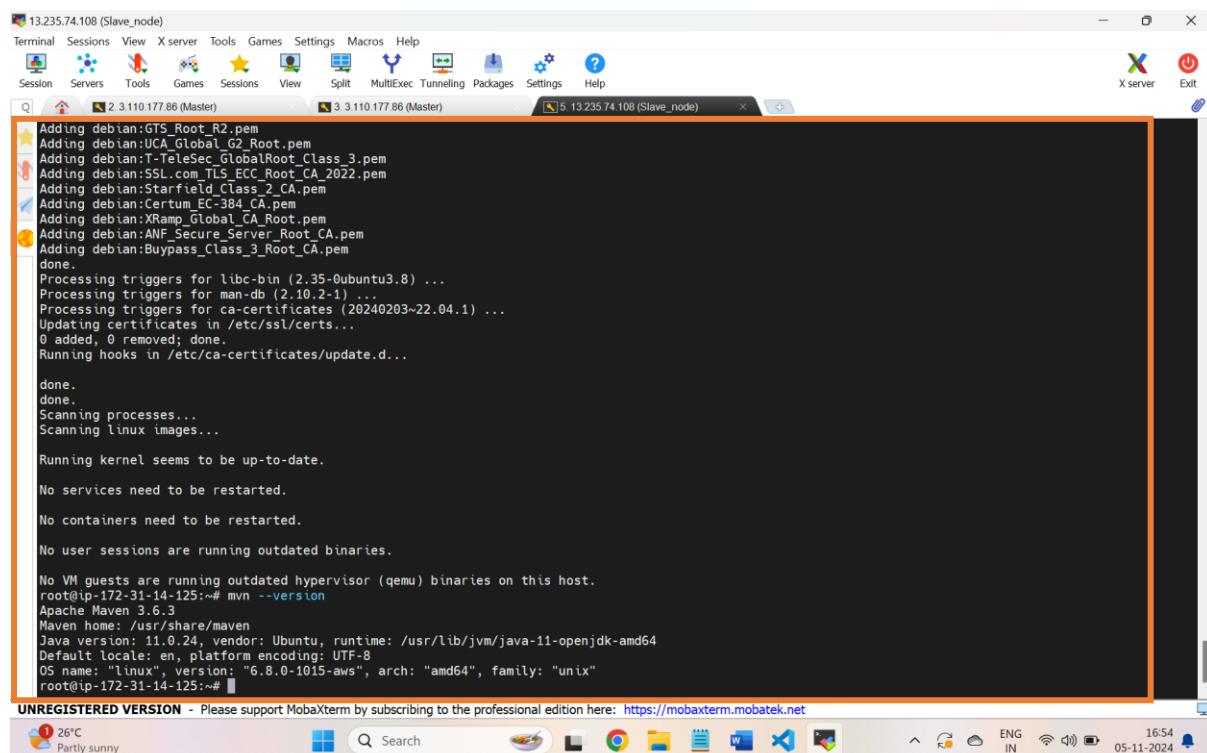
```

```

root@ip-172-31-14-125:~# apt install maven
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
alsa-topology-conf alsamixer-conf ca-certificates-java default-jre-headless fontconfig-config fonts-dejavu-core java-common libapolloniance-java
libapache-pom-java libasound2 libattribution2-data libatinject-jsr330-api-java libavahi-client3 libavahi-common-data libavahi-common3 libbcdi-api-java
libcommons-cli-java libcommons-io-java libcommons-lang3-java libcommons-parent-java libcurl2 libfontconfig1 liberonimo-annotation-1.3-spec-java
liberonimo-interceptor-3.0-spec-java libgraphite2-3 libguava-java libgurc-java libharfbuzz0b libhawtjni-runtime-java libjansi-java
libjansi-native-java libjpeg-turbo8 libjpeg8 libjsr305-java liblcms2-2 libmaven-parent-java libmaven-resolver-java libmaven-shared-utils-java
libmaven3-core-java libpcsc-lite1 libplexus-cipher-java libplexus-classworlds-java libplexus-component-annotations-java libplexus-interpolation-java
libplexus-sec-dispatcher-java libplexus-util2-2 java libsisu-inject-java libsisu-plexus-java libssl4j-java libwagon-file-java
libwagon-http-shaded-java libwagon-provider-api-java openjdk-11-jre-headless
Suggested packages:
default-jre libapolloniance-java-doc libasound2-plugins alsamixer-conf fonts-dejavu-core java-common libapolloniance-java-doc
libcommons-lang3-java-doc cups-common libcurl2-java libfontconfig1 liberonimo-annotation-1.3-spec-java
pcscd libplexus-classworlds-java-doc libplexus-sec-dispatcher-java-doc libplexus-util2-java-doc junit4 testing libcommons-logging-java
liblog4j1.2-jar libnss-mdns fonts-dejavu-extra fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic
The following NEW packages will be installed:
alsa-topology-conf alsamixer-conf ca-certificates-java default-jre-headless fontconfig-config fonts-dejavu-core java-common libapolloniance-java
libapache-pom-java libasound2-data libatinject-jsr330-api-java libavahi-client3 libavahi-common-data libavahi-common3 libbcdi-api-java
libcommons-cli-java libcommons-lang3-java libcommons-parent-java libcurl2 libfontconfig1 liberonimo-annotation-1.3-spec-java
liberonimo-interceptor-3.0-spec-java libgraphite2-3 libguava-java libgurc-java libharfbuzz0b libhawtjni-runtime-java libjansi-java
libjansi-native-java libjpeg-turbo8 libjpeg8 libjsr305-java liblcms2-2 libmaven-parent-java libmaven-resolver-java libmaven-shared-utils-java
libmaven3-core-java libpcsc-lite1 libplexus-cipher-java libplexus-classworlds-java libplexus-component-annotations-java libplexus-interpolation-java
libplexus-sec-dispatcher-java libplexus-util2-2 java libsisu-inject-java libsisu-plexus-java libssl4j-java libwagon-file-java
libwagon-http-shaded-java libwagon-provider-api-java openjdk-11-jre-headless
0 upgraded, 54 newly installed, 0 to remove and 16 not upgraded.
Need to get 55.5 MB of archives.
After this operation, 199 MB of additional disk space will be used.
Do you want to continue? [Y/n] 
```

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26°C Partly sunny 16:53 05-11-2024



13.235.74.108 (Slave_node)

Terminal Sessions View Xserver Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help

X server Exit

2.3.110.177.86 (Master) 3.3.110.177.86 (Master) 5.13.235.74.108 (Slave_node)

```

Adding debian:GTS_Root_R2.pem
Adding debian:UCA_Global_G2_Root.pem
Adding debian:T_TeleSec_GlobalRoot_Class_3.pem
Adding debian:SSL_com_TLS_ECC_Root_CA_2022.pem
Adding debian:Starfield_Class_2_CA.pem
Adding debian:Certum_EC-384_CA.pem
Adding debian:XRamp_Global_CA_Root.pem
Adding debian:ANF_Secure_Server_Root_CA.pem
Adding debian:Buypass_Class_3_Root_CA.pem
done.
Processing triggers for libc-bin (2.35-0ubuntu3.8) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for ca-certificates (20240203~22.04.1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...

done.
done.
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-14-125:~# mvn -version
Apache Maven 3.6.3
Maven home: /usr/share/maven
Java version: 11.0.24, vendor: Ubuntu, runtime: /usr/lib/jvm/java-11-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.8.0-1015-aws", arch: "amd64", family: "unix"
root@ip-172-31-14-125:~# 
```

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26°C Partly sunny 16:54 05-11-2024

- Install java

```

root@ip-172-31-14-125:~# apt install openjdk-17-jdk -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
adwaita-icon-theme-at-sp12-core dconf-service fontconfig fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache
hicolor-icon-themes humanity-icon-themes libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0 libatk1.0-data libatspi2.0-0
libcairo-gobject2 libcairo2 libdatrie libdconf libdeflate libdrm-amdgpu libdrm-intel libdrm-nouveau libdrm-radeon libfontenc1 libgail-common
libgail18 libgdgk-pixbuf2-0.0 libgdgk-pixbuf2.0-bin libgdgk-pixbuf2.0-common libgif7 libgl1 libgl1-amber-dri libglapi-mesa libglvnd0
libglx-mesa0 libglx0 libgtk2.0-0 libgtk2.0-bin libgtk2.0-common libice6 libjbig0 liblvm15 libpango-1.0-0 libpangocairo-1.0-0
libpangoft2-1.0-0 libpangoft2.0 libpixcavess0 libpixman-1.0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsensors5 libsm-dev libsm6
libthai-data libthai libtiff5 libwebp7 libx11-dev libx11-xcb1 libxau-dev libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0
libxcb-randr0 libxcb-render0 libxcb-shm0 libxcb-sync1 libxcbc1-dev libxcomposite1 libxcursor1 libxdamage1 libxdmcp-dev
libxfixes3 libxft2 libxkb libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrander2 libxshmfence1 libxt-dev libxt6 libxtst6 libxv1 libxf86dg1
libxf86mi openjdk-17-jdk-headless openjdk-17-jre openjdk-17-jre-headless session-migration ubuntu-mono x11-common x11proto-dev
xorg-sgml-doctools xtrans-dev
Suggested packages:
gvfs libice-doc librsvg2-bin lm-sensors libxkb-doc libx11-doc libxt-doc openjdk-17-demo openjdk-17-source visualvm libnss-mdns
fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zhenhei fonts-indic mese-utils
The following NEW packages will be installed:
adwaita-icon-theme-at-sp12-core dconf-service fontconfig fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache
hicolor-icon-themes humanity-icon-themes libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0 libatk1.0-data libatspi2.0-0
libcairo-gobject2 libcairo2 libdatrie libdconf libdeflate libdrm-amdgpu libdrm-intel libdrm-nouveau libdrm-radeon libfontenc1 libgail-common
libgail18 libgdgk-pixbuf2-0.0 libgdgk-pixbuf2.0-common libgif7 libgl1 libgl1-amber-dri libglapi-mesa libglvnd0
libglx-mesa0 libglx0 libgtk2.0-0 libgtk2.0-bin libgtk2.0-common libice6 libjbig0 liblvm15 libpango-1.0-0 libpangocairo-1.0-0
libpangoft2-1.0-0 libpangoft2.0 libpixcavess0 libpixman-1.0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsensors5 libsm-dev libsm6
libthai-data libthai libtiff5 libwebp7 libx11-dev libx11-xcb1 libxau-dev libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0
libxcb-randr0 libxcb-render0 libxcb-shm0 libxcb-sync1 libxcbc1-dev libxcomposite1 libxcursor1 libxdamage1 libxdmcp-dev
libxfixes3 libxft2 libxkb libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrander2 libxshmfence1 libxt-dev libxt6 libxtst6 libxv1 libxf86dg1
libxf86mi openjdk-17-jdk openjdk-17-jdk-headless openjdk-17-jre openjdk-17-jre-headless session-migration ubuntu-mono x11-common x11proto-dev
x11proto-dev xorg-sgml-doctools xtrans-dev
0 upgraded, 108 newly installed, 0 to remove and 16 not upgraded.
Need to get 179 MB of archives.
After this operation, 521 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 hicolor-icon-theme all 0.17-2 [9976 B]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgdgk-pixbuf2.0-common all 2.42.8+dfsg-1ubuntu0.3 [5630 B]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libdeflate0 amd64 1.10-2 [70.9 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libjbig0 amd64 2.1-3.1ubuntu0.22.04.1 [29.2 kB]

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```

```

root@ip-172-31-14-125:~# apt install openjdk-17-jdk -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
adwaita-icon-theme-at-sp12-core dconf-service fontconfig fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache
hicolor-icon-themes humanity-icon-themes libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0 libatk1.0-data libatspi2.0-0
libcairo-gobject2 libcairo2 libdatrie libdconf libdeflate libdrm-amdgpu libdrm-intel libdrm-nouveau libdrm-radeon libfontenc1 libgail-common
libgail18 libgdgk-pixbuf2-0.0 libgdgk-pixbuf2.0-bin libgdgk-pixbuf2.0-common libgif7 libgl1 libgl1-amber-dri libglapi-mesa libglvnd0
libglx-mesa0 libglx0 libgtk2.0-0 libgtk2.0-bin libgtk2.0-common libice6 libjbig0 liblvm15 libpango-1.0-0 libpangocairo-1.0-0
libpangoft2-1.0-0 libpangoft2.0 libpixcavess0 libpixman-1.0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsensors5 libsm-dev libsm6
libthai-data libthai libtiff5 libwebp7 libx11-dev libx11-xcb1 libxau-dev libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0
libxcb-randr0 libxcb-render0 libxcb-shm0 libxcb-sync1 libxcbc1-dev libxcomposite1 libxcursor1 libxdamage1 libxdmcp-dev
libxfixes3 libxft2 libxkb libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrander2 libxshmfence1 libxt-dev libxt6 libxtst6 libxv1 libxf86dg1
libxf86mi openjdk-17-jdk openjdk-17-jdk-headless openjdk-17-jre openjdk-17-jre-headless session-migration ubuntu-mono x11-common x11proto-dev
x11proto-dev xorg-sgml-doctools xtrans-dev
0 upgraded, 108 newly installed, 0 to remove and 16 not upgraded.
Need to get 179 MB of archives.
After this operation, 521 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 hicolor-icon-theme all 0.17-2 [9976 B]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgdgk-pixbuf2.0-common all 2.42.8+dfsg-1ubuntu0.3 [5630 B]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 libdeflate0 amd64 1.10-2 [70.9 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libjbig0 amd64 2.1-3.1ubuntu0.22.04.1 [29.2 kB]

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```

- Install docker

```

root@ip-172-31-14-125:~# apt install docker.io -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 16 not upgraded.
Need to get 75.5 MB of archives.
After this operation, 284 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 pigz amd64 2.6-1 [63.6 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 bridge-utils amd64 1.7-1ubuntu3 [34.4 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 runc amd64 1.1.12-0ubuntu2-22.04.1 [8405 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 containerd amd64 1.7.12-0ubuntu2-22.04.1 [37.8 MB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 dns-root-data all 2023112702-ubuntu0.22.04.1 [5136 B]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 dnsmasq-base amd64 2.90-0ubuntu0.22.04.1 [374 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 docker.io amd64 24.0.7-0ubuntu2~22.04.1 [28.8 MB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 ubuntu-fan all 0.12.16 [35.2 kB]
Fetched 75.5 MB in 1s (61.0 MB/s)
Preconfiguring packages...
Selecting previously unselected package pigz.
(Reading database ... 85%

```

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```

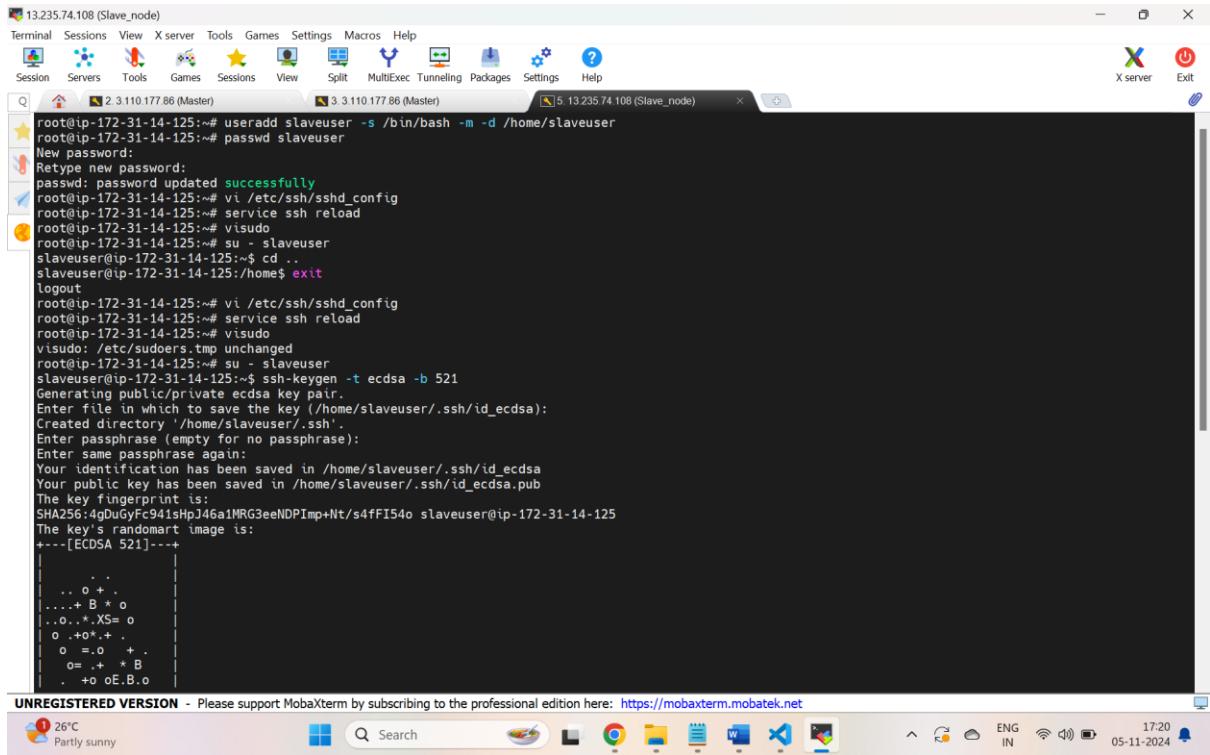
Unpacking dnsmasq-base (2.90-0ubuntu0.22.04.1) ...
Selecting previously unselected package docker.io.
Preparing to unpack .../6-docker.io_24.0.7-0ubuntu2~22.04.1_amd64.deb ...
Unpacking docker.io (24.0.7-0ubuntu2~22.04.1) ...
Selecting previously unselected package ubuntu-fan.
Preparing to unpack .../7-ubuntu-fan_0.12.16_all.deb ...
Unpacking ubuntu-fan (0.12.16) ...
Setting up dnsmasq-base (2.90-0ubuntu0.22.04.1) ...
Setting up runc (1.1.12-0ubuntu2~22.04.1) ...
Setting up dns-root-data (2023112702-ubuntu0.22.04.1) ...
Setting up bridge-utils (1.7-1ubuntu3) ...
Setting up pigz (2.6-1) ...
Setting up containerd (1.7.12-0ubuntu2~22.04.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/containerd.service → /lib/systemd/system/containerd.service.
Setting up ubuntu-fan (0.12.16) ...
Created symlink /etc/systemd/system/multi-user.target.wants/ubuntu-fan.service → /lib/systemd/system/ubuntu-fan.service.
Setting up docker.io (24.0.7-0ubuntu2~22.04.1) ...
Adding group 'docker' (GID 122) ...
Done.
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /lib/systemd/system/docker.service.
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /lib/systemd/system/docker.socket.
Processing triggers for dbus (1.12.20-2ubuntu0.4.1) ...
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-14-125:~# docker --version
Docker version 24.0.7, build 24.0.7-0ubuntu2~22.04.1

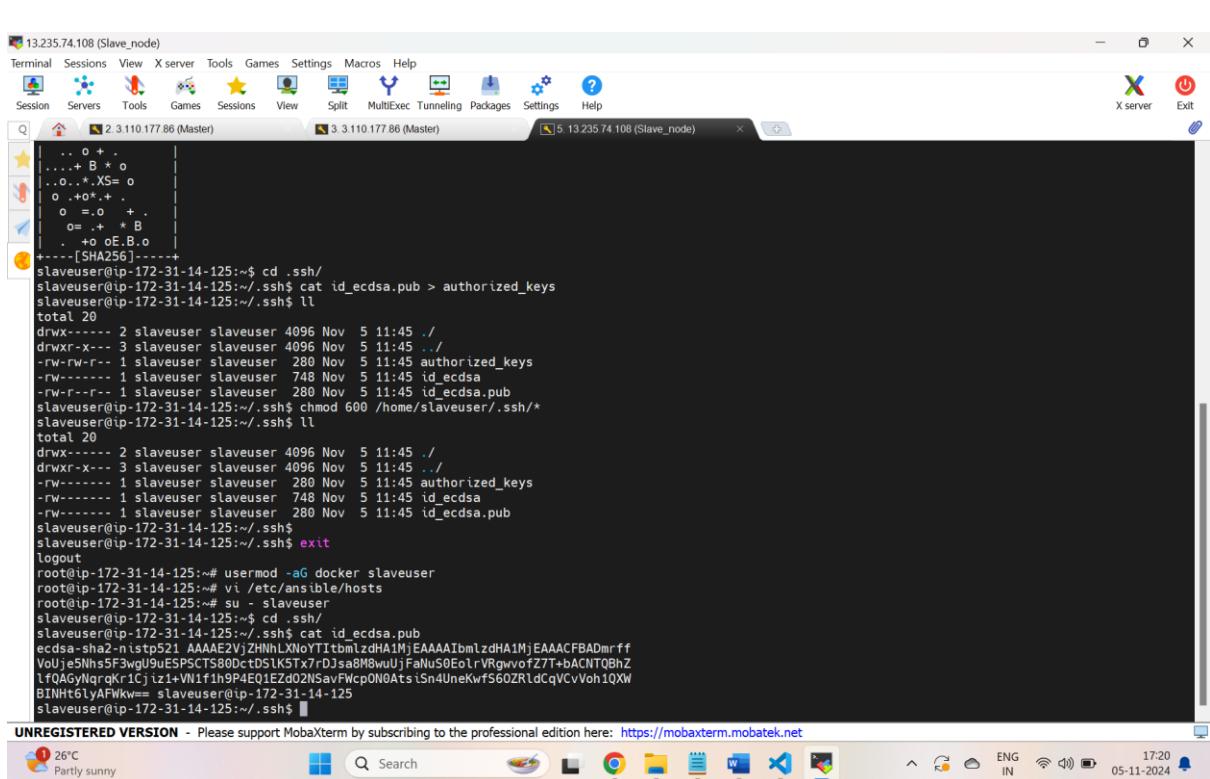
```

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```
root@ip-172-31-14-125:~# useradd slaveuser -s /bin/bash -m -d /home/slaveuser
root@ip-172-31-14-125:~# passwd slaveuser
New password:
Retype new password:
passwd: password updated successfully
root@ip-172-31-14-125:~# vi /etc/ssh/sshd_config
root@ip-172-31-14-125:~# service ssh reload
root@ip-172-31-14-125:~# visudo
root@ip-172-31-14-125:~# su - slaveuser
slaveuser@ip-172-31-14-125:~$ cd ..
slaveuser@ip-172-31-14-125:~$ exit
logout
root@ip-172-31-14-125:~# vi /etc/ssh/sshd_config
root@ip-172-31-14-125:~# service ssh reload
root@ip-172-31-14-125:~# visudo
visudo: /etc/sudoers.tmp unchanged
root@ip-172-31-14-125:~# su - slaveuser
slaveuser@ip-172-31-14-125:~$ ssh-keygen -t ecdsa -b 521
Generating public/private key pair.
Enter file in which to save the key (/home/slaveuser/.ssh/id_ecdsa):
Created directory '/home/slaveuser/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/slaveuser/.ssh/id_ecdsa
Your public key has been saved in /home/slaveuser/.ssh/id_ecdsa.pub
The key fingerprint is:
SHA256:4gbUgYFc941sHpJ46a1MRG3eeNDPImp+Nt/s4fFI54o slaveuser@ip-172-31-14-125
The key's randomart image is:
+---[ECDSA 521]---+
| . . .
| .. o +
| ...+ B * o
| . . . * X5= o
| o . +o* . +
| o = .o + .
| o= .+ * B
| .+o Oe.B.o
```

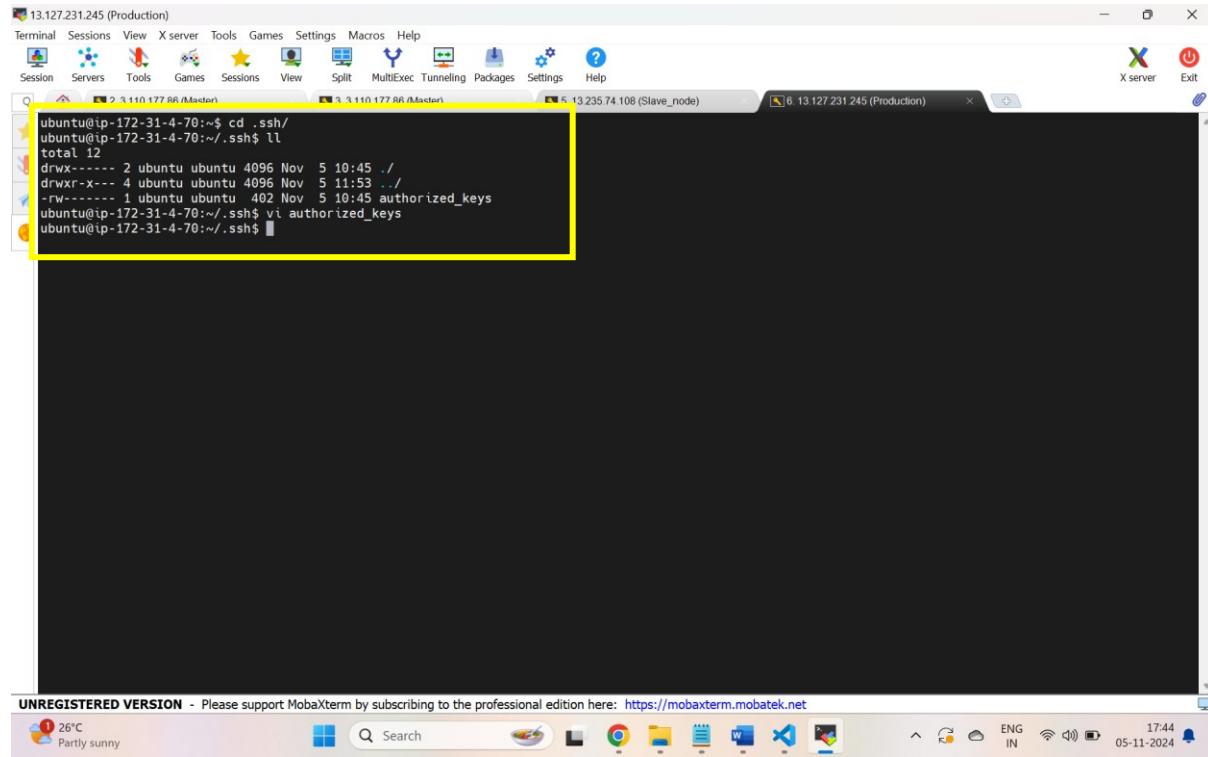
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```
... o +
...+ B * o
...*.X5= o
o .+o* .
o = .o +
o= .+ * B
.+.o Oe.B.o
+---[SHA256]---+
slaveuser@ip-172-31-14-125:~$ cd .ssh/
slaveuser@ip-172-31-14-125:~/ssh$ cat id_ecdsa.pub > authorized_keys
slaveuser@ip-172-31-14-125:~/ssh$ ll
total 20
drwx----- 2 slaveuser slaveuser 4096 Nov  5 11:45 .
drwxr-x--- 3 slaveuser slaveuser 4096 Nov  5 11:45 ..
-rw-r--r-- 1 slaveuser slaveuser 280 Nov  5 11:45 authorized_keys
-rw----- 1 slaveuser slaveuser 748 Nov  5 11:45 id_ecdsa
-rw-r--r-- 1 slaveuser slaveuser 280 Nov  5 11:45 id_ecdsa.pub
slaveuser@ip-172-31-14-125:~/ssh$ chmod 600 /home/slaveuser/.ssh/*
slaveuser@ip-172-31-14-125:~/ssh$ ll
total 20
drwx----- 2 slaveuser slaveuser 4096 Nov  5 11:45 .
drwxr-x--- 3 slaveuser slaveuser 4096 Nov  5 11:45 ..
-rw-r--r-- 1 slaveuser slaveuser 280 Nov  5 11:45 authorized_keys
-rw----- 1 slaveuser slaveuser 748 Nov  5 11:45 id_ecdsa
-rw----- 1 slaveuser slaveuser 280 Nov  5 11:45 id_ecdsa.pub
slaveuser@ip-172-31-14-125:~/ssh$ 
slaveuser@ip-172-31-14-125:~/ssh$ exit
logout
root@ip-172-31-14-125:~# usermod -aG docker slaveuser
root@ip-172-31-14-125:~# vi /etc/ansible/hosts
root@ip-172-31-14-125:~# su - slaveuser
slaveuser@ip-172-31-14-125:~$ cd .ssh/
slaveuser@ip-172-31-14-125:~/ssh$ cat id_ecdsa.pub
ecdsa-sha2-nistp521 AAAAE2VjZHNhLXN0YT1tbmlzdHA1MjEAAAIBmlzdHA1MjEAAACFBADmrff
VoUje5Nhns5F3wgU9eSPSCTS80DctDSLK5Tx7xDJsab8MBwuUjFaUs0Eo1rVrgwvfz77+baCNTQBhZ
lfQAGyNqrqK1Cjiz1+VM1f1n9P4EQ1EZd02N5avFwcpON0Ats1Sn4UneKwfS60ZRldCqVCvVoh1QW
BNHt6lyAFWkw== slaveuser@ip-172-31-14-125
slaveuser@ip-172-31-14-125:~/ssh$
```

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Step 7: Use MobaXterm to connect to the **Production_Server** instance via **SSH**, append your **public key** to the **authorized_keys** file. Ensure proper permissions to enable seamless access for **deployment** and management tasks.



Steps 8: Configure Jenkins credentials by following these steps:

- Navigate to the Jenkins Dashboard.
- Go to Manage Jenkins > Credentials.
- Add the Docker Hub credentials you obtained from your Docker Hub account.

The screenshot shows a 'Copy access token' dialog box on a Docker settings page. The dialog contains the following information:

- Access token description:** Project_Access_Token
- Access permissions:** Read, Write, Delete
- To use the access token from your Docker CLI client:**

 - Run: `$ docker login -u 12ayushi` (with a **Copy** button)
 - At the password prompt, enter the personal access token: `dckr_pat_y3ZB492WOWfE9K_G-rndaYBTd3E` (with a **Copy** button)

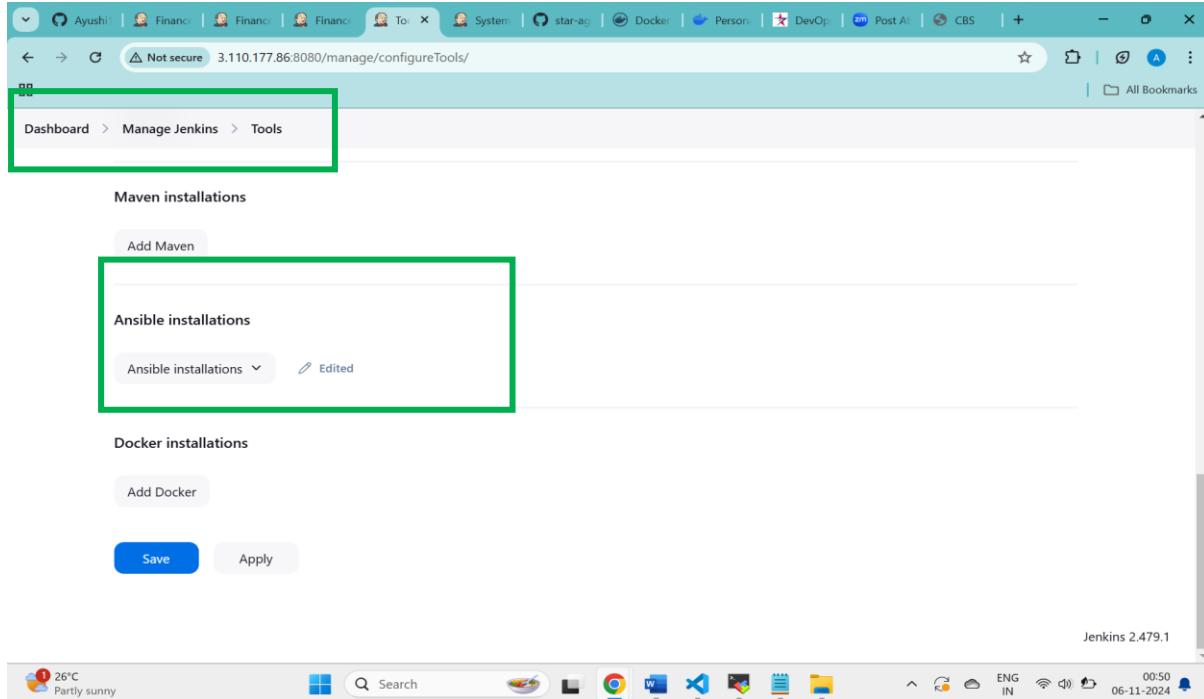
[Back to access tokens](#)

The screenshot shows a 'Update credentials' dialog box on a Jenkins management page. The dialog contains the following fields:

- Scope:** Global (Jenkins, nodes, items, all child items, etc)
- Username:** 12ayushi
- Treat username as secret:**
- Password:** Concealed (with a **Change Password** button)
- ID:** 12ayushi

Buttons: Save, Update, Delete, Move

Step 9: Configuring Ansible in Jenkins is important to enable **automation tasks** such as **configuration management** and **application deployment**. This ensures that Jenkins can use Ansible to manage **infrastructure** and **deploy applications** as part of the **CI/CD pipeline**.



Step 10: We set up one node as a **Jenkins agent (slave)**, which is vital for supporting distributed build and deployment processes. This node is responsible for tasks like building the application, creating Docker images, and executing tests, ensuring smooth coordination with the **Jenkins Master** and the **Production_Server** for efficient deployment and monitoring.

The screenshot shows the Jenkins configuration page for a slave node. The URL is 3.110.177.86:8080/computer/slave/configure. The left sidebar has 'Configure' selected. The main form has a pink rounded rectangle highlighting the 'Name' field ('slave'), the 'Description' field (empty), and the 'Number of executors' field ('2').

Dashboard > Nodes > slave > Configure

Name ?
slave

Description ?

Plain text [Preview](#)

Number of executors ?
2

Remote root directory ?

Save

This screenshot shows the same Jenkins configuration page, but with more fields visible after scrolling down. A pink rounded rectangle highlights the 'Remote root directory' field ('/home/slaveuser'), the 'Labels' field ('slave'), the 'Usage' dropdown ('Use this node as much as possible'), the 'Launch method' dropdown ('Launch agents via SSH'), the 'Host' field ('172.31.14.125'), and the 'Credentials' field.

Build Executor Status 0/2

Remote root directory ?
/home/slaveuser

Labels ?
slave

Usage ?
Use this node as much as possible

Launch method ?
Launch agents via SSH

Host ?
172.31.14.125

Credentials ?

Save

slaveuser

+ Add

Host Key Verification Strategy ?

Manually trusted key Verification Strategy

Require manual verification of initial connection ?

Advanced Edited

Availability ?

Keep this agent online as much as possible

Node Properties

Disable deferred wipeout on this node ?

Save

Ayushi | Finance | Finance | Finance | sla | System | star-ag | Docker | Person | DevOp | Post AI | CBS | +

Not secure 3.110.177.86:8080/computer/slave/configure

All Bookmarks

Dashboard > Nodes > slave > Configure

Nodes

+ New Node

Configure Monitors

Build Queue

No builds in the queue.

Build Executor Status

Built-In Node 0/2

slave 0/2

Nodes

S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
!	Built-In Node	Linux (amd64)	In sync	4.53 GiB	0 B	4.53 GiB	0ms
!	slave	Linux (amd64)	In sync	3.32 GiB	0 B	3.32 GiB	4ms

Data obtained 25 min 25 min 25 min 25 min 25 min 25 min

Icon: S M L

Legend

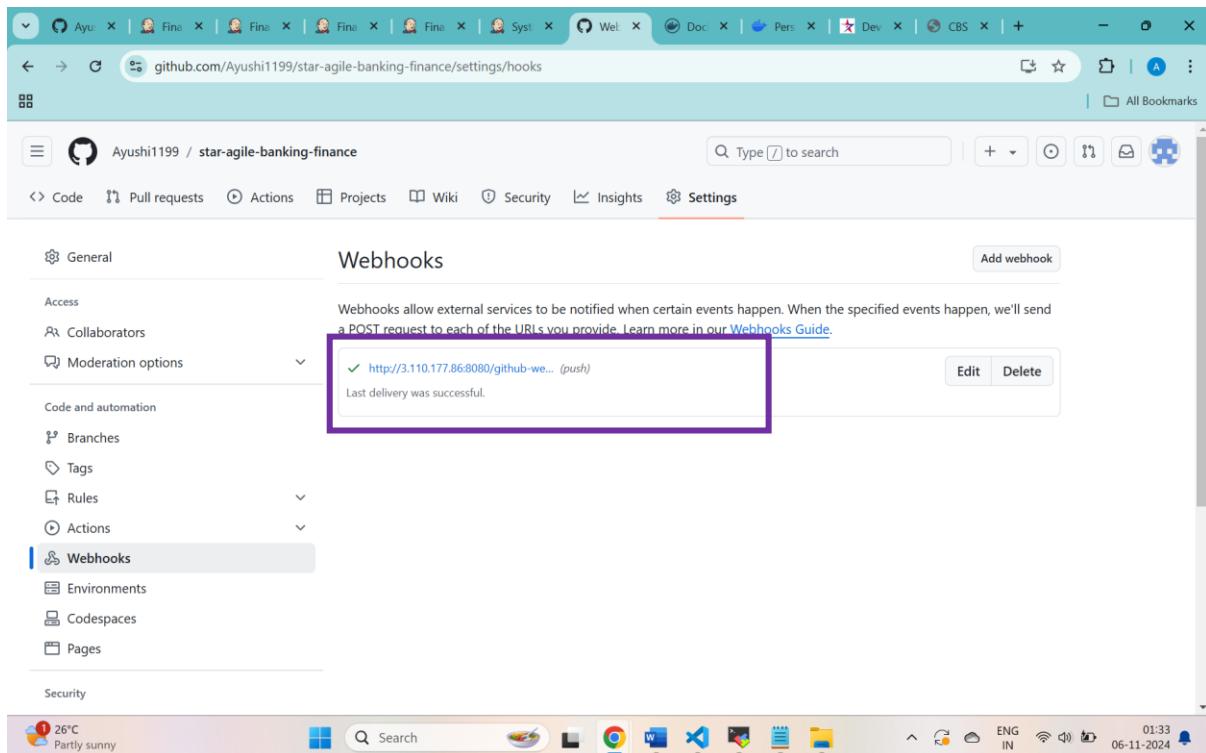
REST API Jenkins 2.479.1

26°C Partly sunny

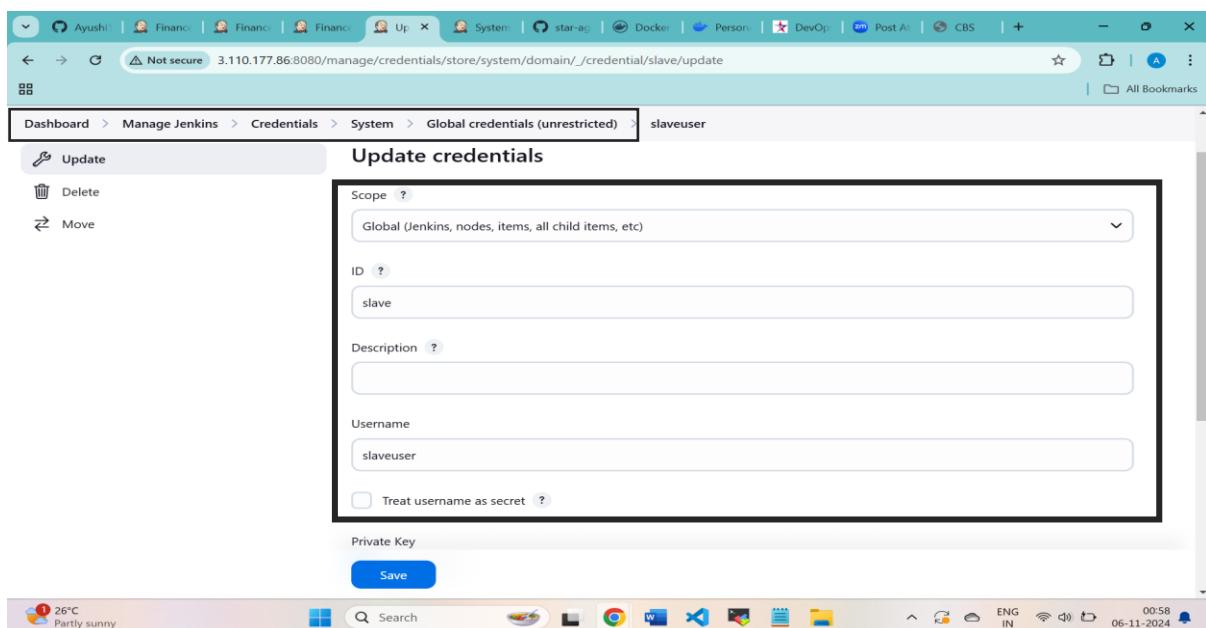
Search

ENG IN 06-11-2024 00:55

Step 11: Add GitHub webhooks to trigger the Jenkins pipeline automatically.



Step 12: We configured two additional credentials: **slaveuser** for communication between the **Jenkins Master** and **Slave nodes**, and **ansible** for **automated deployments**. These credentials ensure secure and efficient integration across the **CI/CD pipeline** and **deployment processes**.

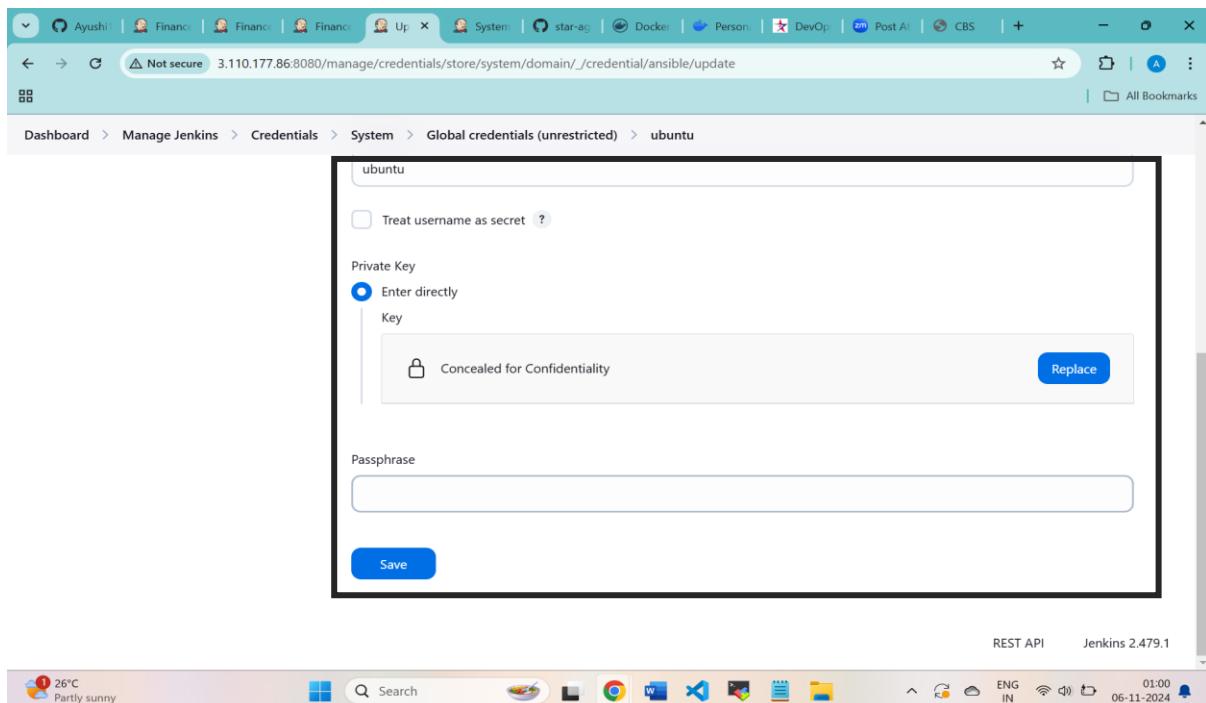


The screenshot shows a web browser window with the URL 3.110.177.86:8080/manage/credentials/store/system/domain/_/credential/slave/update. The page is titled "Global credentials (unrestricted) > slaveuser". It contains fields for "Username" (set to "slaveuser"), "Treat username as secret" (unchecked), "Private Key" (set to "Enter directly" and "Key" field is empty), and "Passphrase" (empty). A "Save" button is at the bottom. The entire form area is highlighted with a black border.



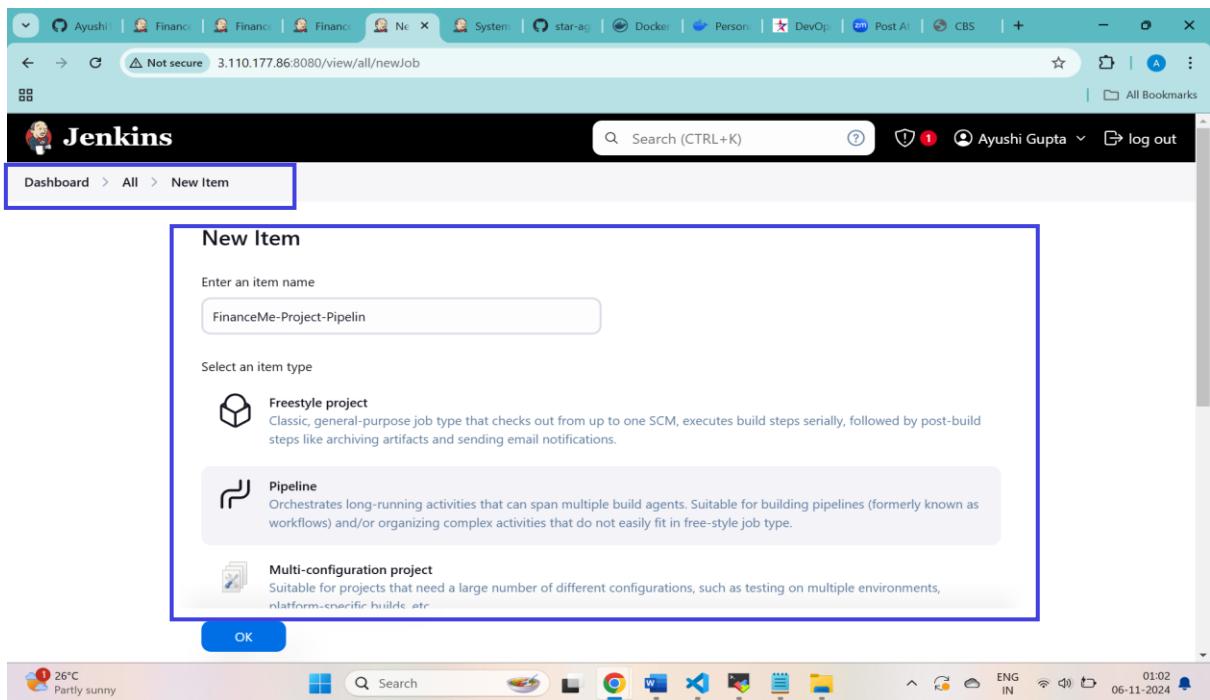
The screenshot shows a web browser window with the URL 3.110.177.86:8080/manage/credentials/store/system/domain/_/credential/ansible/update. The page is titled "Global credentials (unrestricted) > ubuntu". It contains fields for "Scope" (set to "Global (Jenkins, nodes, items, all child items, etc.)"), "ID" (set to "ansible"), "Description" (empty), "Username" (set to "ubuntu"), and a "Save" button. The "Scope" field is highlighted with a yellow box. The entire form area is highlighted with a black border.



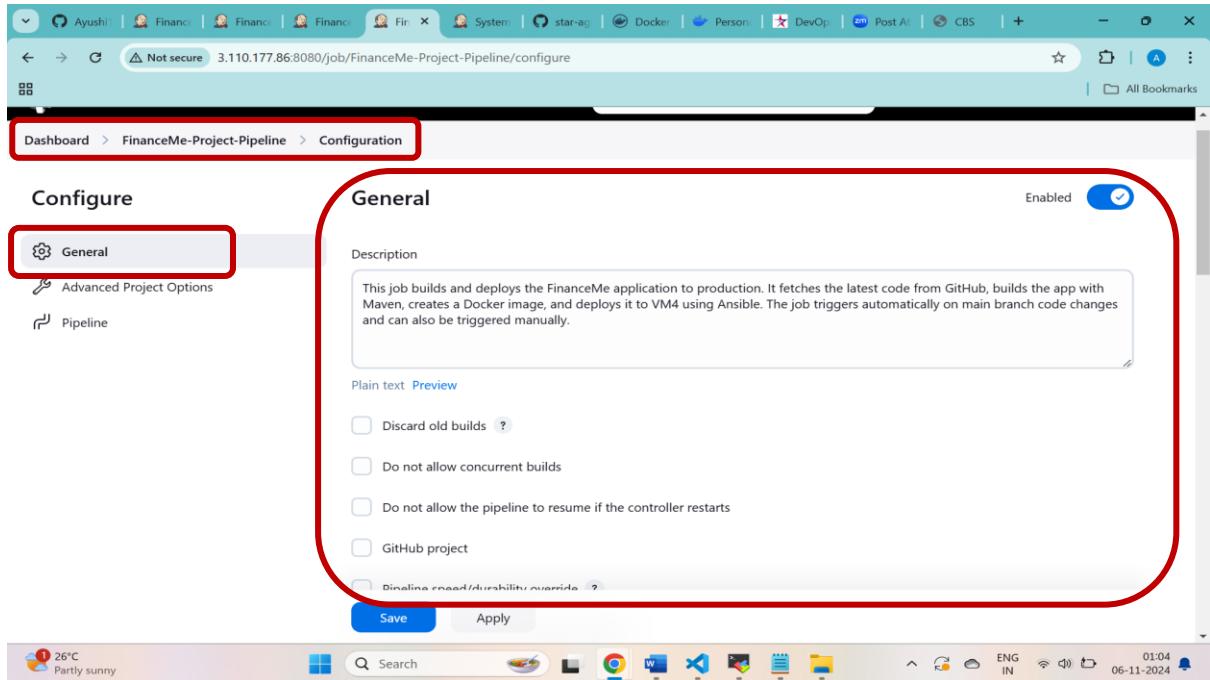


Step 13: Create a Jenkins Pipeline Job:

- Steps to Create a New Job:
 1. On the **Jenkins dashboard**, click **New Item**.
 2. Enter a job name (e.g., **FinanceMe-CICD-Pipeline**) and select **Pipeline**.
 3. Click **OK** and proceed to **configure the pipeline**.



Step 14: In the Jenkins configuration page, navigate to the **General** section and input the **pipeline script**. This step integrates the **pipeline configuration** with the previously set up **Jenkins Master** and **Slave nodes**, enabling the automation of build, test, and deployment tasks across the infrastructure.



The screenshot shows the Jenkins Pipeline configuration page for the 'FinanceMe-Project-Pipeline'. The 'General' tab is selected. The 'Build Triggers' section is highlighted with a red box. It contains several options:

- Build after other projects are built
- Build periodically
- GitHub hook trigger for GITScm polling
- Poll SCM

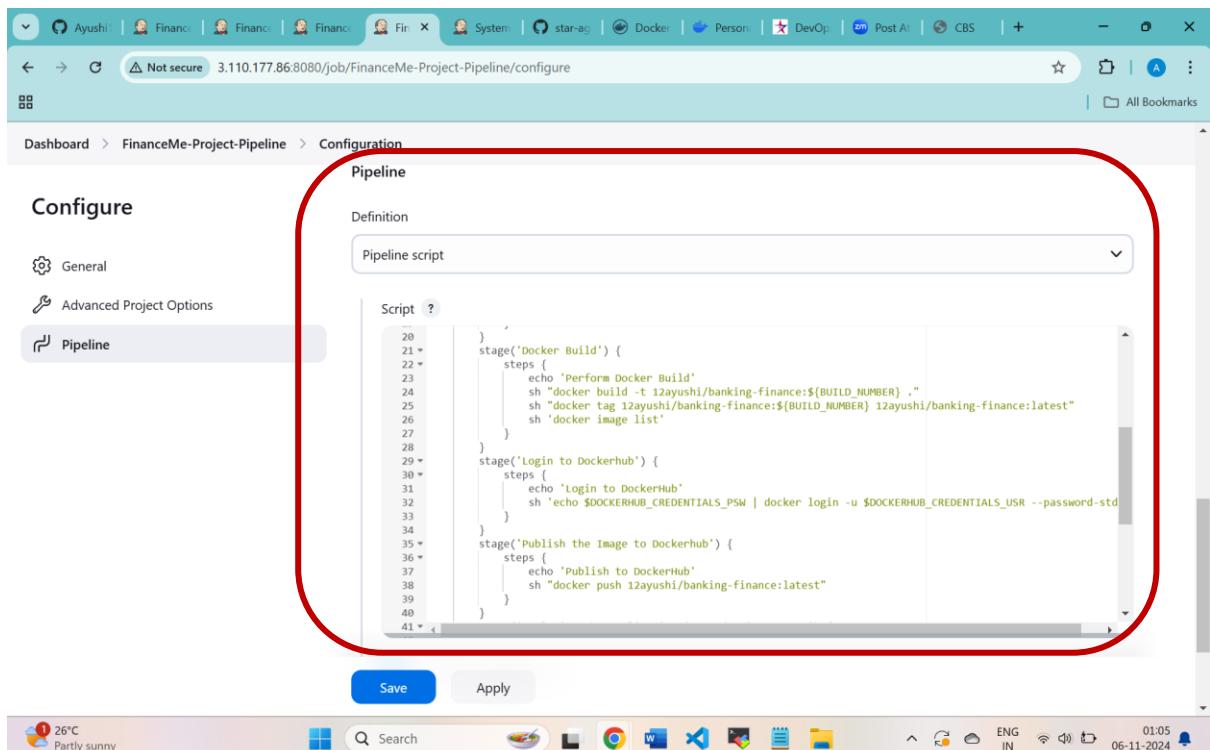
Below these options is a 'Schedule' field containing the value '*****'. A warning message is displayed: **⚠️ Do you really mean "every minute" when you say "*****"? Perhaps you meant "H * * * *"**. It also specifies the last run was on Tuesday, November 5, 2024 at 7:34:14 PM Coordinated Universal Time, and the next run is scheduled for the same time on the same day.

At the bottom of the 'Build Triggers' section are two buttons: 'Save' and 'Apply'.

The screenshot shows the Jenkins Pipeline configuration page for the 'FinanceMe-Project-Pipeline'. The 'Pipeline' tab is selected. The 'Definition' section is highlighted with a red box. It shows the 'Pipeline script' dropdown set to 'Pipeline script' and the script content:

```
1 pipeline {  
2     agent { label 'slave' }  
3  
4     environment {  
5         DOCKERHUB_CREDENTIALS = credentials('12ayushi')  
6     }  
7  
8     stages {  
9         stage('SCM_Checkout') {  
10            steps {  
11                echo 'Perform SCM Checkout'  
12                git 'https://github.com/Ayushii199/star-agile-banking-finance.git'  
13            }  
14        }  
15        stage('Application Build') {  
16            steps {  
17                echo 'Perform Application Build'  
18                sh 'mvn clean package'  
19            }  
20        }  
21        stage('Docker Build') {  
22            steps {  
23                echo 'Perform Docker Build'  
24            }  
25        }  
26    }  
27}
```

At the bottom of the 'Definition' section are two buttons: 'Save' and 'Apply'.

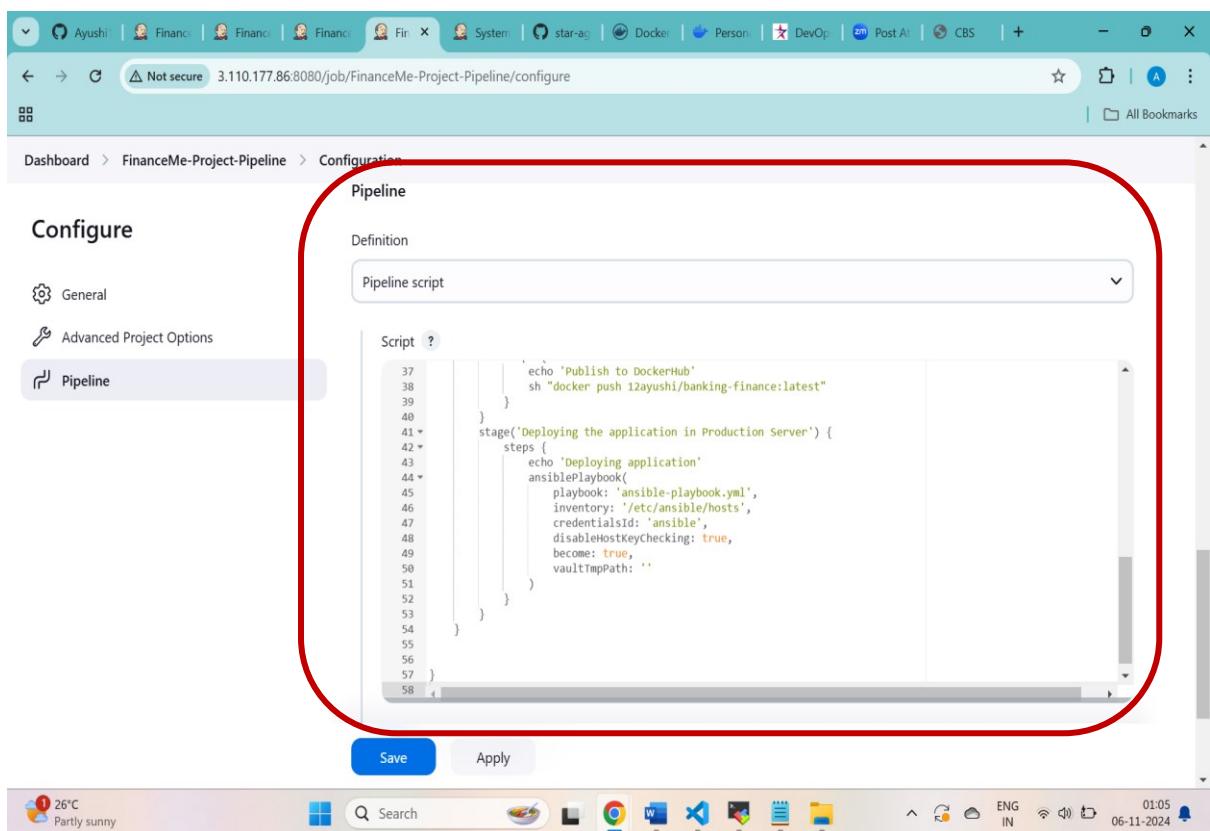


The screenshot shows a Jenkins pipeline configuration page. The pipeline script is as follows:

```
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38
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40
41
```

```
stage('Docker Build') {
    steps {
        echo 'Perform Docker Build'
        sh "docker build -t 12ayushi/banking-finance:${BUILD_NUMBER} ."
        sh "docker tag 12ayushi/banking-finance:${BUILD_NUMBER} 12ayushi/banking-finance:latest"
        sh 'docker image list'
    }
}
stage('Login to Dockerhub') {
    steps {
        echo 'Login to DockerHub'
        sh "echo $DOCKERHUB_CREDENTIALS_PSW | docker login -u $DOCKERHUB_CREDENTIALS_USR --password-stdin"
    }
}
stage('Publish the Image to Dockerhub') {
    steps {
        echo 'Publish to DockerHub'
        sh "docker push 12ayushi/banking-finance:latest"
    }
}
```

Below the script, there are 'Save' and 'Apply' buttons. The status bar at the bottom shows it's 01:05, ENG IN, and the date is 06-11-2024.



The screenshot shows a Jenkins pipeline configuration page. The pipeline script is as follows:

```
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53
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55
56
57
58
```

```
echo 'Publish to DockerHub'
sh "docker push 12ayushi/banking-finance:latest"
}
stage('Deploying the application in Production Server') {
    steps {
        echo 'Deploying application'
        ansiblePlaybook(
            playbook: 'ansible-playbook.yml',
            inventory: '/etc/ansible/hosts',
            credentialsId: 'ansible',
            disableHostKeyChecking: true,
            become: true,
            vaultTmpPath: ''
        )
    }
}
```

Below the script, there are 'Save' and 'Apply' buttons. The status bar at the bottom shows it's 01:05, ENG IN, and the date is 06-11-2024.

Ayushi | Finance | Finance | Finance | System | star-ag | Docker | Person | DevOp | Post A | CBS | +

Not secure 3.110.177.86:8080/job/FinanceMe-Project-Pipeline/

All Bookmarks

Dashboard > FinanceMe-Project-Pipeline >

</> Changes

▷ Build Now

⚙ Configure

Delete Pipeline

Stages

Rename

Pipeline Syntax

GitHub Hook Log

Git Polling Log

This job builds and deploys the FinanceMe application to production. It fetches the latest code from GitHub, builds the app with Maven, creates a Docker image, and deploys it to VM4 using Ansible. The job triggers automatically on main branch code changes and can also be triggered manually.

Permalinks

- Last build (#15), 1 hr 22 min ago
- Last stable build (#15), 1 hr 22 min ago
- Last successful build (#15), 1 hr 22 min ago
- Last failed build (#14), 4 hr 20 min ago
- Last unsuccessful build (#14), 4 hr 20 min ago
- Last completed build (#15), 1 hr 22 min ago

Builds

Filter

today

#15 6:14 PM

#14 3:17 PM

26°C Partly sunny

Search

ENG IN 01:07 06-11-2024

Banl | Ayu | Train | Am. | CBS | CPU | Pro. | Cha | Hist | Mic | Terr | +

Not secure 13.127.231.245:8085

All Bookmarks

Cial

HOME ABOUT SERVICES TEAM CONTACT US

CUSTOMER BANKING SERVICES

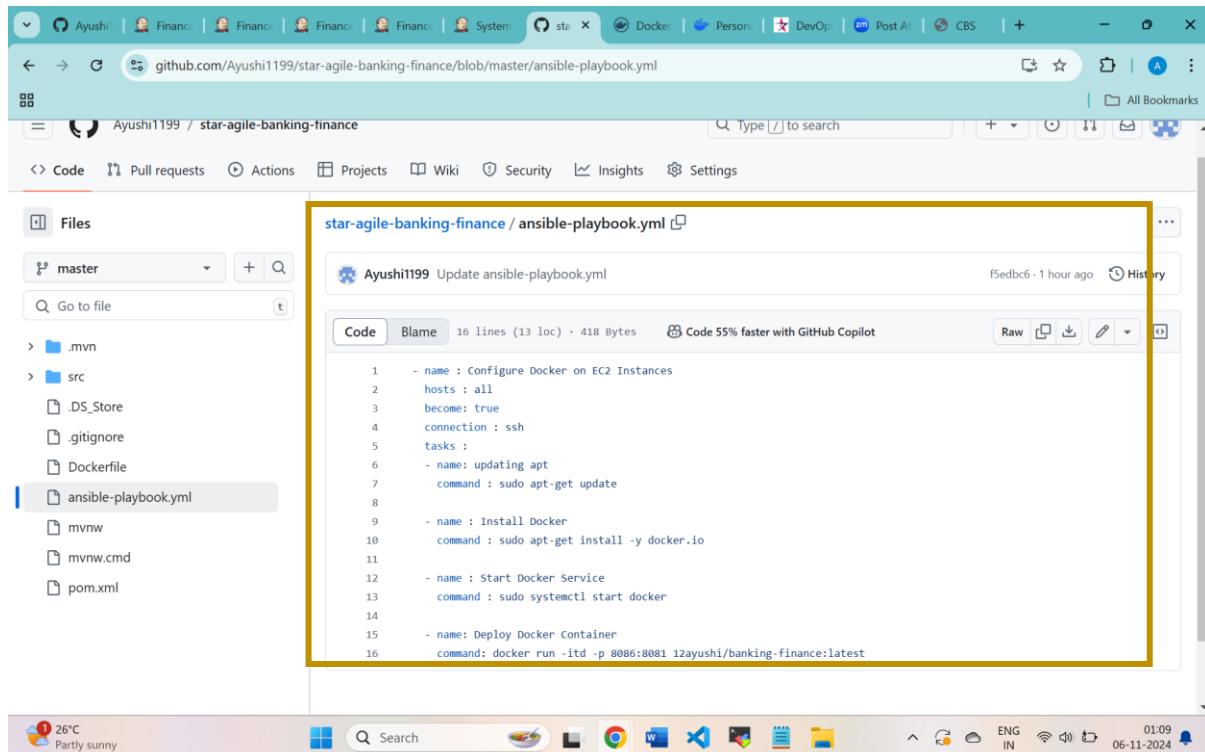
We provide the World's best in class Banking Solutions and Services.

26°C Partly sunny

Search

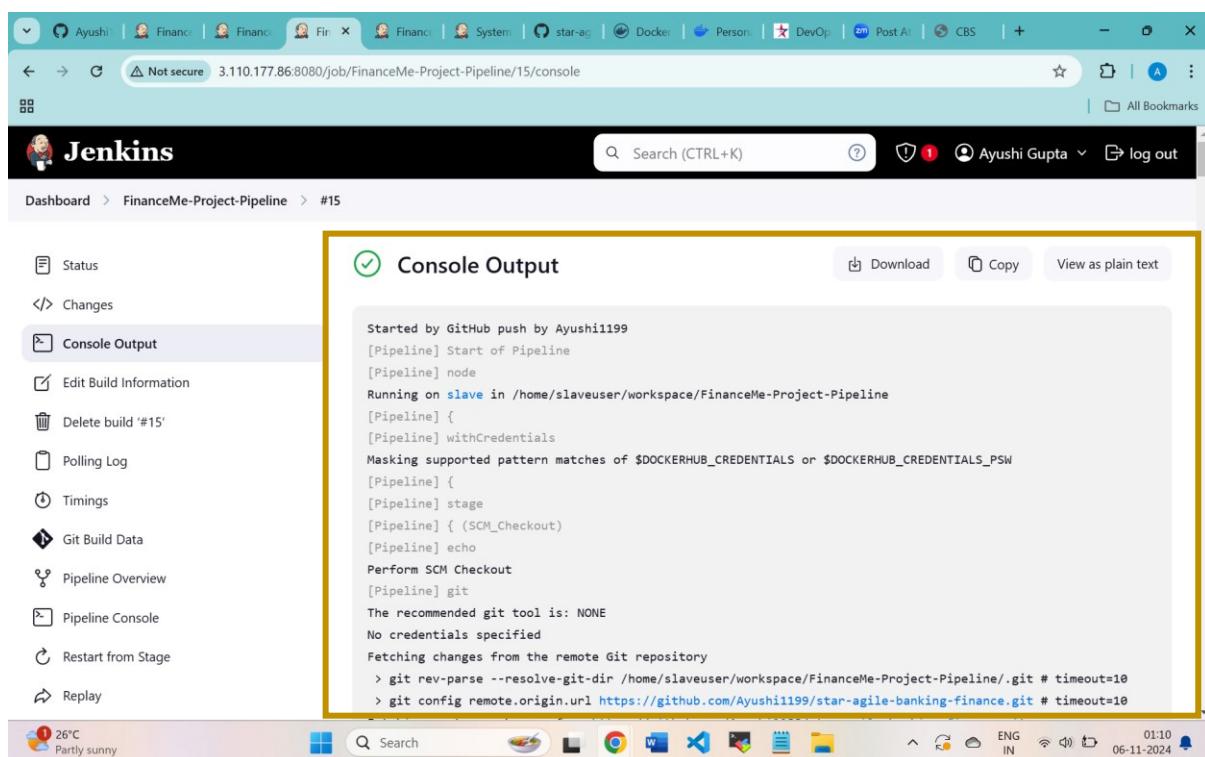
ENG IN 01:08 06-11-2024

Change port number to 8085 to 8086.



The screenshot shows a GitHub repository page for 'star-agile-banking-finance'. The 'Code' tab is selected, displaying the 'ansible-playbook.yml' file. The code content is as follows:

```
1 - name : Configure Docker on EC2 Instances
2 hosts : all
3 become: true
4 connection : ssh
5 tasks :
6   - name: updating apt
7     command : sudo apt-get update
8
9   - name : Install Docker
10    command : sudo apt-get install -y docker.io
11
12   - name : Start Docker Service
13    command : sudo systemctl start docker
14
15   - name: Deploy Docker Container
16    command: docker run -itd -p 8086:8081 12ayushi/banking-finance:latest
```



The screenshot shows a Jenkins pipeline job named 'FinanceMe-Project-Pipeline' with build number #15. The 'Console Output' tab is selected, displaying the following log entries:

```
Started by GitHub push by Ayushi1199
[Pipeline] Start of Pipeline
[Pipeline] node
Running on slave in /home/slaveuser/workspace/FinanceMe-Project-Pipeline
[Pipeline] {
[Pipeline] withCredentials
Masking supported pattern matches of $DOCKERHUB_CREDENTIALS or $DOCKERHUB_CREDENTIALS_PSW
[Pipeline] {
[Pipeline] stage
[Pipeline] { (SCM_Checkout)
[Pipeline] echo
Perform SCM Checkout
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
Fetching changes from the remote Git repository
> git rev-parse --resolve-git-dir /home/slaveuser/workspace/FinanceMe-Project-Pipeline/.git # timeout=10
> git config remote.origin.url https://github.com/Ayushi1199/star-agile-banking-finance.git # timeout=10
```

A screenshot of a Windows desktop showing a web browser window. The URL is 3.110.177.86:8080/job/FinanceMe-Project-Pipeline/15/console. The page displays the Jenkins pipeline console output. A yellow box highlights the terminal log:

```
TASK [updating apt] *****
changed: [172.31.4.70]

TASK [Install Docker] *****
changed: [172.31.4.70]

TASK [Start Docker Service] *****
changed: [172.31.4.70]

TASK [Deploy Docker Container] *****
changed: [172.31.4.70]

PLAY RECAP *****
172.31.4.70 : ok=5    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[Pipeline]
[Pipeline] // stage
[Pipeline]
[Pipeline] // withCredentials
[Pipeline]
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

The browser toolbar shows various icons for file operations, and the taskbar at the bottom includes the Start button, a search bar, and pinned application icons like File Explorer, Edge, and File History. The system tray shows the date and time as 06-11-2024.

A screenshot of a Windows desktop showing a web browser window. The URL is 3.110.177.86:8080/job/FinanceMe-Project-Pipeline/15/. The page displays the Jenkins pipeline build details. A yellow box highlights the build summary:

Build #15 (Nov 5, 2024, 6:14:13 PM)

Status: **Success** | Keep this build forever
Started 1 hr 11 min ago | Took 1 min 0 sec

Add description

Changes

- 1. Update ansible-playbook.yml ([details](#) / [githubweb](#))

Started by GitHub push by Ayushi1199

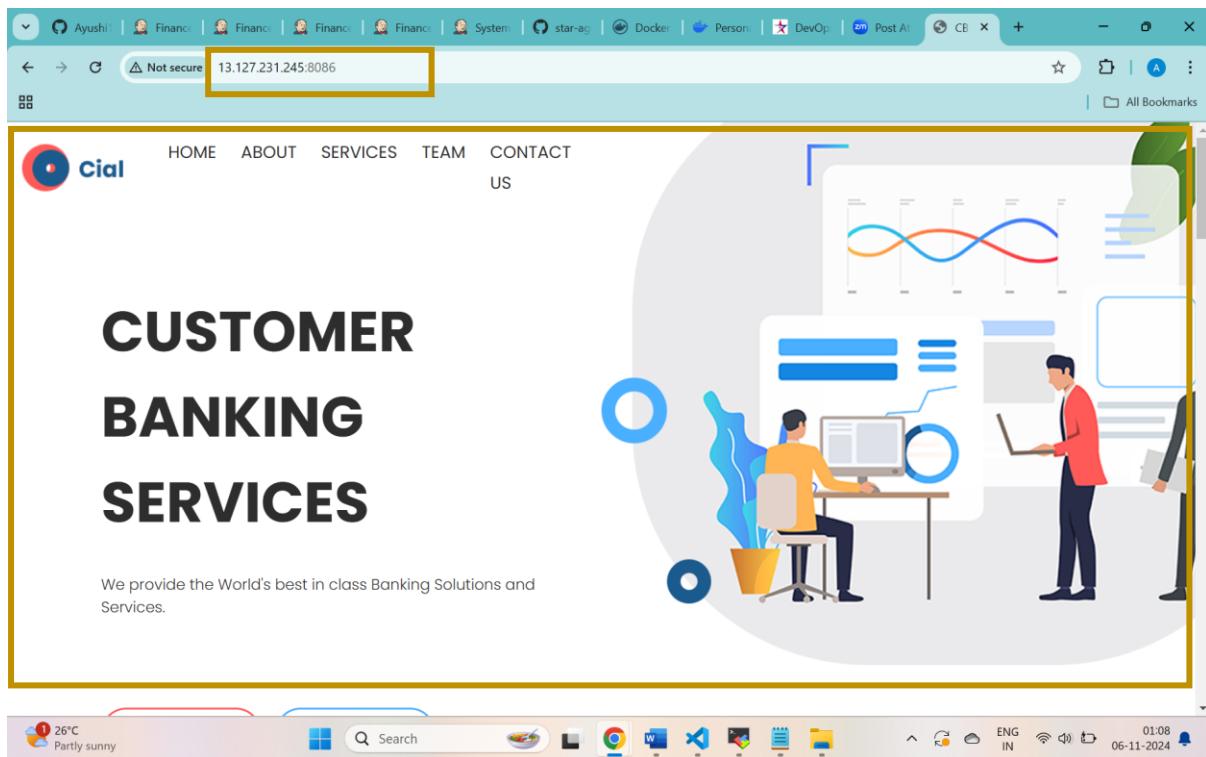
This run spent:

- 9.6 sec waiting;
- 1 min 0 sec build duration;
- 1 min 10 sec total from scheduled to completion.

git
Revision: f5edb6d6b631a13aa274dfba28fe0aa95563962
Repository: <https://github.com/Ayushi1199/star-agile-banking-finance.git>

The sidebar on the left lists navigation links: Status, Changes, Console Output, Edit Build Information, Delete build '#15', Polling Log, Timings, Git Build Data, Pipeline Overview, Pipeline Console, Restart from Stage, Replay, and Pipeline Steps.

The browser toolbar shows various icons for file operations, and the taskbar at the bottom includes the Start button, a search bar, and pinned application icons like File Explorer, Edge, and File History. The system tray shows the date and time as 06-11-2024.



Step 15: Use **MobaXterm** to connect to the **Monitoring_Server** instance via **SSH** and install the required tools on the instance (**Prometheus** and **Grafana**).

- Install Grafana

```

65.0.99.191 (Monitoring)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Session View Split MultiExec Tunnelling Packages Settings Help
Q 2 3.110.177.86 (Master) 3 3.110.177.86 (Master) 5 6.13.235.74.108 (Slave_node) 6 13.127.231.245 (Production) 11 65.0.99.191 (Monitoring)
root@ip-172-31-9-65:~# sudo apt-get install -y software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.22.9).
0 upgraded, 0 newly installed, 0 to remove and 16 not upgraded.
root@ip-172-31-9-65:~# sudo add-apt-repository "deb https://packages.grafana.com/oss/deb stable main"
Repository: 'deb https://packages.grafana.com/oss/deb stable main'
Description:
  Archive for codename: stable components: main
  More info: https://packages.grafana.com/oss/deb
  Adding repository...
Hit [ENTER] to continue or Ctrl+C to cancel.
Found existing deb entry in /etc/apt/sources.list.d/archive_uri-https_packages_grafana_com_oss_deb-jammy.list
Adding deb entry to /etc/apt/sources.list.d/archive_uri-https_packages_grafana_com_oss_deb-jammy.list
Found existing deb-src entry in /etc/apt/sources.list.d/archive_uri-https_packages_grafana_com_oss_deb-jammy.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/archive_uri-https_packages_grafana_com_oss_deb-jammy.list
Hit:1 http://ap-south-1.ec2.archive/ubuntu jammy InRelease
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get: https://packages.grafana.com/oss/deb stable InRelease [7660 B]
Hit:4 https://security.ubuntu.com/ubuntu jammy-security InRelease
Fetched 0 B in 0s (0 B/s).
The following signatures couldn't be verified because the public key is not available: NO_PUBKEY 963FA27710458545
Reading package lists... Done
W: GPG error: https://packages.grafana.com/oss/deb stable InRelease: The following signatures couldn't be verified because the public key is not available: NO_PUBKEY 963FA27710458545
E: The repository 'https://packages.grafana.com/oss/deb stable InRelease' is not signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
root@ip-172-31-9-65:~# wget -q -O - https://packages.grafana.com/gpg.key | sudo apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
root@ip-172-31-9-65:~# apt update -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease

```

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65.0.99.191 (Monitoring)

Terminal Sessions View X server Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help

X server Exit

N: See apt-secure(8) manpage for repository creation and user configuration details.
root@ip-172-31-9-65:~# wget -q -O - https://packages.grafana.com/gpg.key | sudo apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
root@ip-172-31-9-65:~# apt update -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 https://packages.grafana.com/oss/deb stable InRelease [7660 B]
Hit:5 https://security.ubuntu.com/ubuntu jammy-security InRelease
Get:6 https://packages.grafana.com/oss/deb stable/main amd64 Packages [309 kB]
Fetched 309 kB in 2s (127 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
16 packages can be upgraded. Run 'apt list --upgradable' to see them.
W: https://packages.grafana.com/oss/deb/dists/stable/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
root@ip-172-31-9-65:~# apt install -y grafana
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
 musl
The following NEW packages will be installed:
 grafana musl
0 upgraded, 2 newly installed, 0 to remove and 16 not upgraded.
Need to get 127 MB of archives.
After this operation, 470 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 musl amd64 1.2.2-4 [407 kB]
Get:2 https://packages.grafana.com/oss/deb stable/main amd64 grafana amd64 11.3.0 [126 MB]
Fetched 127 MB in 20s (641 kB/s)
Selecting previously unselected package musl:amd64.
(Reading database ... 65783 files and directories currently installed.)
Preparing to unpack .../musl_1.2.2-4_amd64.deb ...
Unpacking musl:amd64 (1.2.2-4) ...
Selecting previously unselected package grafana.
Preparing to unpack .../grafana_11.3.0_amd64.deb ...

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

26°C Partly sunny

Search

ENG IN 01:14 06-11-2024

65.0.99.191 (Monitoring)

Terminal Sessions View X server Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help

X server Exit

Adding new user 'grafana' (UID 1115) with group 'grafana' ...
Not creating home directory '/usr/share/grafana'.
NOT starting on installation, please execute the following statements to configure grafana to start automatically using systemd
sudo /bin/systemctl daemon-reload
sudo /bin/systemctl enable grafana-server
You can start grafana-server by executing
sudo /bin/systemctl start grafana-server
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...
Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-9-65:~# systemctl deamon-reload
Unknown command verb deamon-reload.
root@ip-172-31-9-65:~#
root@ip-172-31-9-65:~# systemctl start grafana-service
Failed to start grafana-service.service: Unit grafana-service.service not found.
root@ip-172-31-9-65:~# systemctl start grafana-server
root@ip-172-31-9-65:~# systemctl status grafana-server
● grafana-server.service - Grafana instance
 Loaded: loaded (/lib/systemd/system/grafana-server.service; disabled; vendor preset: enabled)
 Active: active (running) since Tue 2024-11-05 17:51:12 UTC; 9s ago
 Docs: <http://docs.grafana.org>
 Main PID: 5053 (grafana)
 Tasks: 10 (limit: 1130)
 Memory: 200.0M
 CPU: 2.621s
 CGroup: /system.slice/grafana-server.service
 └─5053 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana/grafana-server.pid --packaging=deb cfp

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ENG IN 01:15 06-11-2024

```
65.0.99.191 (Monitoring)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Q 2.3.110.177.86 (Master) 3.3.110.177.86 (Master) 5.13.235.74.108 (Slave_node) 6.13.127.231.245 (Production) 11.65.0.99.191 (Monitoring)
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-9-65:~# systemctl deamon-reload
Unknown command verb deamon-reload.
root@ip-172-31-9-65:~#
root@ip-172-31-9-65:~# systemctl start grafana-service
Failed to start grafana-service.service: Unit grafana-service.service not found.
root@ip-172-31-9-65:~# systemctl start grafana-server
root@ip-172-31-9-65:~# systemctl status grafana-server
● grafana-server.service - Grafana instance
   Loaded: loaded (/lib/systemd/system/grafana-server.service; disabled; vendor preset: enabled)
     Active: active (running) since Tue 2024-11-05 17:51:12 UTC; 9s ago
       Docs: http://docs.grafana.org
      Main PID: 5053 (grafana)
        Tasks: 10 (limit: 1130)
       Memory: 200.0M
          CPU: 2.621s
         CGroup: /system.slice/grafana-server.service
             └─5053 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana/grafana-server.pid --packaging=deb cf

Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=plugins.update.checker t=2024-11-05T17:51:20.009418904Z level=info msg="Update check succeeded" duration=1ms
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=grafana.update.checker t=2024-11-05T17:51:20.009596154Z level=info msg="Update check succeeded" duration=1ms
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=plugin.angulardetectorsprovider.dynamict t=2024-11-05T17:51:20.03464181Z level=info msg="Patterns up-to-date"
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=grafana-apiserver.t=2024-11-05T17:51:20.04569299Z level=info msg="Adding GroupVersion playlist.grafana"
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=grafana-apiserver.t=2024-11-05T17:51:20.046349947Z level=info msg="Adding GroupVersion featuretoggle"
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=grafana-apiserver.t=2024-11-05T17:51:20.047955816Z level=info msg="Adding GroupVersion iam.grafana"
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=plugin.installer.t=2024-11-05T17:51:20.619261679Z level=info msg="Installing plugin" pluginId=grafana
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=installer.fs.t=2024-11-05T17:51:20.735813179Z level=info msg="Downloaded and extracted grafana-loki"
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=plugins.registration.t=2024-11-05T17:51:20.800321811Z level=info msg="Plugin registered" pluginId=grafana
Nov 05 17:51:20 ip-172-31-9-65 grafana[5053]: logger=plugin.backgroundinstaller.t=2024-11-05T17:51:20.800475742Z level=info msg="Plugin successfully installed"
lines 1-21/21 (END)
```
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```

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```
65.0.99.191 (Monitoring)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Q 2.3.110.177.86 (Master) 3.3.110.177.86 (Master) 5.13.235.74.108 (Slave_node) 6.13.127.231.245 (Production) 11.65.0.99.191 (Monitoring)
root@ip-172-31-9-65:~# vi prometheus.yml
root@ip-172-31-9-65:~# ll
total 94140
drwx----- 5 root root 4096 Nov 5 19:51 .
drwxr-xr-x 20 root root 4096 Nov 5 17:33 ..
-rw-r--r-- 1 root root 3106 Oct 15 2021 .bashrc
-rw----- 1 root root 20 Nov 5 19:51 .lessshst
-rw-r--r-- 1 root root 161 Jul 9 2019 .profile
drwx----- 2 root root 4096 Nov 5 17:26 .ssh/
-rw-r--r-- 1 root root 0 Nov 5 17:32 .sudo_as_admin_successful
-rw----- 1 root root 2734 Nov 5 19:51 .viminfo
-rw-r--r-- 1 root root 165 Nov 5 17:30 wget-hsts
drwxr-xr-x 4 1001 127 4096 Nov 5 17:55 prometheus-2.48.0-rc.0.linux-amd64/
-rw-r--r-- 1 root root 96353225 Oct 17 2023 prometheus-2.48.0-rc.0.linux-amd64.tar.gz
-rw-r--r-- 1 root root 2 Nov 5 19:51 prometheus.yml
drwx----- 4 root root 4096 Nov 5 17:26 snap/
root@ip-172-31-9-65:~# cd prometheus-2.48.0-rc.0.linux-amd64/
root@ip-172-31-9-65:~/prometheus-2.48.0-rc.0.linux-amd64# ls
LICENSE NOTICE console_libraries consoles prometheus prometheus.yml promtool
root@ip-172-31-9-65:~/prometheus-2.48.0-rc.0.linux-amd64# vi prometheus.yml
root@ip-172-31-9-65:~/prometheus-2.48.0-rc.0.linux-amd64#
```

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A screenshot of the MobaXterm application window titled "65.0.99.191 (Monitoring)". The terminal session displays a configuration file named "prometheus.yml". The file contains various Prometheus configuration options such as scrape intervals, alerting rules, and static configurations for jobs like "prometheus" and "node\_exporter". The terminal window has tabs for multiple sessions and includes standard window controls (minimize, maximize, close) and a toolbar with icons for Session, Servers, Tools, Games, Sessions, View, Split, MultiExec, Tunneling, Packages, Settings, and Help.

```
my global config
global:
 scrape_interval: 15s # Set the scrape interval to every 15 seconds. Default is every 1 minute.
 evaluation_interval: 15s # Evaluate rules every 15 seconds. The default is every 1 minute.
 # scrape_timeout is set to the global default (10s).

Alertmanager configuration
alerting:
 alertmanagers:
 - static_configs:
 - targets:
 # - alertmanager:9093

Load rules once and periodically evaluate them according to the global 'evaluation_interval'.
rule_files:
 # - "first_rules.yml"
 # - "second_rules.yml"

A scrape configuration containing exactly one endpoint to scrape:
Here it's Prometheus itself.
scrape_configs:
 # The job name is added as a label `job=<job_name>` to any timeseries scraped from this config.
 - job_name: "prometheus"

 # metrics_path defaults to '/metrics'
 # scheme defaults to 'http'.

 static_configs:
 - targets: ["localhost:9090"]

 - job_name: 'node_exporter'
 static_configs:
 - targets: ['172.31.4.70:9100']
 - targets: ['172.31.14.125:9100']

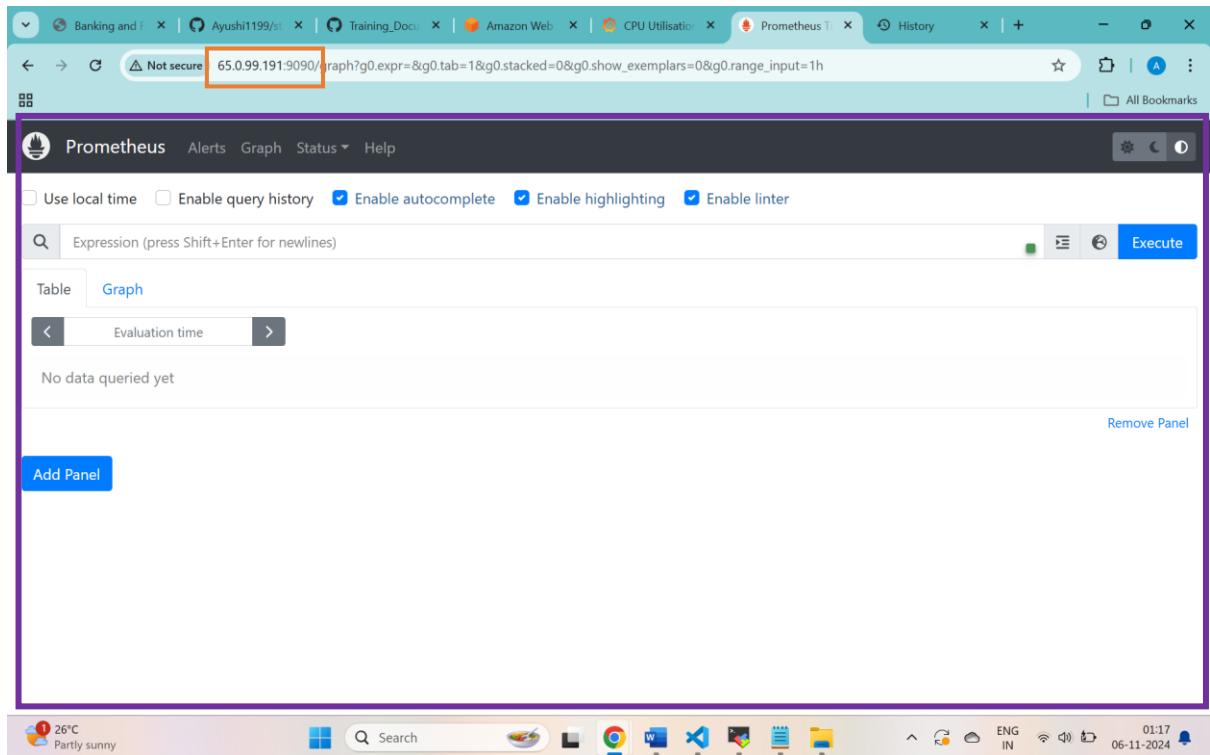
 ~
"prometheus.yml" 35L, 1064B
```

Access Grafana on [http://<monitoring\\_server\\_public\\_ip>:3000](http://<monitoring_server_public_ip>:3000)

A screenshot of a web browser window displaying the Grafana landing page. The URL bar shows "65.0.99.191:3000/?from=now-6h&to=now&timezone=browser". The page features a "Welcome to Grafana" header and a "Need help?" section with links to Documentation, Tutorials, Community, and Public Slack. On the left, there is a "Basic" sidebar with a "TUTORIAL DATA SOURCE AND DASHBOARDS" section titled "Grafana fundamentals" which describes setting up and understanding Grafana. Below this are sections for "Dashboards" and "Latest from the blog". The browser interface includes a toolbar at the top and bottom with standard icons and system status indicators.



Access Prometheus on `http://<monitoring_server_public_ip>:9090`.



**Step 16:** Next, install and configure **node\_exporter** on both the **Jenkins Slave** and **Production Server** to gather system metrics. This allows **Prometheus** to collect data for **monitoring the system's performance**. The data will then be **visualized in Grafana**, helping to track and monitor the entire **CI/CD pipeline and deployment process** effectively.

```

13.235.74.108 (Slave_node)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
curl -O https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_exporter-1.4.0-rc.0.linux-amd64.tar.gz
2024-11-05 17:17:53 --> https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_exporter-1.4.0-rc.0.linux-amd64.tar.gz
Resolving github.com (github.com)... 20.207.73.82
Connecting to github.com (github.com)[20.207.73.82]:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/9524057/8a22ea2a-4a82-412b-b6f5-e6ba22d04512?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20241105%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20241105T171555Z&X-Amz-Expires=300&X-Amz-Signature=a94bf2e39fc0dac7474654abbe673501e74c713ad6ddc4db943b9f5a5380d79f&X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Dnode_exporter-1.4.0-rc.0.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream [following]
--2024-11-05 17:17:53-- https://objects.githubusercontent.com/github-production-release-asset-2e65be/9524057/8a22ea2a-4a82-412b-b6f5-e6ba22d04512?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20241105%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20241105T171555Z&X-Amz-Expires=300&X-Amz-Signature=a94bf2e39fc0dac7474654abbe673501e74c713ad6ddc4db943b9f5a5380d79f&X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Dnode_exporter-1.4.0-rc.0.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.108.133, 185.199.110.133, 185.199.109.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)[185.199.108.133]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 9735268 (9.3M) [application/octet-stream]
Saving to: 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz' [100% ==> 9735268/9735268]

2024-11-05 17:17:55 (114 MB/s) - 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz' saved [9735268/9735268]

root@ip-172-31-14-125:~# tar -zvxf node_exporter-1.4.0-rc.0.linux-amd64.tar.gz
node_exporter-1.4.0-rc.0.linux-amd64/
node_exporter-1.4.0-rc.0.linux-amd64/LICENSE
node_exporter-1.4.0-rc.0.linux-amd64/NOTICE
node_exporter-1.4.0-rc.0.linux-amd64/node_exporter
root@ip-172-31-14-125:~# sudo vi /etc/systemd/system/node_exporter.service
root@ip-172-31-14-125:~# systemctl daemon-reload
root@ip-172-31-14-125:~# systemctl start node_exporter
root@ip-172-31-14-125:~# systemctl status node_exporter
● node_exporter.service - Prometheus Server
 Loaded: loaded (/etc/systemd/system/node_exporter.service; disabled; vendor preset: enabled)
 Active: active (running) since Tue 2024-11-05 15:42:35 UTC; 1h 36min ago
 Docs: https://prometheus.io/docs/introduction/overview/
 Main PID: 9516 (node_exporter)
 Tasks: 3 (limit: 1130)
 Memory: 2.2M
 CPU: 0.000 CPU(s) since start
 CPU: 0.000 CPU(s) since start
 CGroup: /system.slice/node_exporter.service
 └─9516 /root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

root@ip-172-31-14-125:~#
```

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```

[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure
ExecStart=/root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

[Install]
WantedBy=multi-user.target
```

"/etc/systemd/system/node\_exporter.service" 13L, 275B

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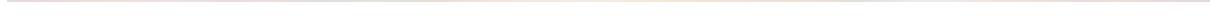


```
[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure
ExecStart=/root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

[Install]
WantedBy=multi-user.target
```

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```
node_exporter-1.4.0-rc.0.linux-amd64.tgz 100%[=====] 9.28M --.-KB/s in 0.1s
2024-11-05 17:15:57 (89.7 MB/s) - 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz' saved [9735268/9735268]

root@ip-172-31-4-70:~# tar -xvzf node_exporter-1.4.0-rc.0.linux-amd64.tar.gz
node_exporter-1.4.0-rc.0.linux-amd64/LICENSE
node_exporter-1.4.0-rc.0.linux-amd64/NOTICE
node_exporter-1.4.0-rc.0.linux-amd64/node_exporter
root@ip-172-31-4-70:~# sudo vi /etc/systemd/system/node_exporter.service
root@ip-172-31-4-70:~# systemctl start node_exporter
Warning: The unit file, source configuration file or drop-ins of node_exporter.service changed on disk. Run 'systemctl daemon-reload' to reload units.
root@ip-172-31-4-70:~# systemctl daemon-reload
root@ip-172-31-4-70:~# systemctl start node_exporter
root@ip-172-31-4-70:~# systemctl status node_exporter
● node_exporter.service - Prometheus Server
 Loaded: loaded (/etc/systemd/system/node_exporter.service; disabled; vendor preset: enabled)
 Active: active (running) since Tue 2024-11-05 15:47:17 UTC; 1h 30min ago
 Docs: https://prometheus.io/docs/introduction/overview/
 Main PID: 5902 (node_exporter)
 Tasks: 3 (limit: 1130)
 Memory: 2.2M
 CPU: 13ms
 CGroup: /system.slice/node_exporter.service
 └─5902 /root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=thermal_zone
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=time
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=timex
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=udp_queues
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=uname
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=vmstat
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=xfs
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:115 level=info collector=zfs
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.513Z caller=node_exporter.go:199 level=info msg="Listening on" address=:9100
Nov 05 15:47:17 ip-172-31-4-70 node_exporter[5902]: ts=2024-11-05T15:47:17.514Z caller=tls_config.go:195 level=info msg="TLS is disabled." http2=false
root@ip-172-31-4-70:~# systemctl daemon-reload
```

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**Step 17:** Navigate to the **Prometheus dashboard** and run the "up" command to check the status of Prometheus targets. This ensures that **node\_exporter** is correctly registered on the **Jenkins Slave** and **Production Server**, confirming that system metrics are being collected and integrated properly for monitoring.

| Series                                                 | Value |
|--------------------------------------------------------|-------|
| up{instance='172.31.14.125:9100', job='node_exporter'} | 1     |
| up{instance='172.31.4.70:9100', job='node_exporter'}   | 1     |
| up{instance='localhost:9090', job='prometheus'}        | 1     |



| Endpoint                          | State | Labels                                               | Last Scrape | Scrape Duration | Error |
|-----------------------------------|-------|------------------------------------------------------|-------------|-----------------|-------|
| http://172.31.14.125:9100/metrics | UP    | instance="172.31.14.125:9100"<br>job="node exporter" | 6.49s ago   | 12.489ms        |       |
| http://172.31.4.70:9100/metrics   | UP    | instance="172.31.4.70:9100"<br>job="node exporter"   | 7.695s ago  | 12.436ms        |       |
| http://localhost:9090/metrics     | UP    | instance="localhost:9090"<br>job="prometheus"        | 14.11s ago  | 4.373ms         |       |



**Step 18:** Navigate to the **Grafana dashboard** and run the necessary queries to visualize the system metrics collected by **Prometheus** from the **Jenkins Slave** and **Production Server**. This step will allow you to monitor key performance indicators and ensure the data integration is working as expected, offering a **visual representation** of your entire **CI/CD pipeline and infrastructure's health**.

