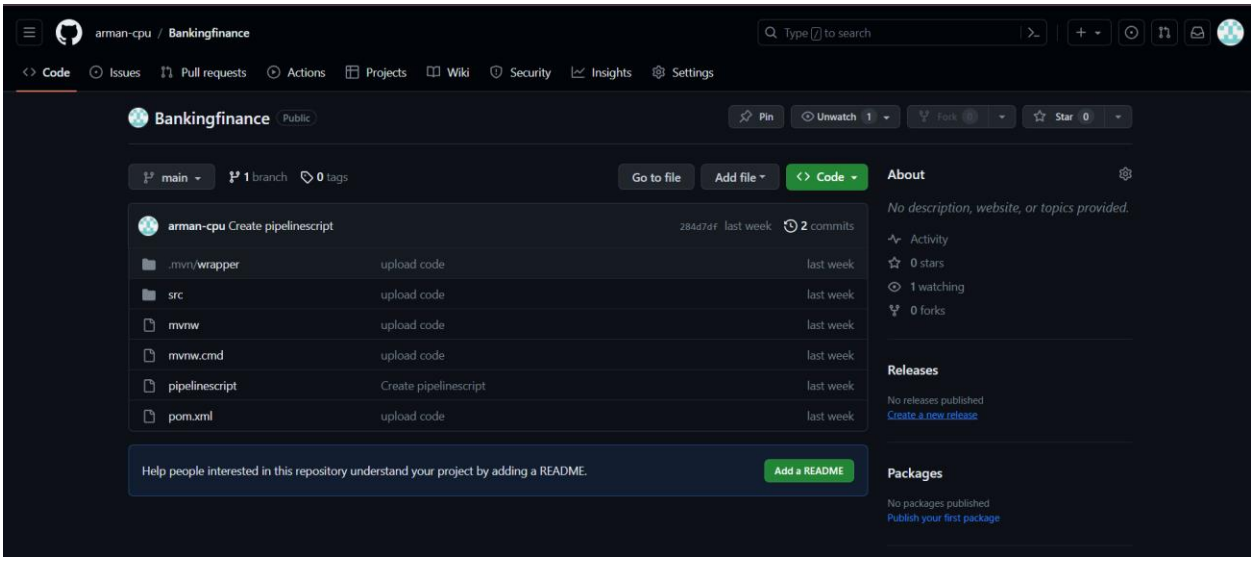
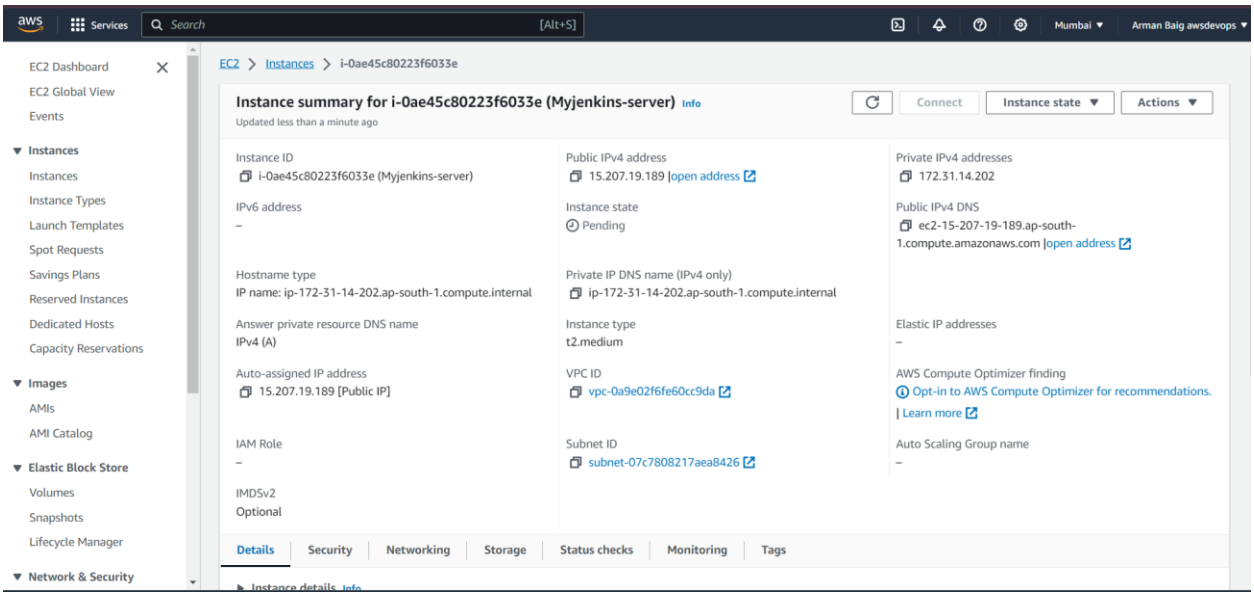
Certification Project – Finance Me

Banking and Finance Domain

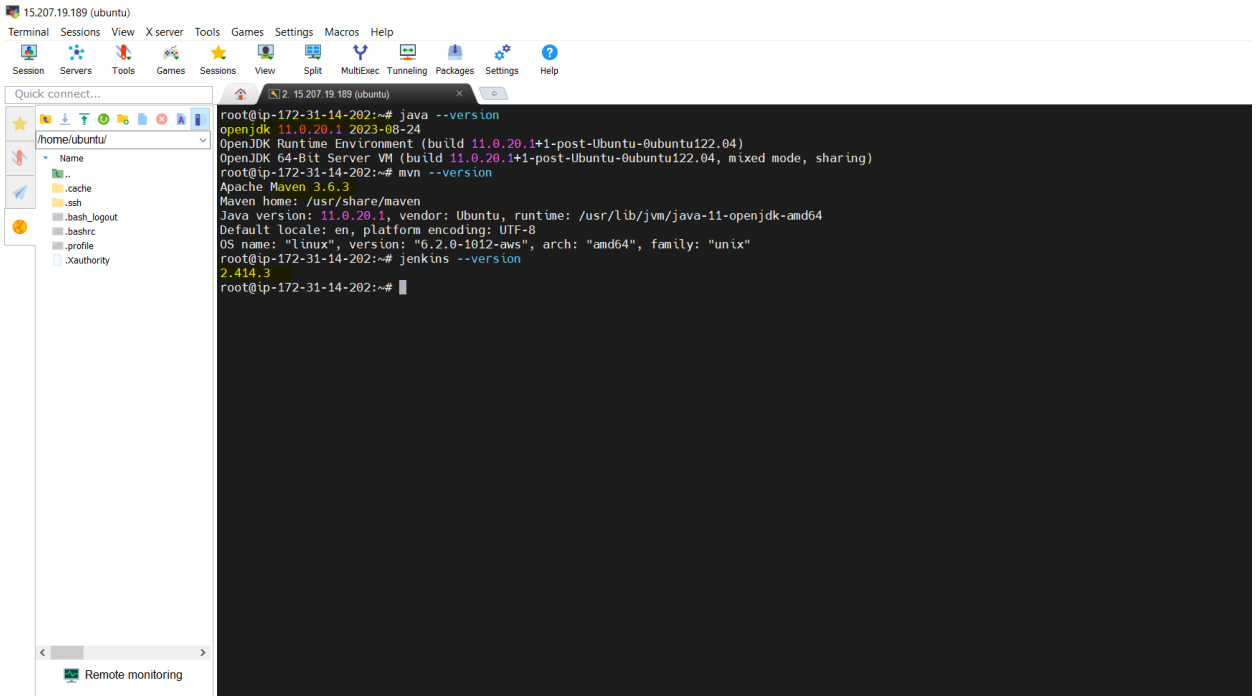
- Using Git - For version control for tracking changes in the code files and uploading the code to git hub repo.



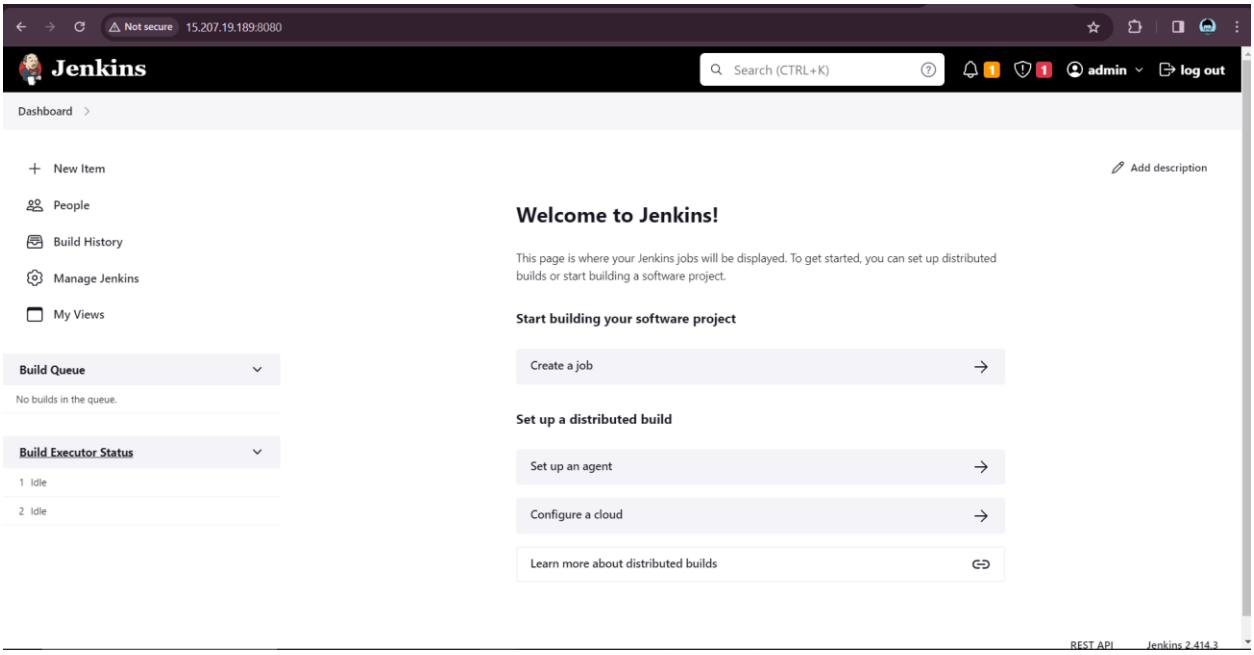
- Creating a Ec2 instance of type t2-medium of 25gb



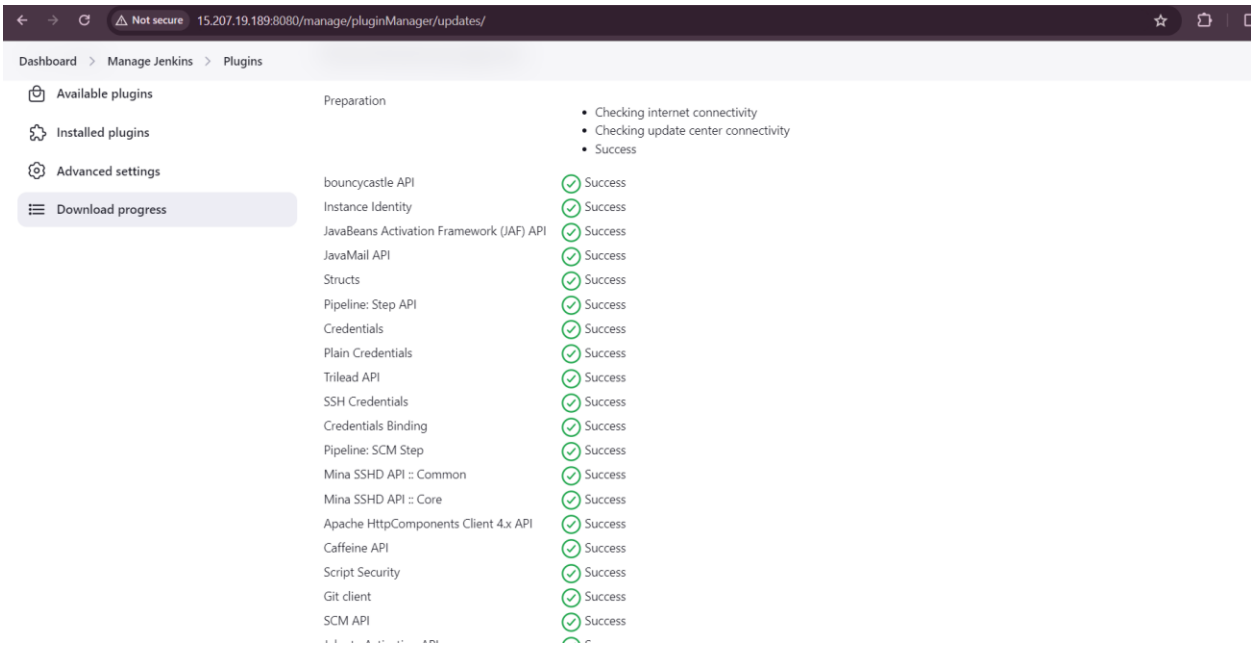
- Installing JAVA , MAVEN and jenkins in ec2 instance .



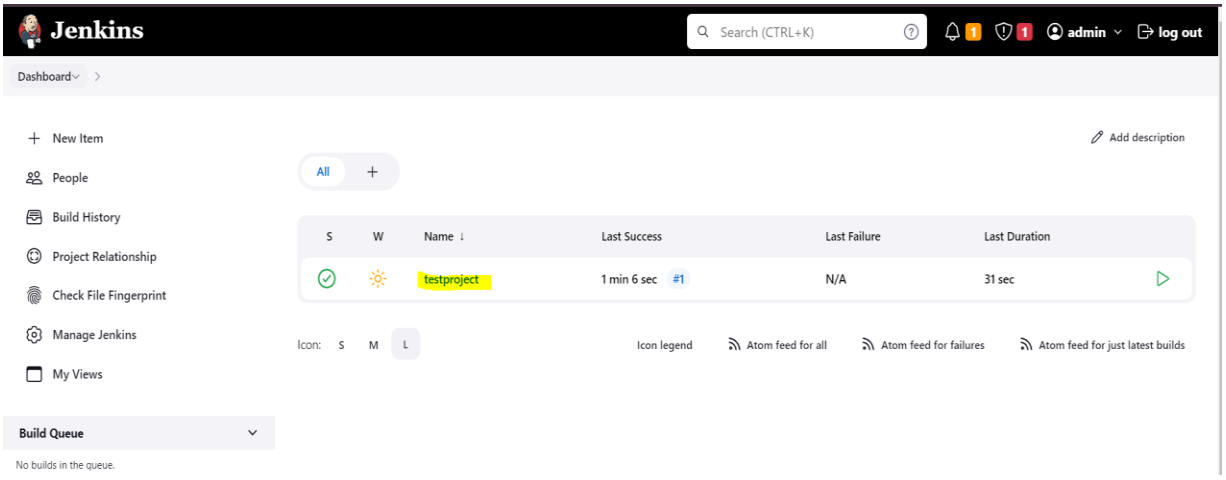
- Launching jenkins on port 8080 by installing recquired plugins .



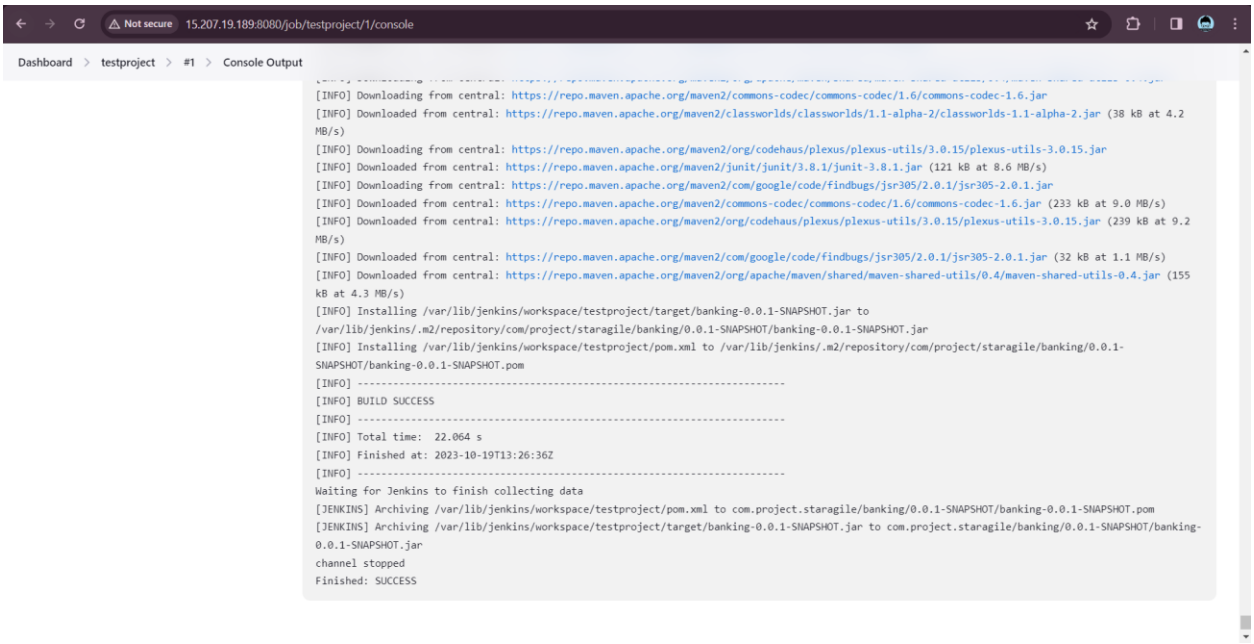
- Installing recquired plugins for the jenkins.



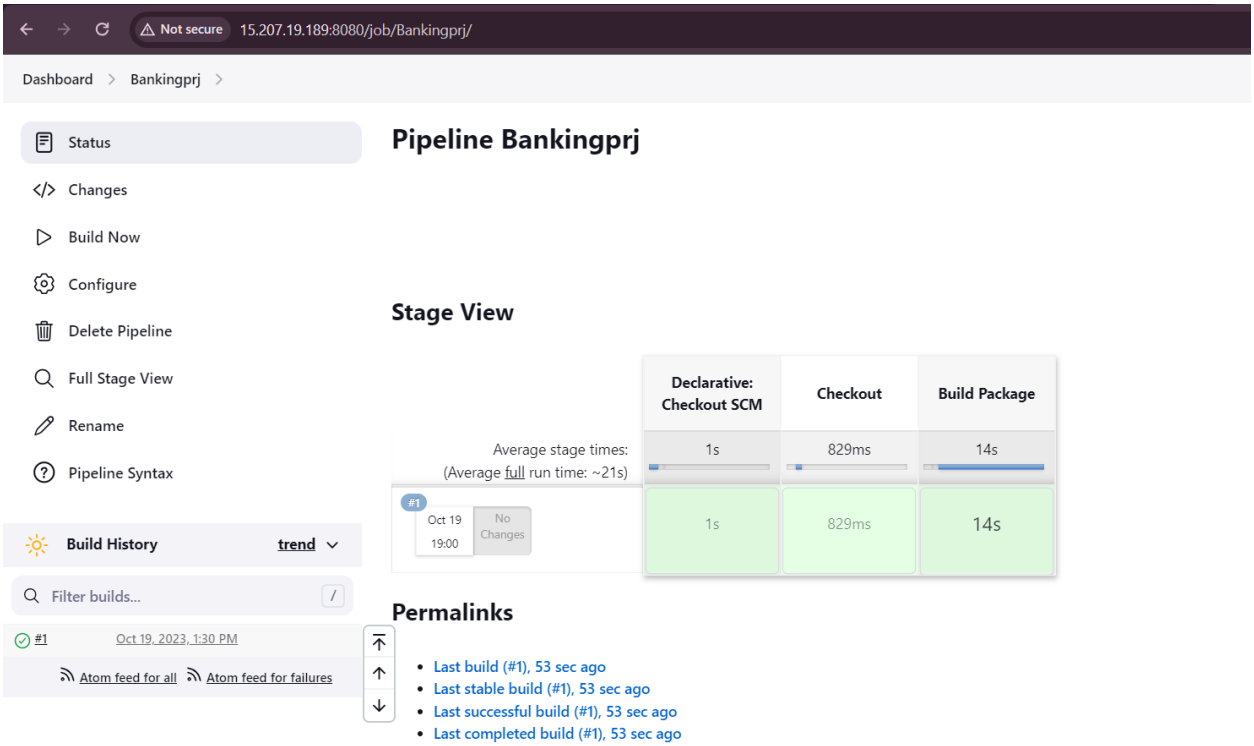
- Creating a dummy job to test & verifying that everything is fine to proceed further .



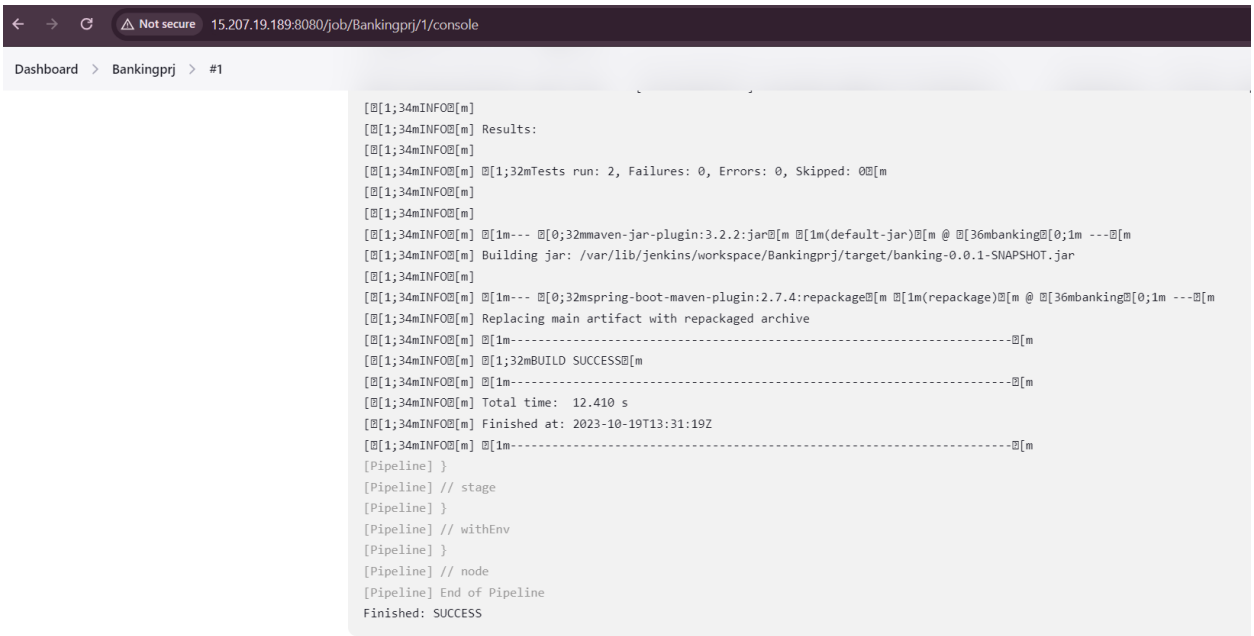
- Verifying the console output for the dummy job which we have created .



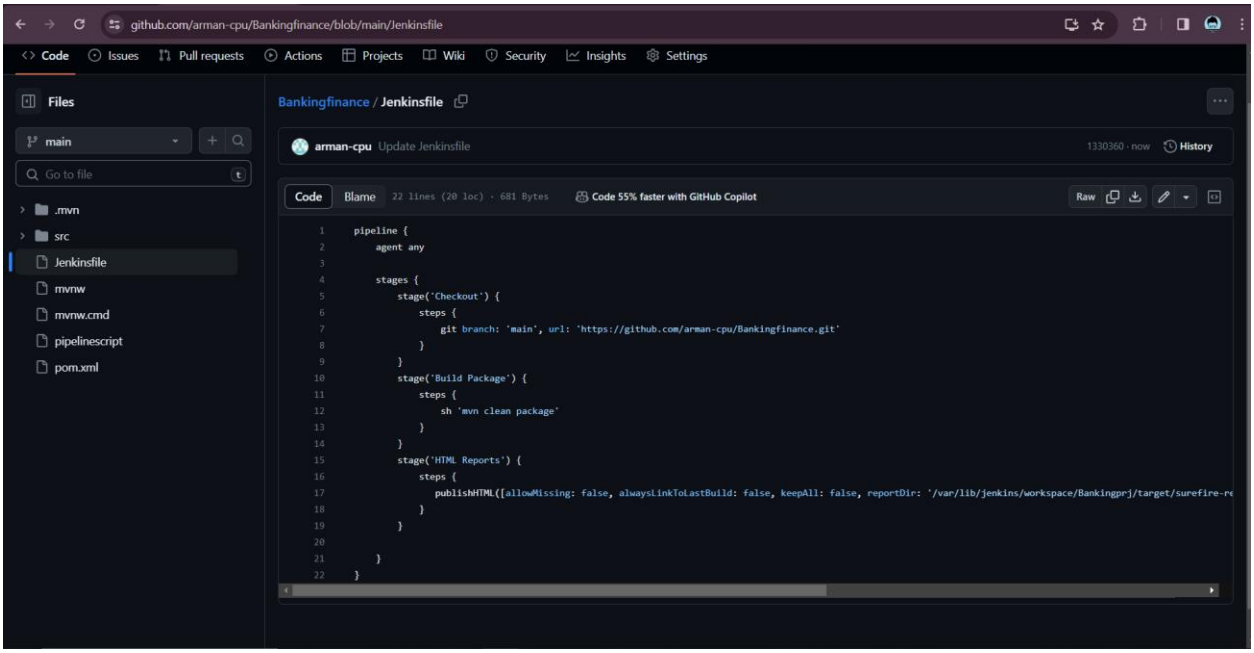
- Creating a pipeline job Bankingprj for our project.



- Verifying the console output of the pipeline job we created.

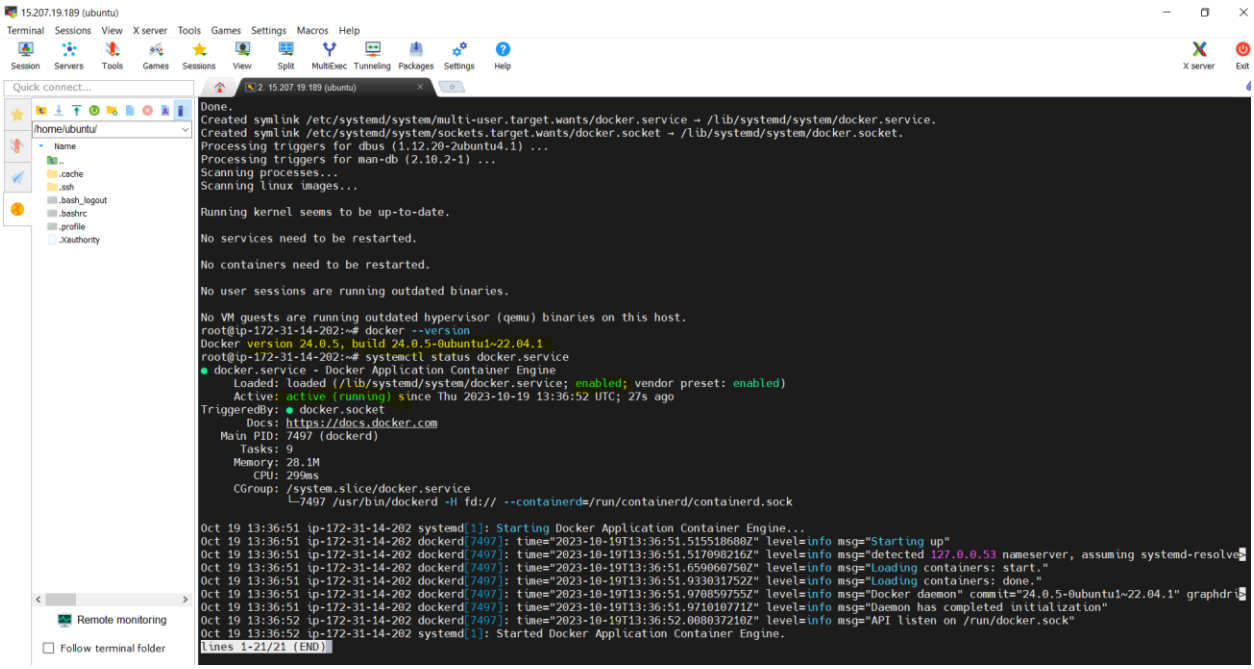


- Pipeline script that we wrote for our job Bankingprj.

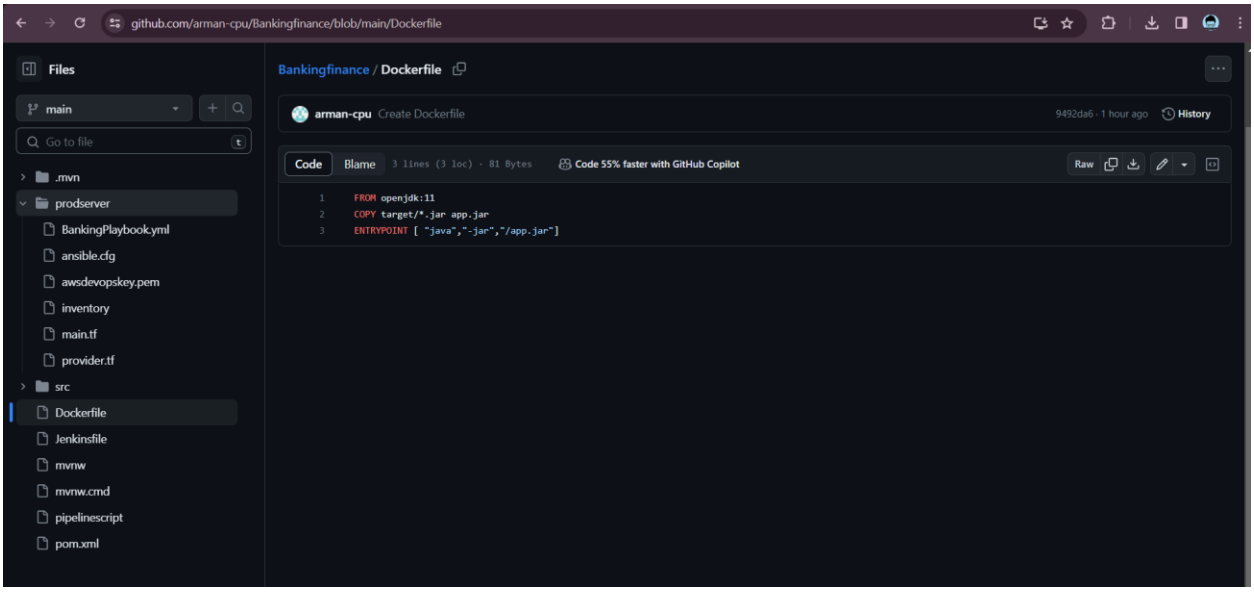


armanbaig89@gmail.com

- Installing docker in our instance and verifying its version and status.



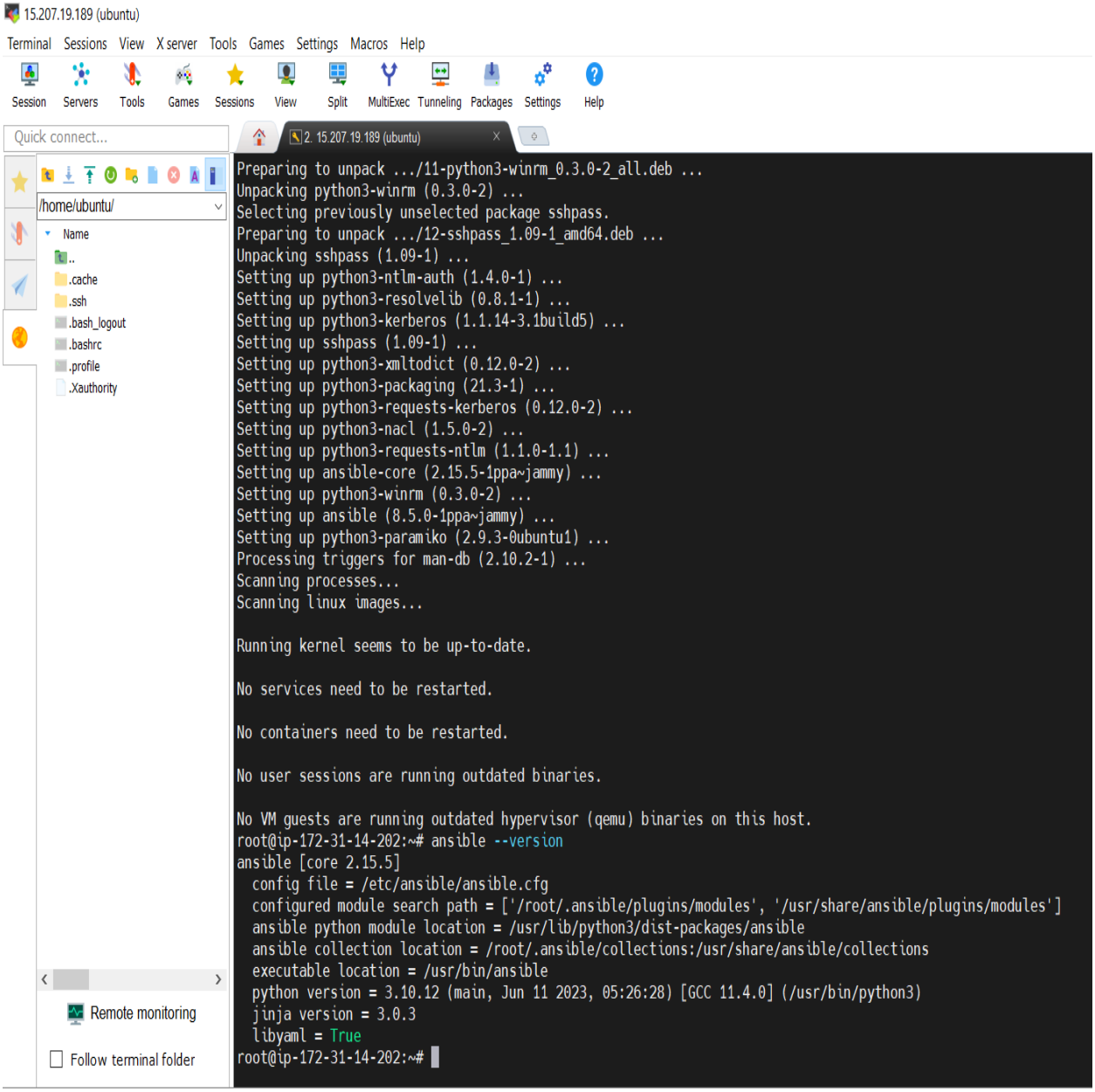
- Creating a docker file for our project .



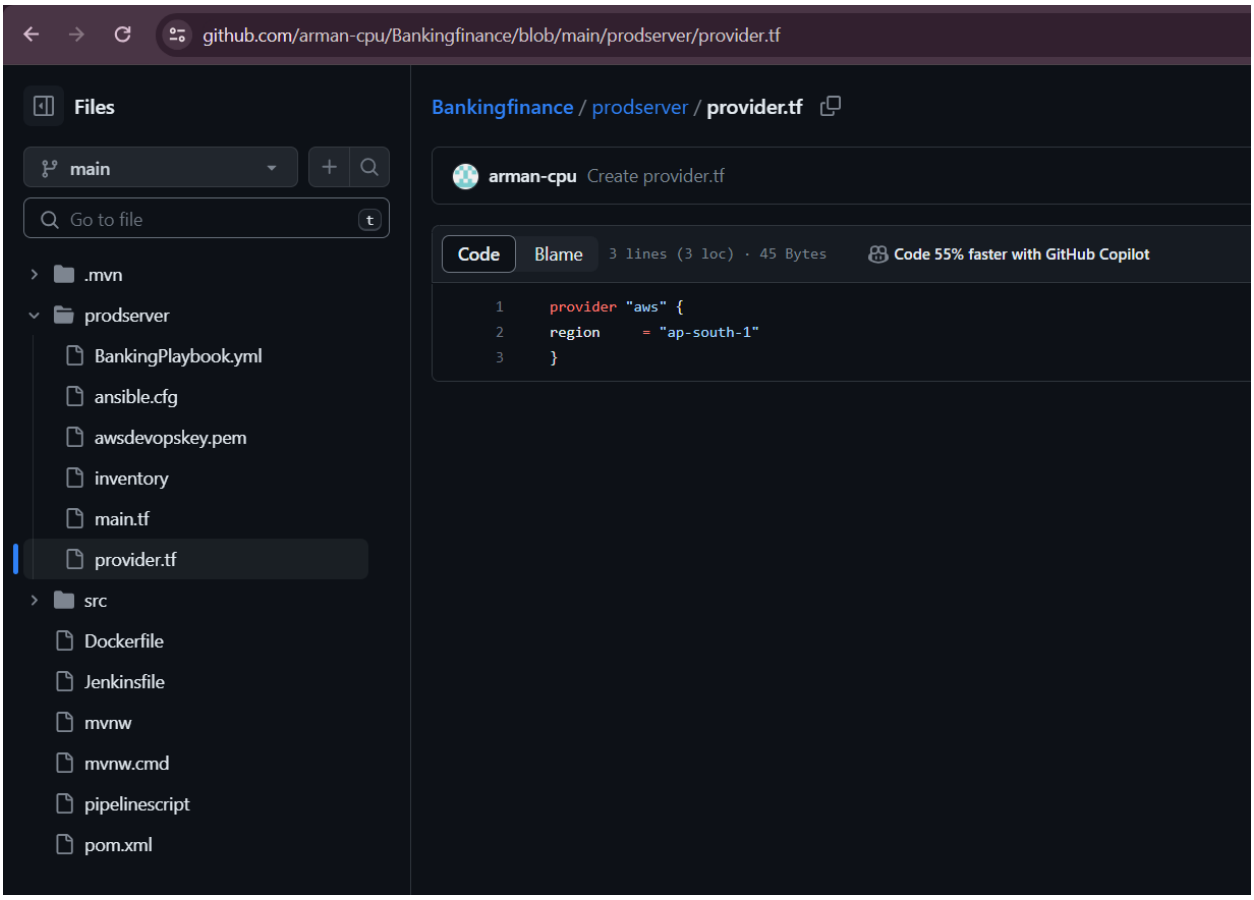
Installing AWS CLI and terraform to our ec2 instance

```
Get:6 https://apt.releases.hashicorp.com jammy InRelease [12.9 kB]
Hit:7 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:9 https://apt.releases.hashicorp.com jammy/main amd64 Packages [101 kB]
Fetched 114 kB in 1s (182 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
30 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@ip-172-31-14-202:~# sudo apt-get install terraform -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  terraform
0 upgraded, 1 newly installed, 0 to remove and 30 not upgraded.
Need to get 25.6 MB of archives.
After this operation, 80.7 MB of additional disk space will be used.
Get:1 https://apt.releases.hashicorp.com jammy/main amd64 terraform amd64 1.6.2-1 [25.6 MB]
Fetched 25.6 MB in 0s (68.3 MB/s)
Selecting previously unselected package terraform.
(Reading database ... 79814 files and directories currently installed.)
Preparing to unpack .../terraform_1.6.2-1_amd64.deb ...
Unpacking terraform (1.6.2-1) ...
Setting up terraform (1.6.2-1) ...
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-172-31-14-202:~# aws --version
aws-cli/1.22.34 Python/3.10.12 Linux/6.2.0-1012-aws botocore/1.23.34
root@ip-172-31-14-202:~# terraform --version
Terraform v1.6.2
on linux_amd64
root@ip-172-31-14-202:~#
```

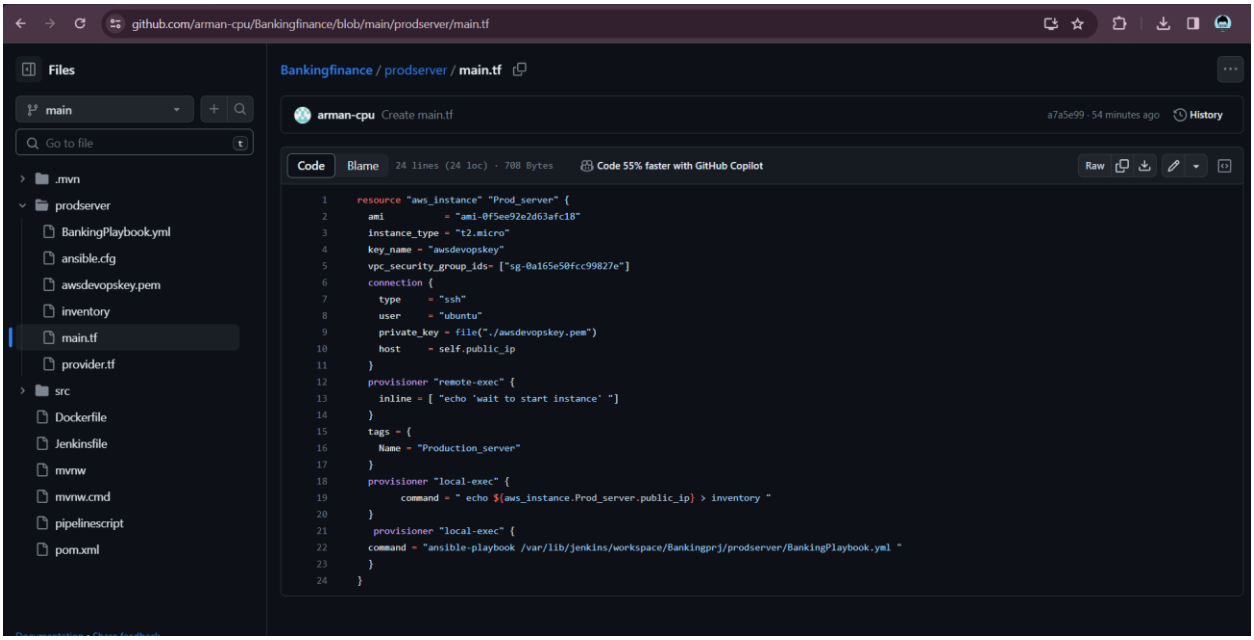
- Installing Ansible to our Ec2 instance and verifying its version & status.



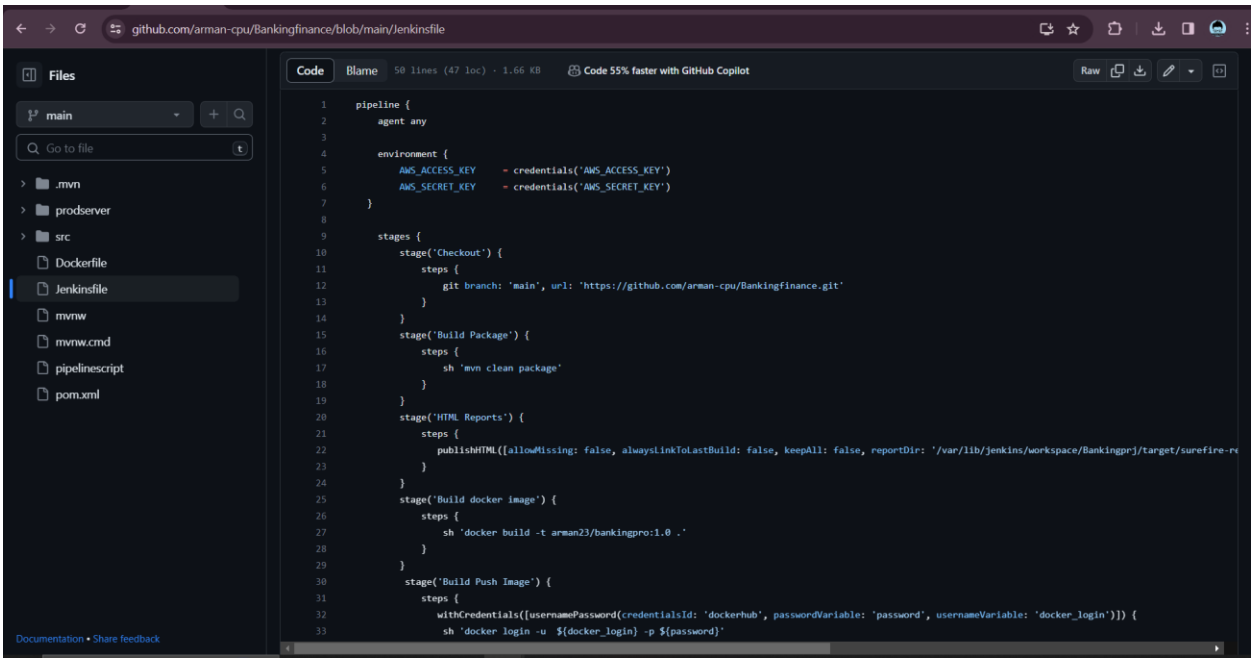
- Creating a provider.tf file to recognize that our provider is AWS.

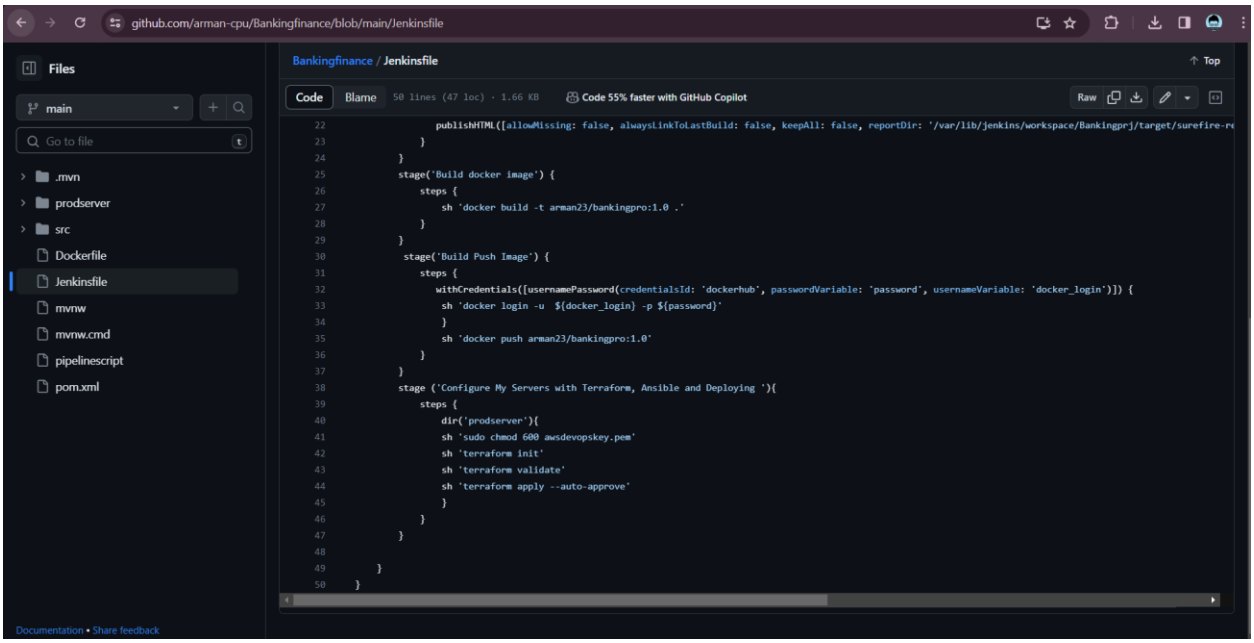


- Writing main.tf file to create another instance to deploy our source code.

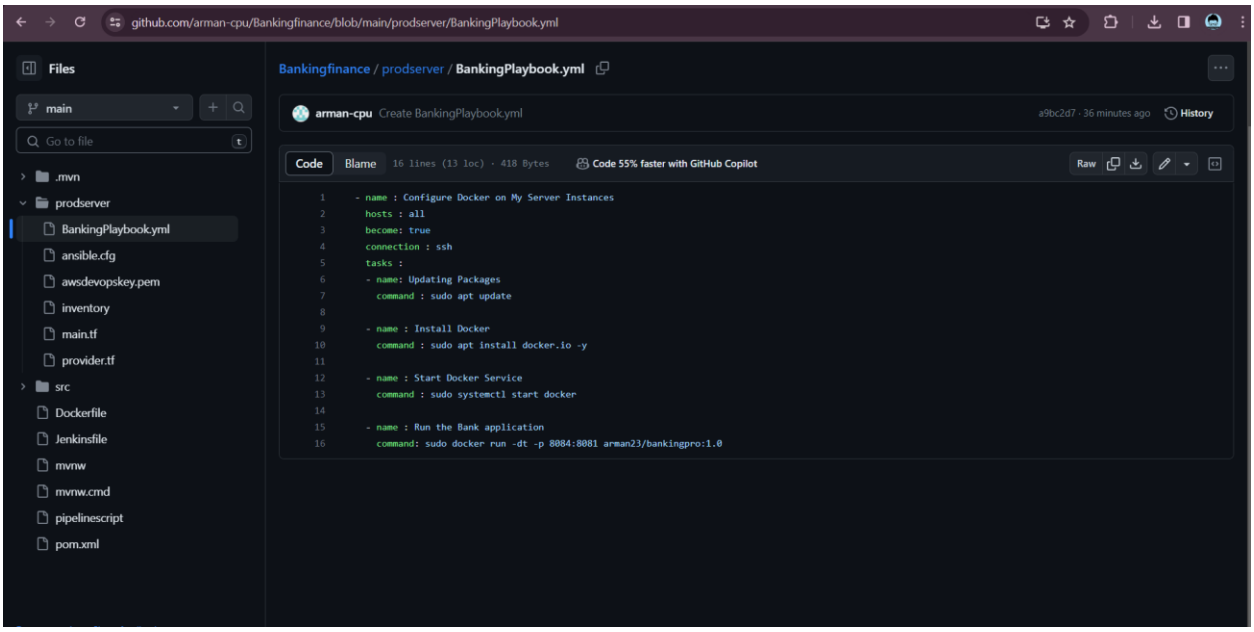


- Writing pipeline script for our project to execute instructions of CICD.

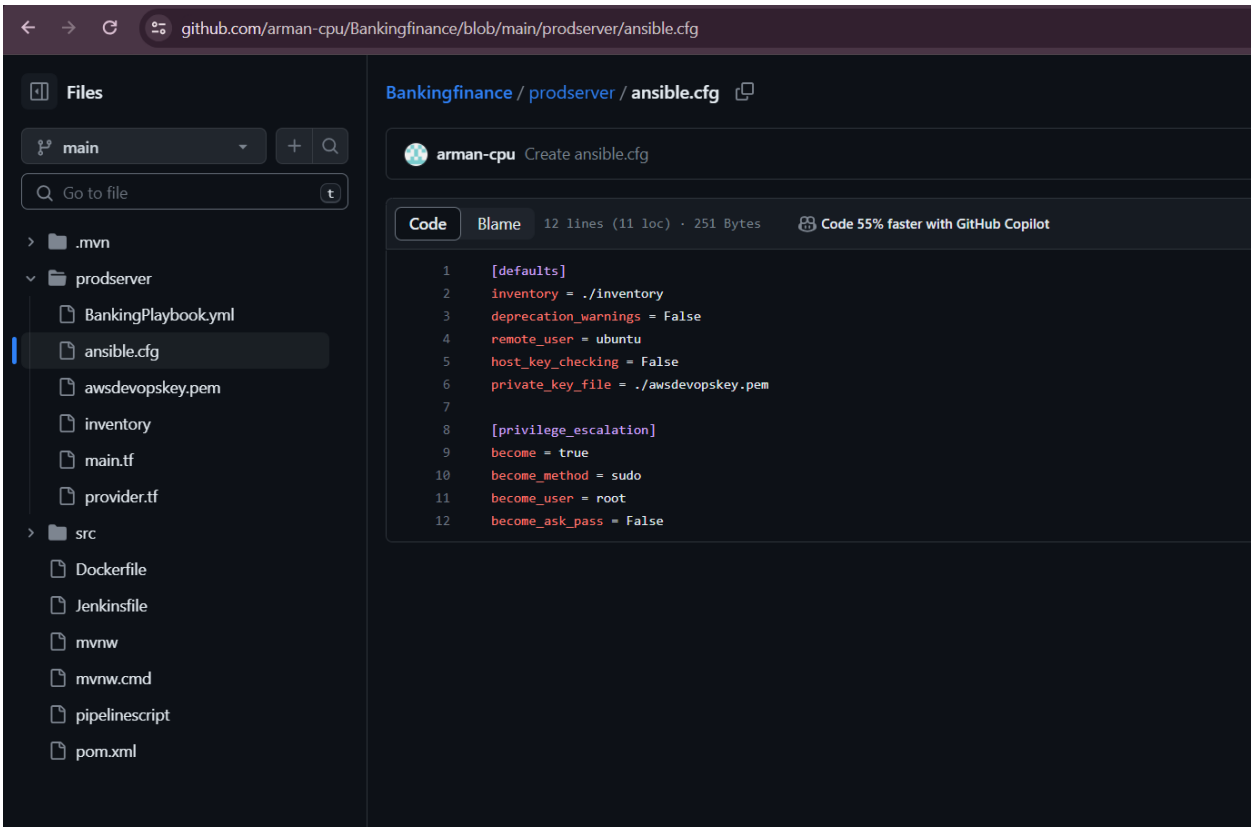




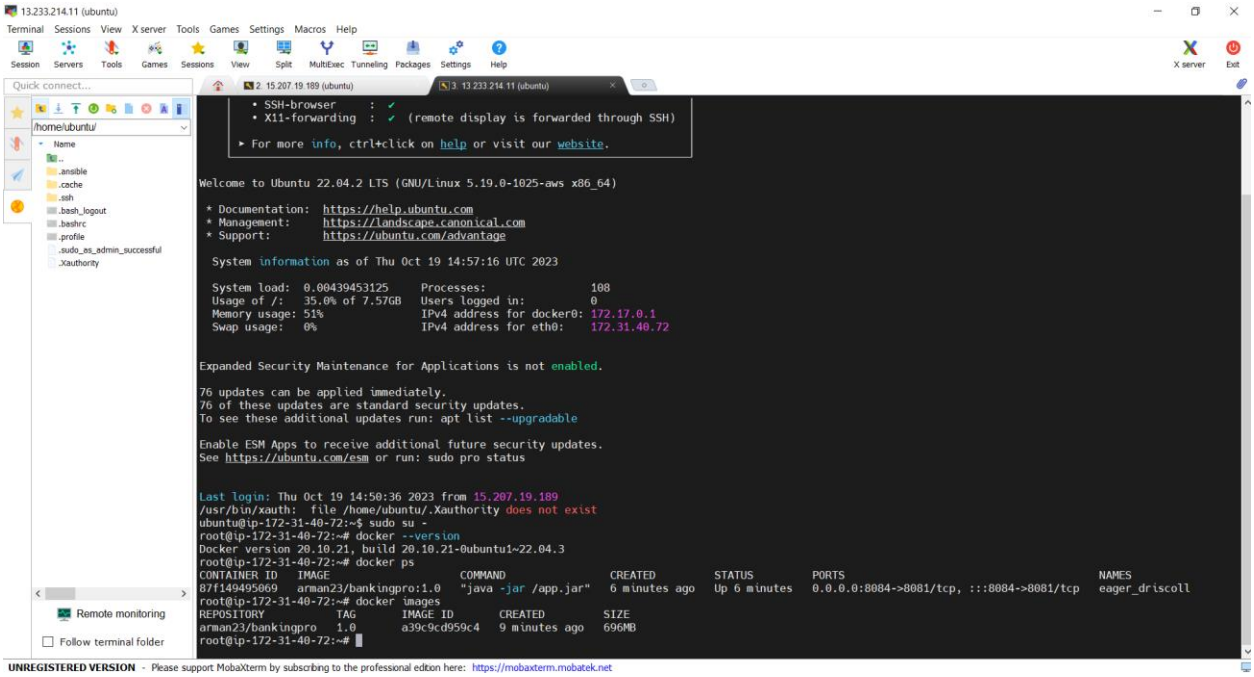
- Writing playbook for our project to perform CD.



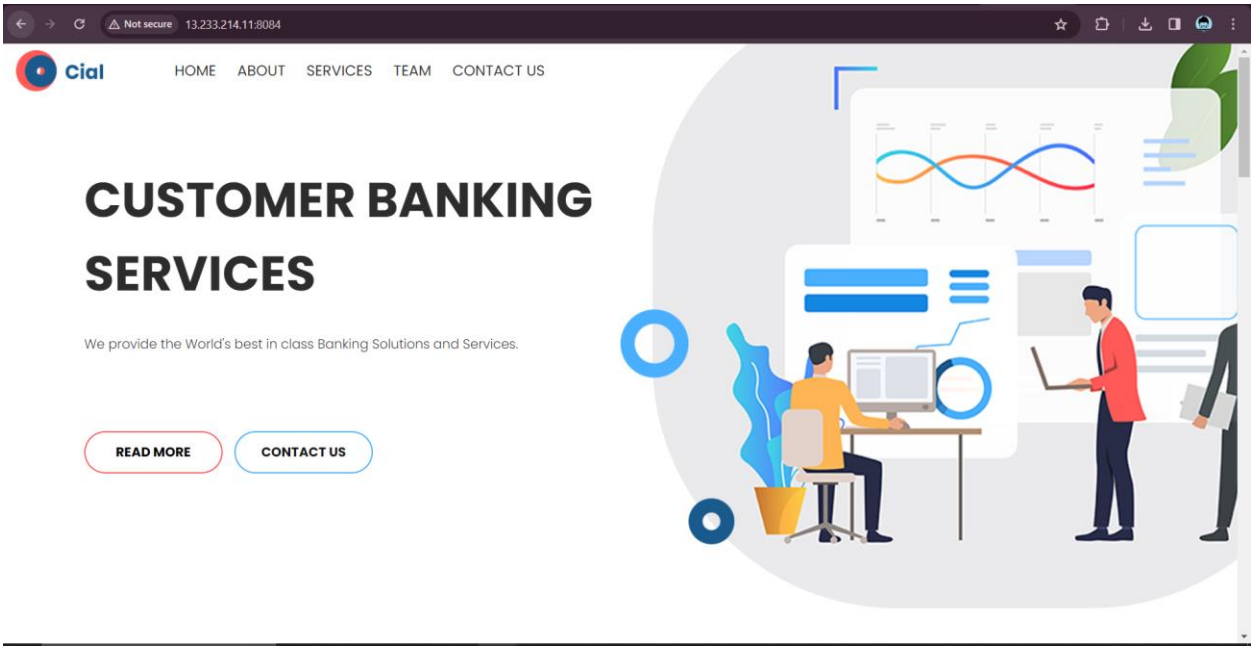
- Creating a configuration file for ansible.



- After running the job verifying that docker is installed and has pulled the image .



- Verifying that our code is deployed and application is up and runinng



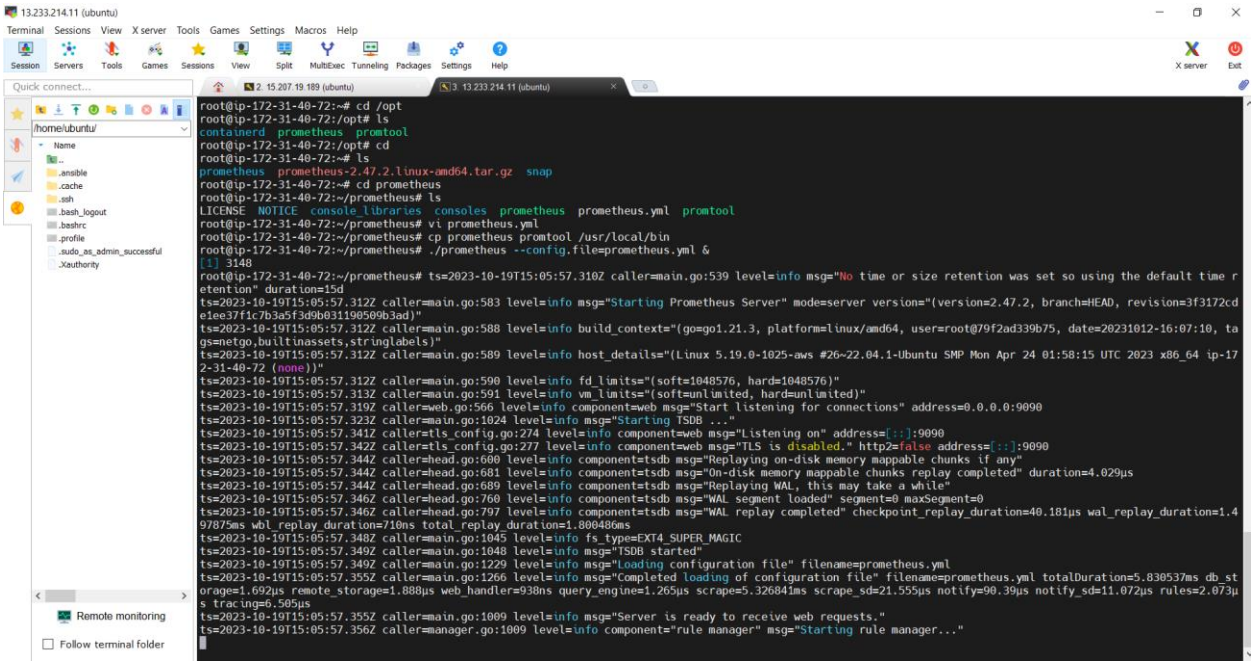
- Now installing prometheus to our production server to monitor the jobs.

```
13.233.214.11 (ubuntu)
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
Quick connect...
2. 15.207.19.189 (ubuntu)   3. 13.233.214.11 (ubuntu)
/home/ubuntu/
Name
..
.ansible
.cache
.ssh
.bash_logout
.bashrc
.profile
.sudo_as_admin_successful
.Xauthority

Get:32 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [27.8 kB]
Get:33 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [16.4 kB]
Get:34 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [644 B]
Get:35 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:36 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [888 kB]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [179 kB]
Get:39 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [1007 kB]
Get:40 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [163 kB]
Get:41 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [792 kB]
Get:42 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [145 kB]
Fetched 30.2 MB in 12s (2468 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
138 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@ip-172-31-40-72:~# wget https://github.com/prometheus/prometheus/releases/download/v2.47.2/prometheus-2.47.2.linux-amd64.tar.gz
--2023-10-19 15:00:43--  https://github.com/prometheus/prometheus/releases/download/v2.47.2/prometheus-2.47.2.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/6838921/e1cbb1e2-8bcf-457e-bea5-5382de8d82a6?X-Amz-Algorithm=AWS4-HMAC-S
HA256&X-Amz-Credential=AKIAIWNJYAX4CSVEH53A%2F20231019%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20231019T150043Z&X-Amz-Expires=300&X-Amz-Signature=6bbab6a16d
7a2753a564c2dd03795df34318e3eea69720cae41bf3cb7addc3826&X-Amz-SignedHeaders=host&actor_id=0&key_id=0&repo_id=6838921&response-content-disposition=attachment%3B%
20filename%3Dprometheus-2.47.2.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream [following]
--2023-10-19 15:00:44--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/e1cbb1e2-8bcf-457e-bea5-5382de8d82a6?X-Amz-Algori
thm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWNJYAX4CSVEH53A%2F20231019%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20231019T150043Z&X-Amz-Expires=300&X-Amz-Signa
ture=6bbab6a16d7a2753a564c2dd03795df34318e3eea69720cae41bf3cb7addc3826&X-Amz-SignedHeaders=host&actor_id=0&key_id=0&repo_id=6838921&response-content-disposition
=attachment%3B%20filename%3Dprometheus-2.47.2.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.109.133, 185.199.110.133, 185.199.111.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.109.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 95708924 (91M) [application/octet-stream]
Saving to: 'prometheus-2.47.2.linux-amd64.tar.gz'

prometheus-2.47.2.linux-amd64.tar.gz    100%[===================================================================>]  91.27M   132MB/s    in 0.7s

2023-10-19 15:00:45 (132 MB/s) - 'prometheus-2.47.2.linux-amd64.tar.gz' saved [95708924/95708924]

root@ip-172-31-40-72:~# ls
prometheus-2.47.2.linux-amd64.tar.gz  snap
root@ip-172-31-40-72:~# tar -xvzf prometheus-2.47.2.linux-amd64.tar.gz
Remote monitoring
Follow terminal folder
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net
```

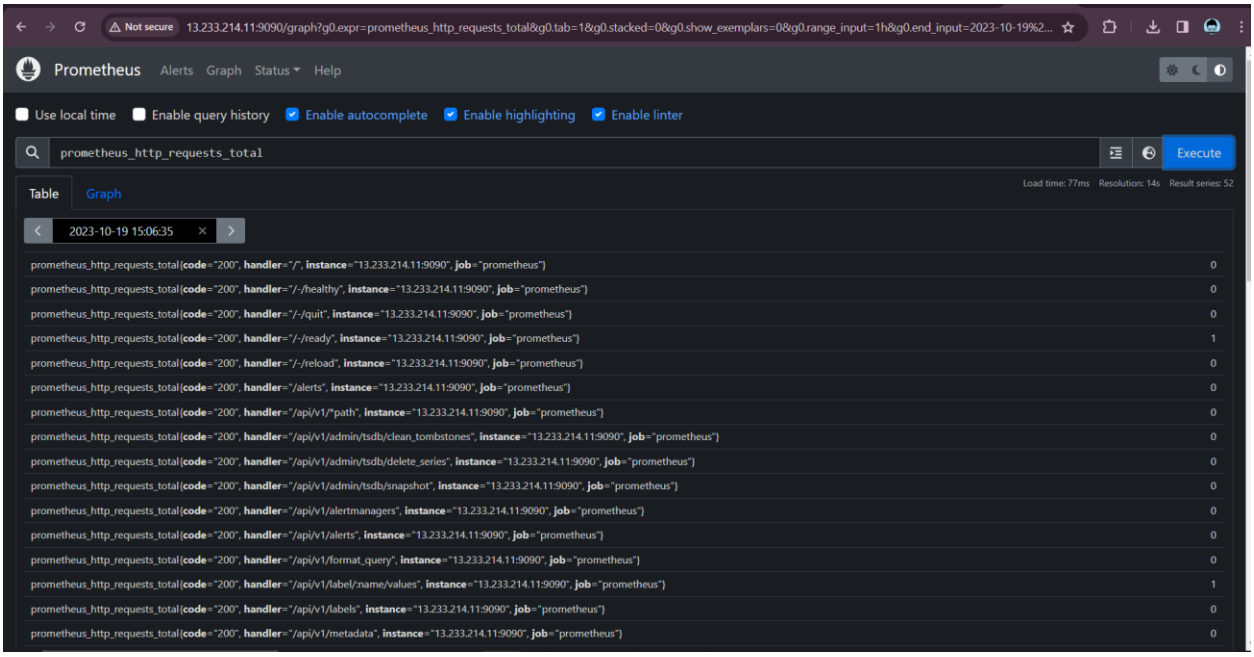
- Verifying our Prometheus metrics is running on port 8080.

```
Not secure  15.207.19.189:8080/prometheus/
vm_memory_pools_G1_Eden_Space_committed_window_1h{quantile="0.99",} 6.37534208E8
vm_memory_pools_G1_Eden_Space_committed_window_1h{quantile="0.999",} 6.37534208E8
vm_memory_pools_G1_Eden_Space_committed_window_1h_count 5.0
# HELP http_responseCodes_forbidden_total Generated from Dropwizard metric import (metric=http.responseCodes.forbidden, type=com.codahale.metrics.Meter)
# TYPE http_responseCodes_forbidden_total counter
http_responseCodes_forbidden_total 0.0
# HELP jvm_memory_pool_allocated_bytes_total Total bytes allocated in a given JVM memory pool. Only updated after GC, not continuously.
# TYPE jvm_memory_pool_allocated_bytes_total counter
jvm_memory_pool_allocated_bytes_total{pool="CodeHeap 'profiled nmethods'",} 1.9882624E7
jvm_memory_pool_allocated_bytes_total{pool="G1 Old Gen",} 7.4124289024E10
jvm_memory_pool_allocated_bytes_total{pool="G1 Eden Space",} 1.241513984E9
jvm_memory_pool_allocated_bytes_total{pool="CodeHeap 'non-profiled nmethods'",} 4462464.0
jvm_memory_pool_allocated_bytes_total{pool="G1 Survivor Space",} 3.14572BE7
jvm_memory_pool_allocated_bytes_total{pool="Compressed Class Space",} 9768440.0
jvm_memory_pool_allocated_bytes_total{pool="Metaspace",} 7.8010672E7
jvm_memory_pool_allocated_bytes_total{pool="CodeHeap 'non-nmethods'",} 2467584.0
# HELP default_jenkins_builds_duration_milliseconds_summary_created Summary of Jenkins build times in milliseconds by Job
# TYPE default_jenkins_builds_duration_milliseconds_summary_created gauge
default_jenkins_builds_duration_milliseconds_summary_created{jenkins_job="testproject/com.project.staragile:banking",repo="NA",buildable="true",} 1.697728290404E9
default_jenkins_builds_duration_milliseconds_summary_created{jenkins_job="testproject",repo="NA",buildable="true",} 1.697728290399E9
default_jenkins_builds_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",} 1.697728290397E9
# HELP default_jenkins_builds_failed_build_count_created Failed build count
# TYPE default_jenkins_builds_failed_build_count_created gauge
default_jenkins_builds_failed_build_count_created{jenkins_job="Bankingprj",repo="NA",buildable="true",} 1.697728290398E9
# HELP default_jenkins_builds_last_stage_duration_milliseconds_summary_created Summary of Jenkins build times by Job and Stage in the last build
# TYPE default_jenkins_builds_last_stage_duration_milliseconds_summary_created gauge
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="Build Push Image",} 1.697728290395E9
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="Checkout",} 1.697728290395E9
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="Configure My Servers with Terraform, Ansible and Deploying ",} 1.697728290395E9
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="HTML Reports",} 1.697728290395E9
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="Build Package",} 1.697728290395E9
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="Build docker image",} 1.697728290395E9
default_jenkins_builds_last_stage_duration_milliseconds_summary_created{jenkins_job="Bankingprj",repo="NA",buildable="true",stage="Declarative: Checkout SCM",} 1.697728290395E9
# HELP default_jenkins_builds_success_build_count_created Successful build count
# TYPE default_jenkins_builds_success_build_count_created gauge
default_jenkins_builds_success_build_count_created{jenkins_job="testproject/com.project.staragile:banking",repo="NA",buildable="true",} 1.697728290404E9
default_jenkins_builds_success_build_count_created{jenkins_job="testproject",repo="NA",buildable="true",} 1.697728290399E9
default_jenkins_builds_success_build_count_created{jenkins_job="Bankingprj",repo="NA",buildable="true",} 1.697728290397E9
# HELP jvm_memory_pool_allocated_bytes_created Total bytes allocated in a given JVM memory pool. Only updated after GC, not continuously.
# TYPE jvm_memory_pool_allocated_bytes_created gauge
jvm_memory_pool_allocated_bytes_created{pool="CodeHeap 'profiled nmethods'",} 1.697728218521E9
jvm_memory_pool_allocated_bytes_created{pool="G1 Old Gen",} 1.697728218534E9
jvm_memory_pool_allocated_bytes_created{pool="G1 Eden Space",} 1.697728218534E9
jvm_memory_pool_allocated_bytes_created{pool="CodeHeap 'non-profiled nmethods'",} 1.697728218534E9
jvm_memory_pool_allocated_bytes_created{pool="G1 Survivor Space",} 1.697728218534E9
jvm_memory_pool_allocated_bytes_created{pool="Compressed Class Space",} 1.697728218534E9
jvm_memory_pool_allocated_bytes_created{pool="Metaspace",} 1.697728218534E9
jvm_memory_pool_allocated_bytes_created{pool="CodeHeap 'non-nmethods'",} 1.697728218534E9
```

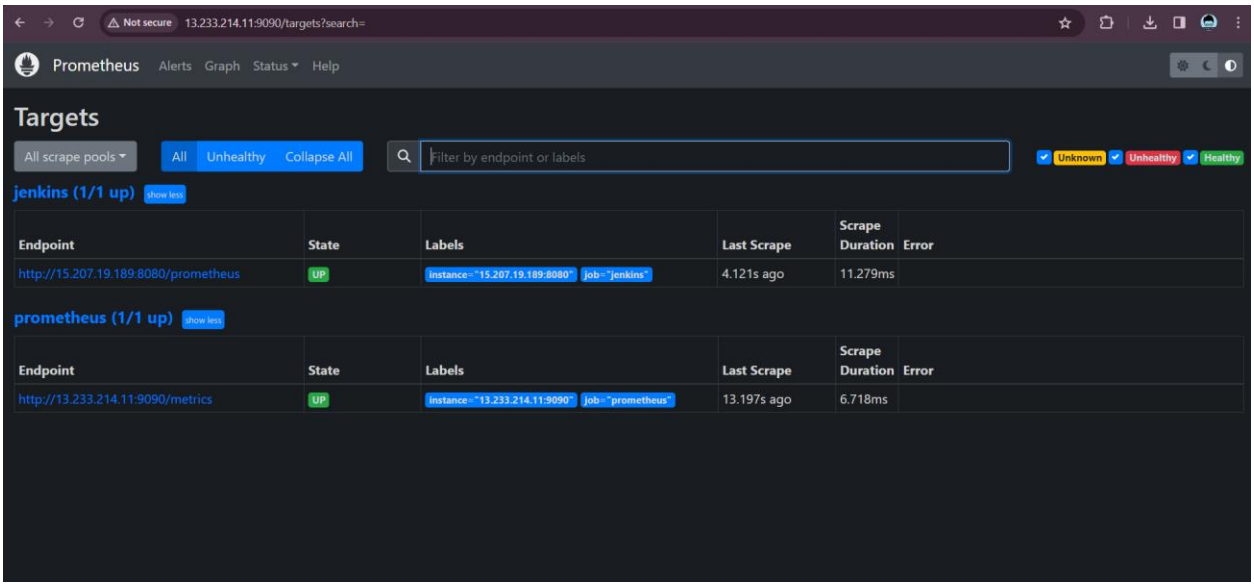
- Adding the Ip of jenkins server to prometheus.yml file and executing the prometheus



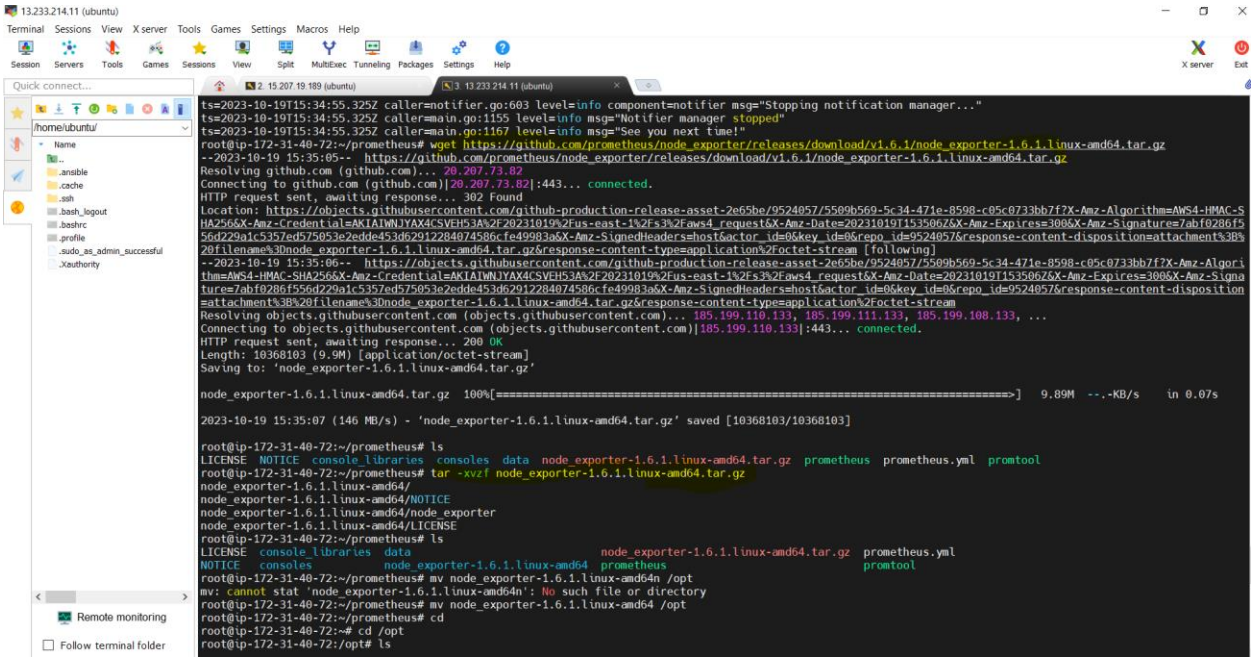
- Verifying our Prometheus working fine by executing some query.



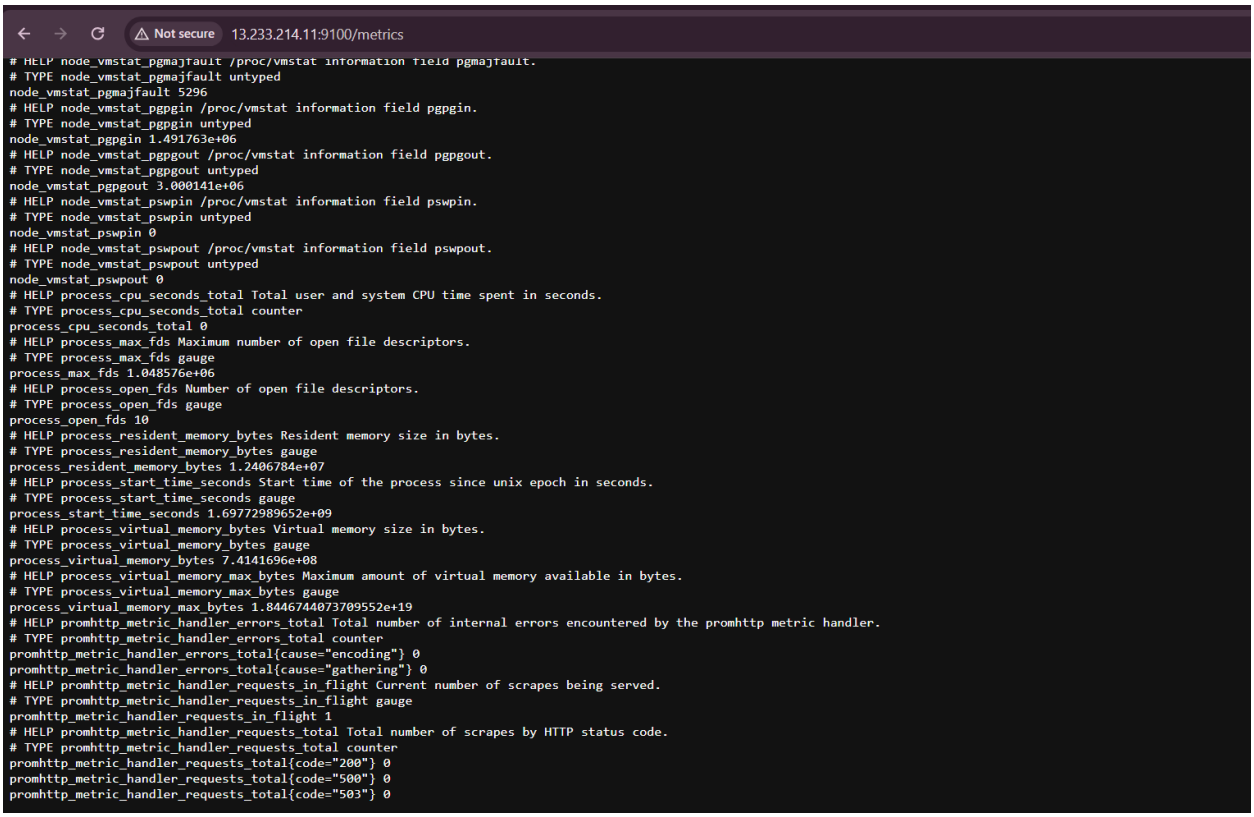
- Verifying the endpoints which we have added in Prometheus.yml file.



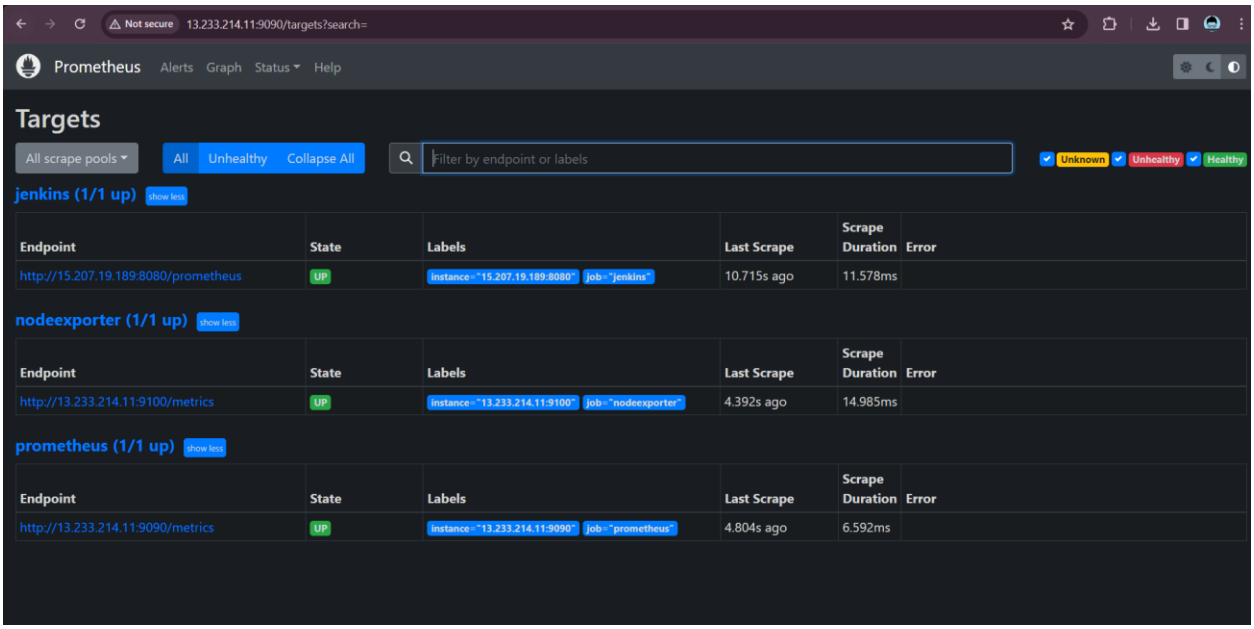
- Installing node exporter to our machine.



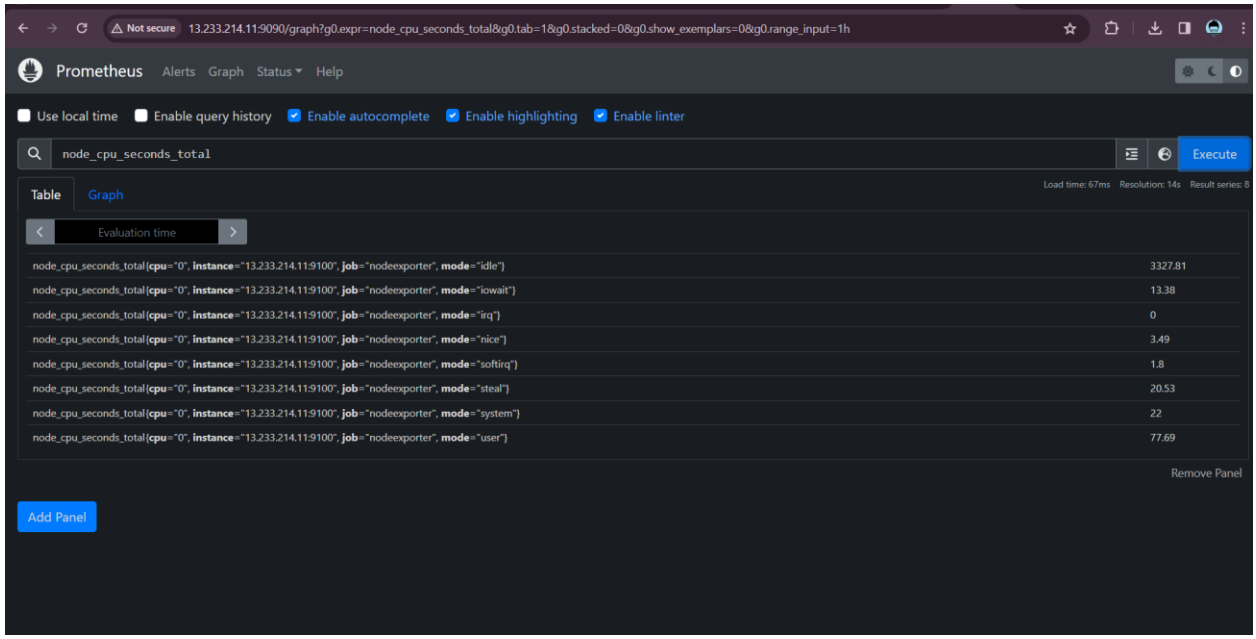
- Verifying the node exporter matric is up and running and adding endpoint in prometheus.yml.



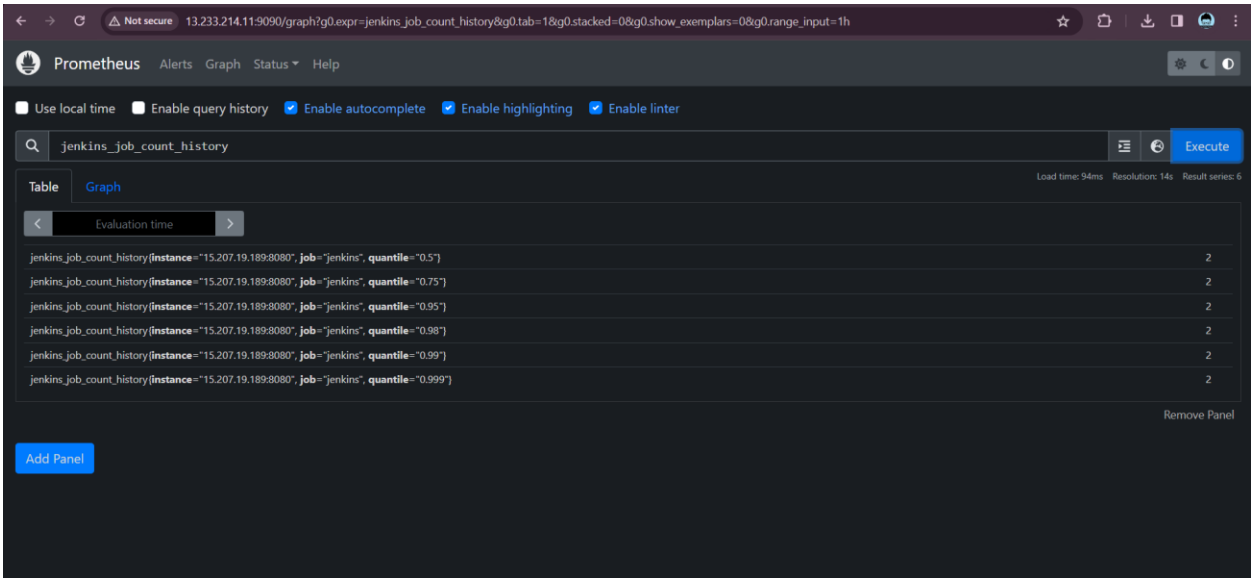
- Verifying all the endpoints are added or not .



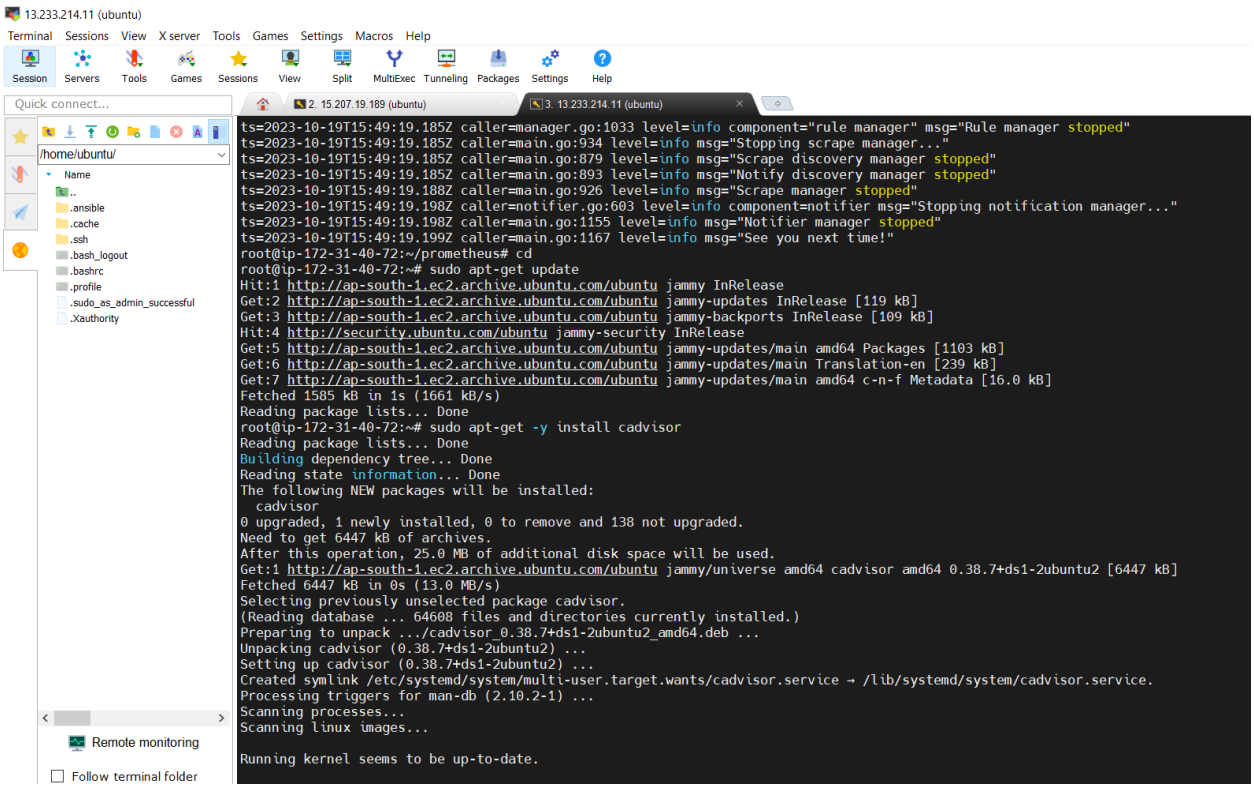
- Executing node cpu sec total in prometheus.



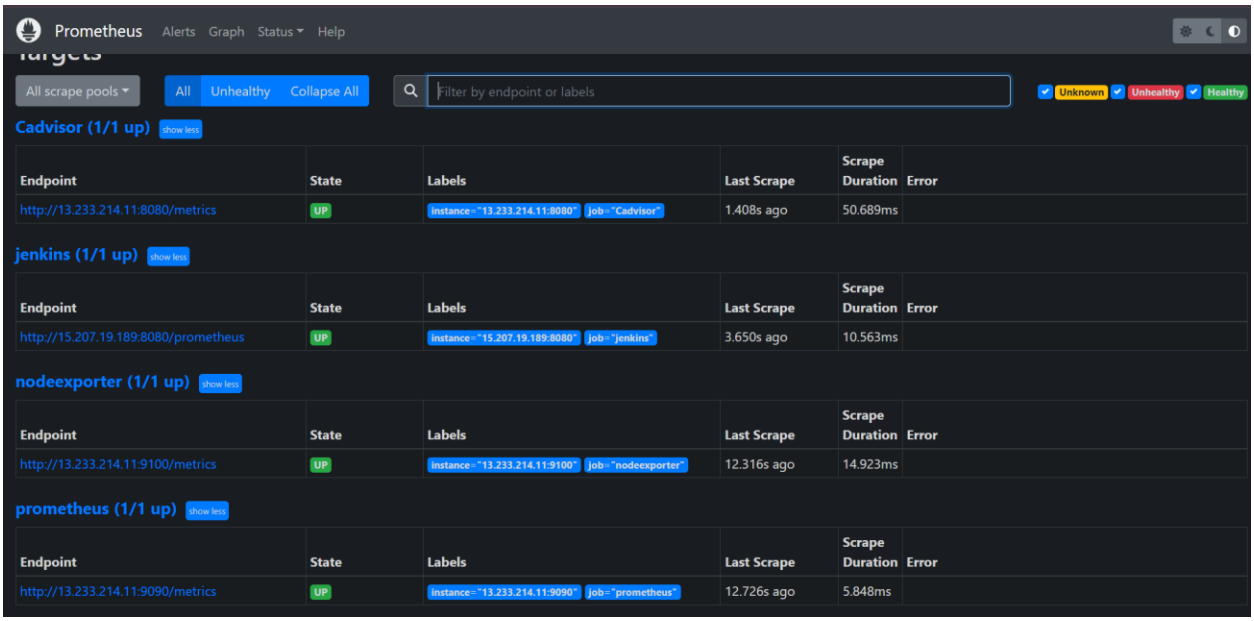
- Checking how many jobs do we have in Jenkins by running Jenkins job count history.



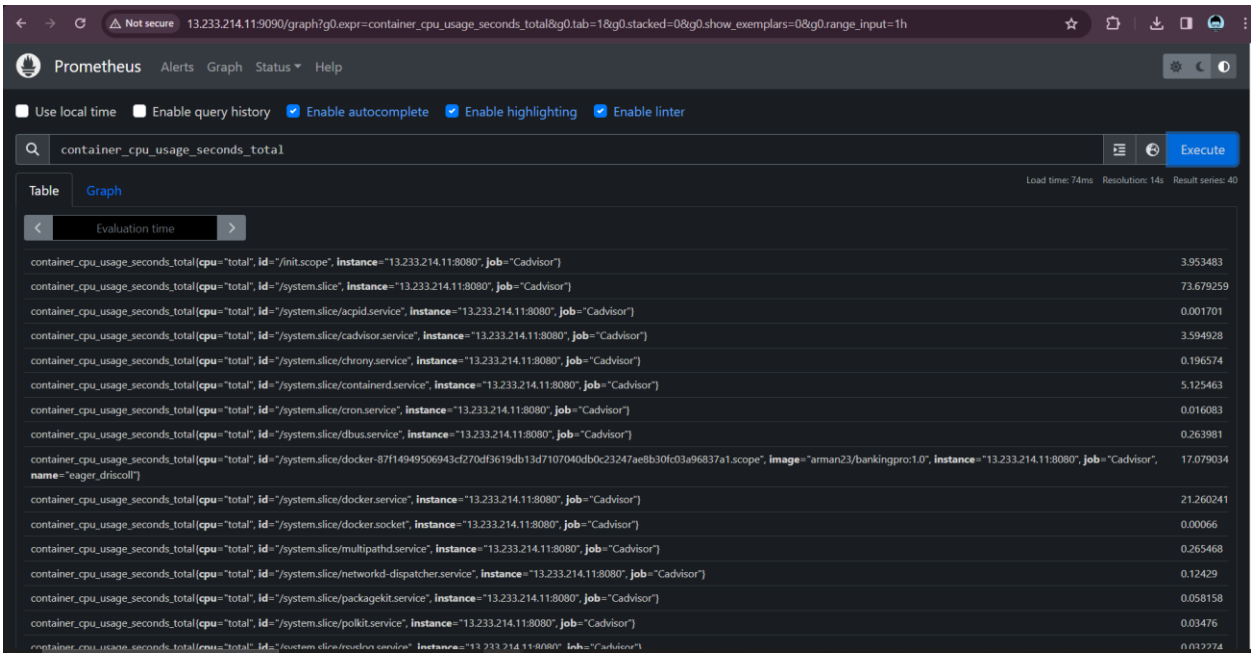
Installing Cadvisor to our machine .



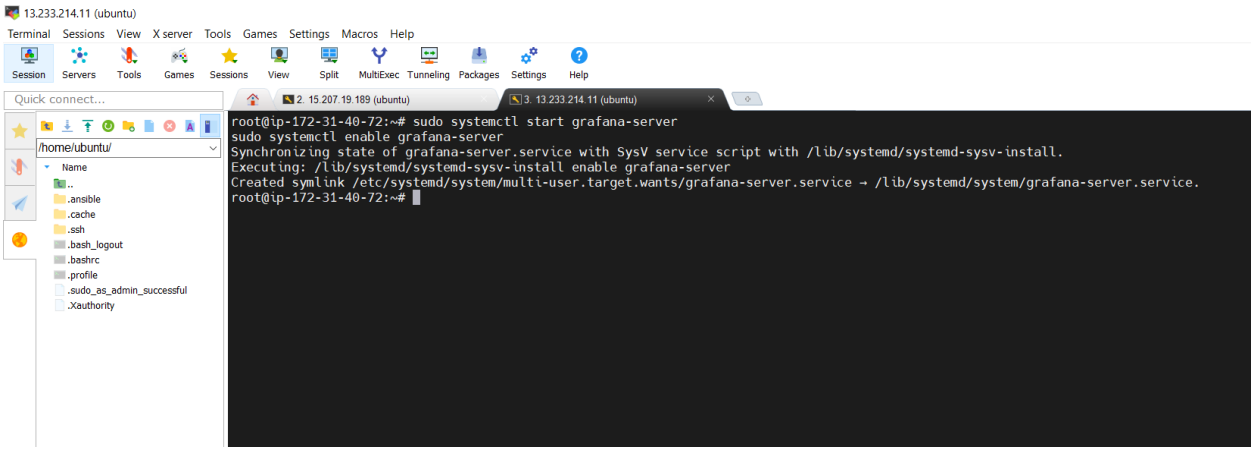
Verifying all the endpoints are setup.



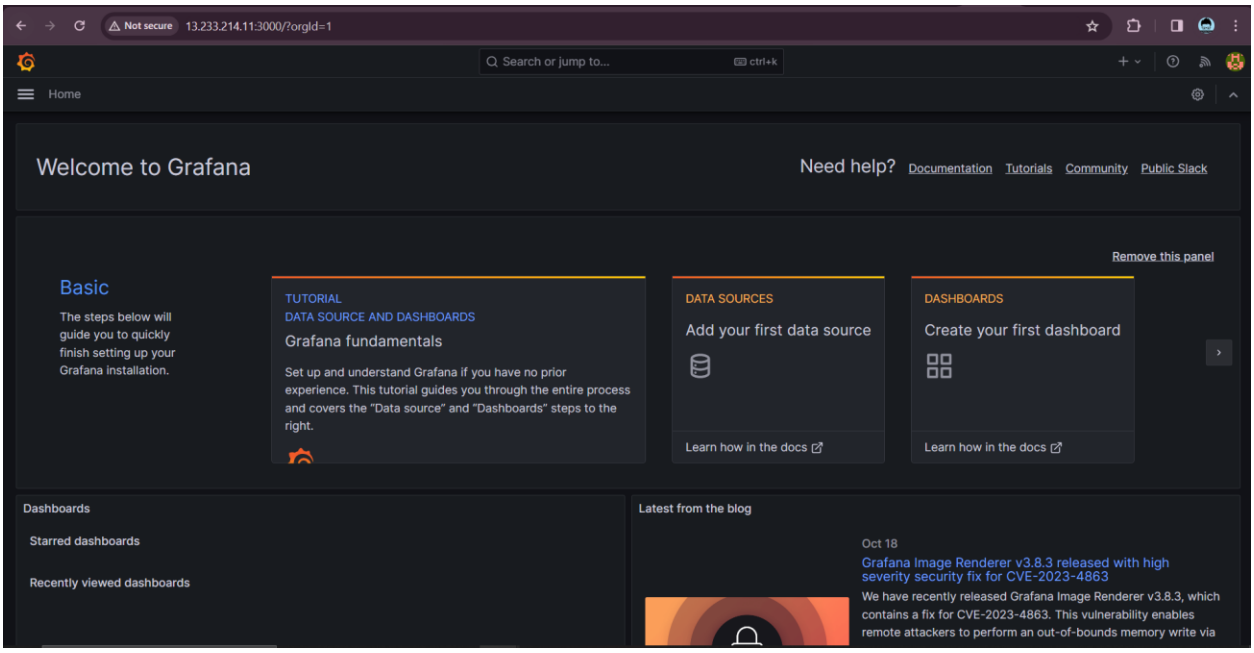
- Executing container cpu usage total in promethes and its output.



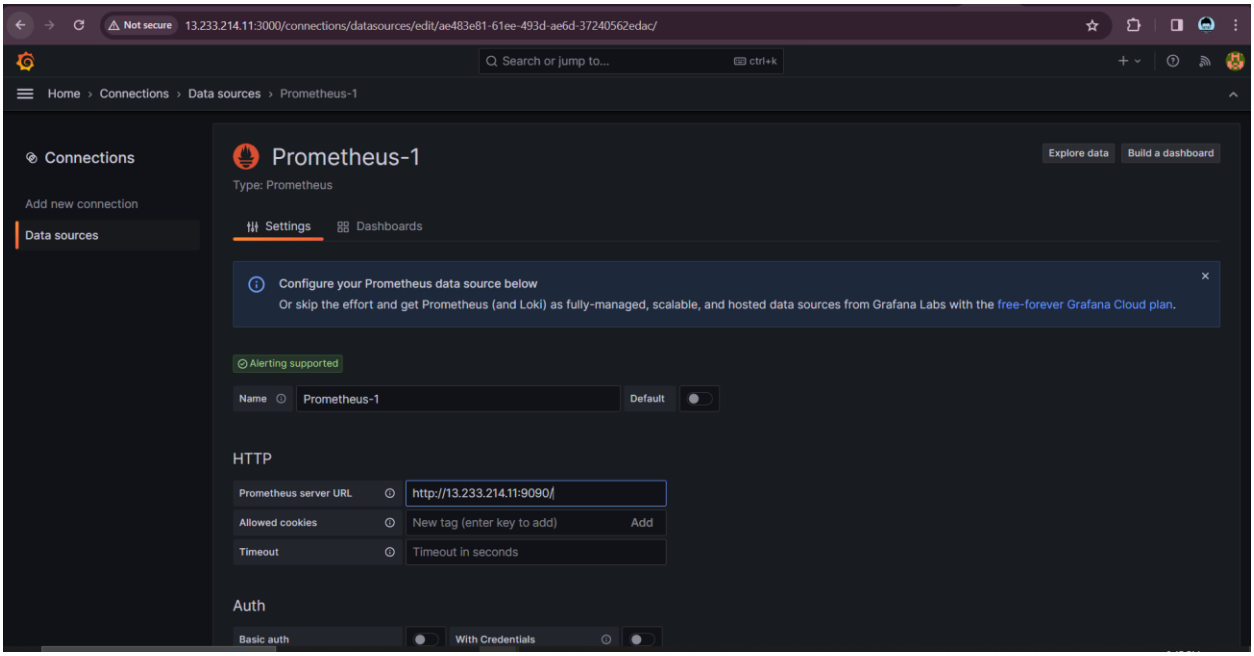
- Installing grafana to our production server for better interface.



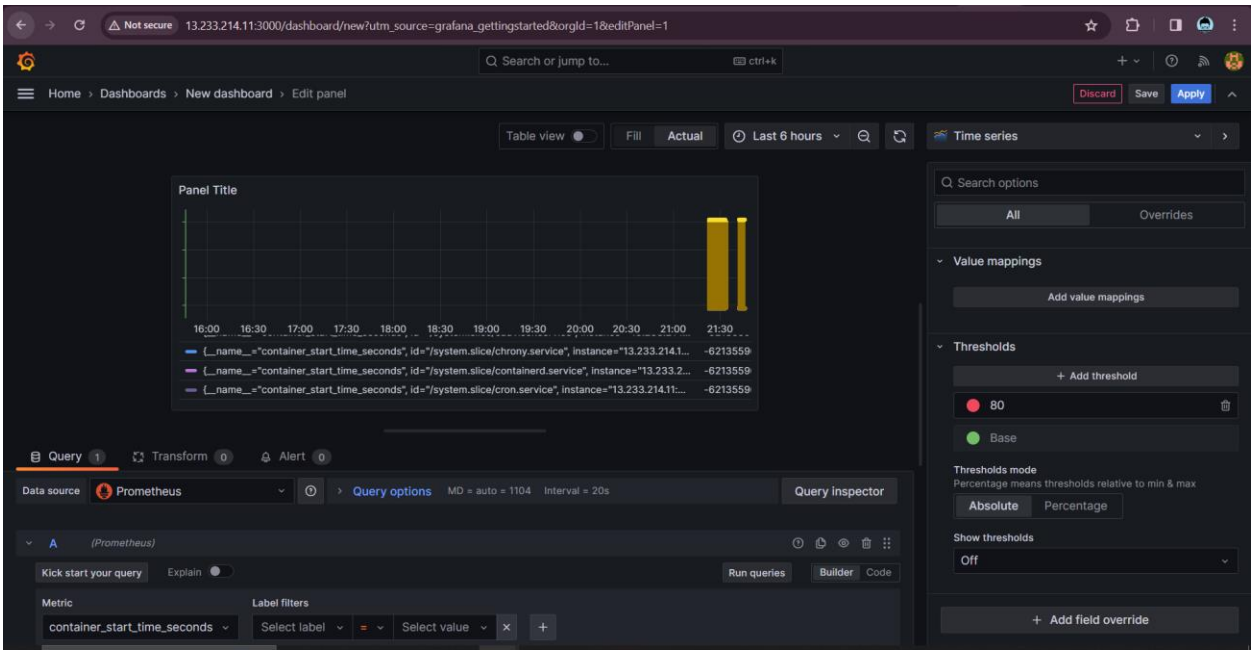
- Launching grafana on port 3000 will be monitor from grafana.



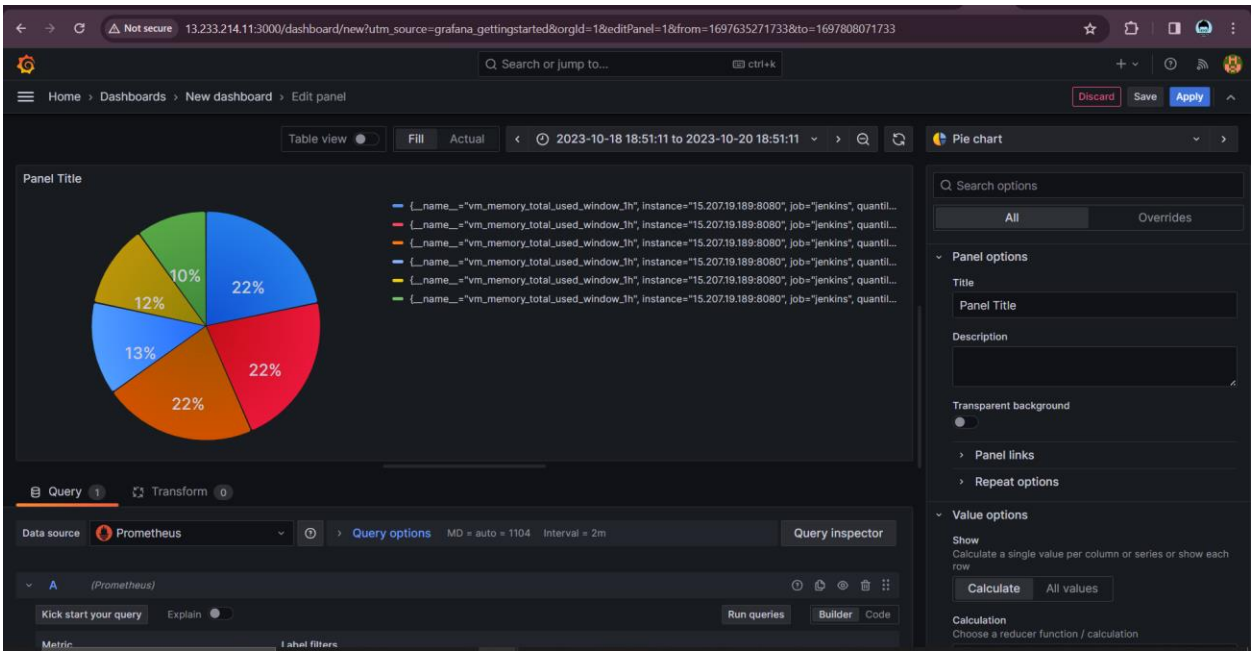
- Setting up Prometheus in Grafana by adding Prometheus URL .



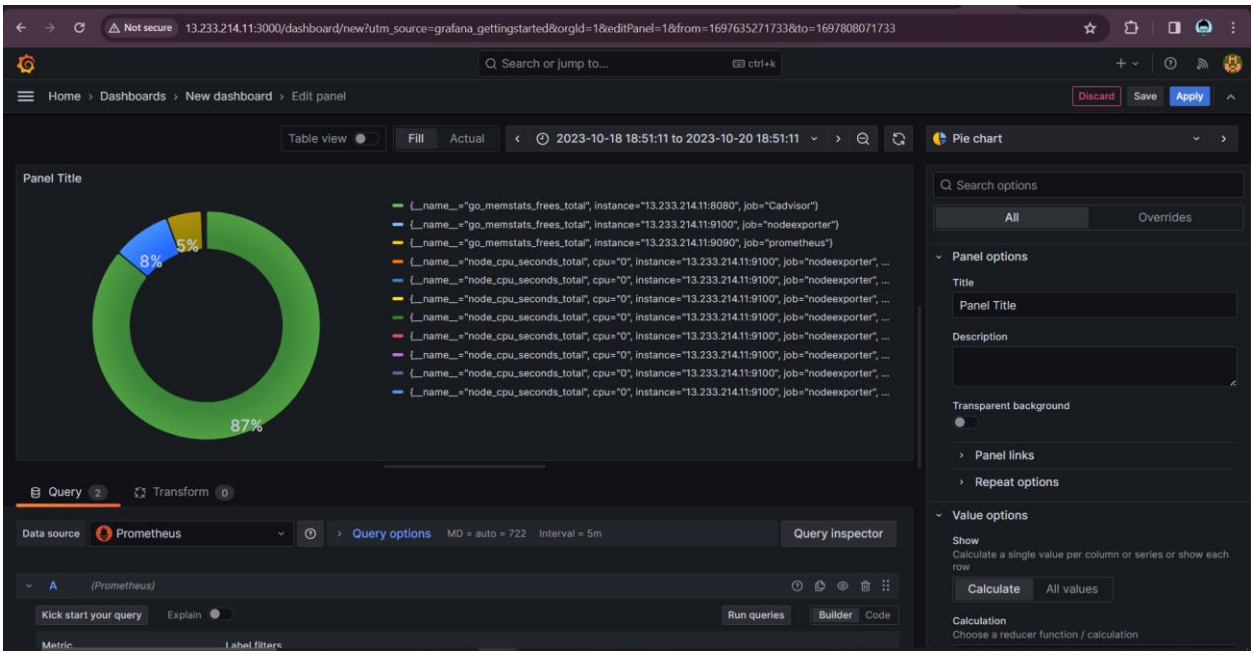
- Running the container start time seconds query.



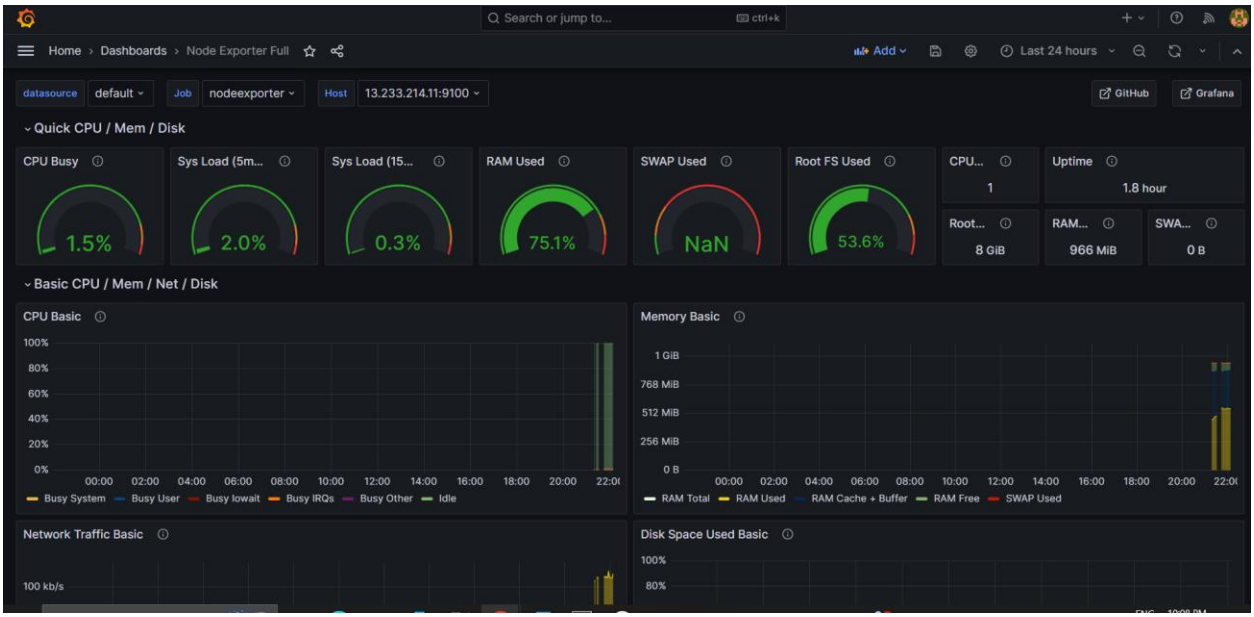
- Running the container start time seconds query as pie chart.



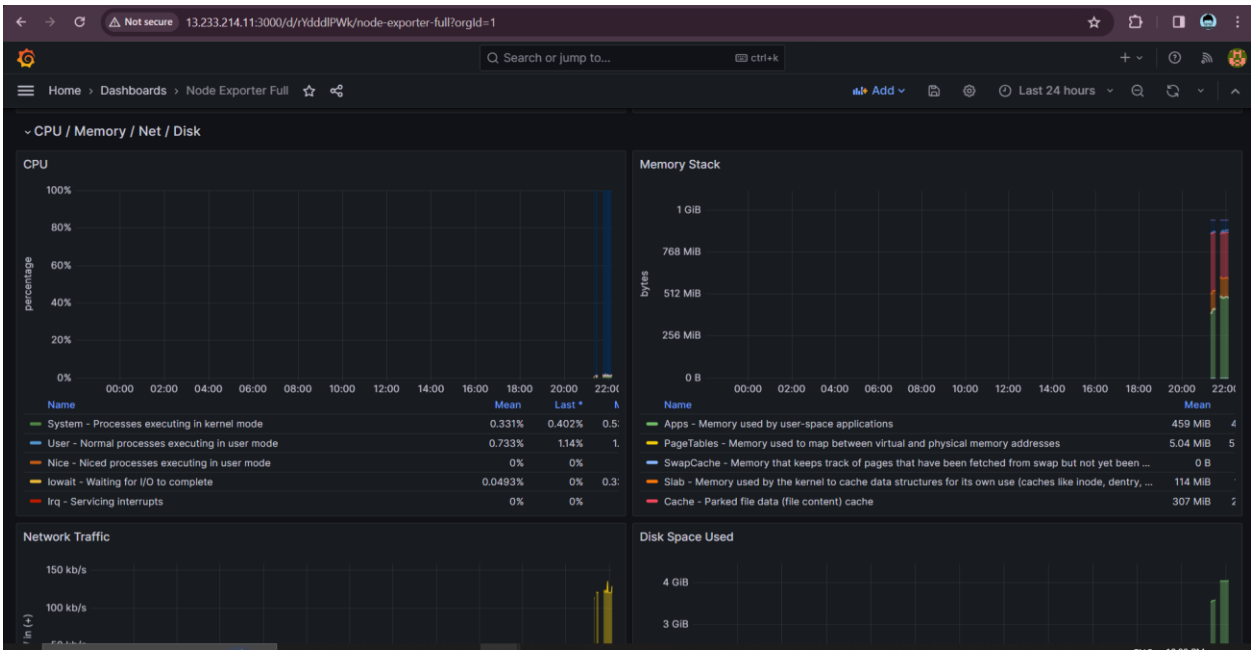
- Running the storage qurey for our production server.



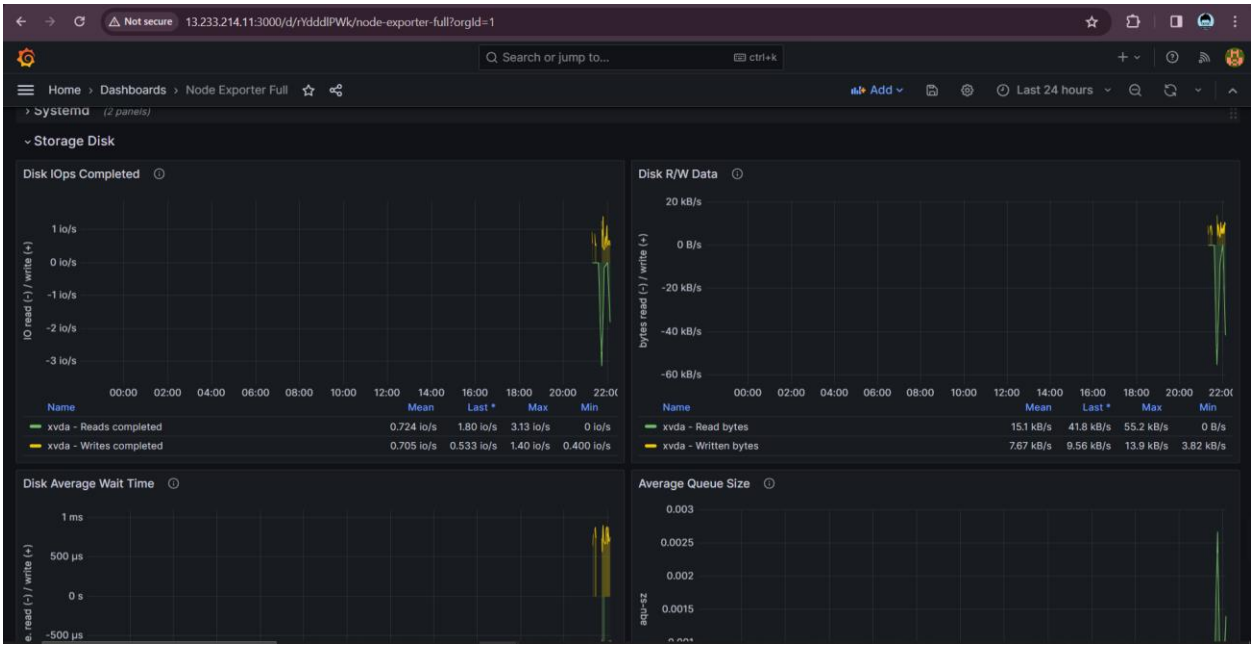
- Checking CPU utilization for our instance .



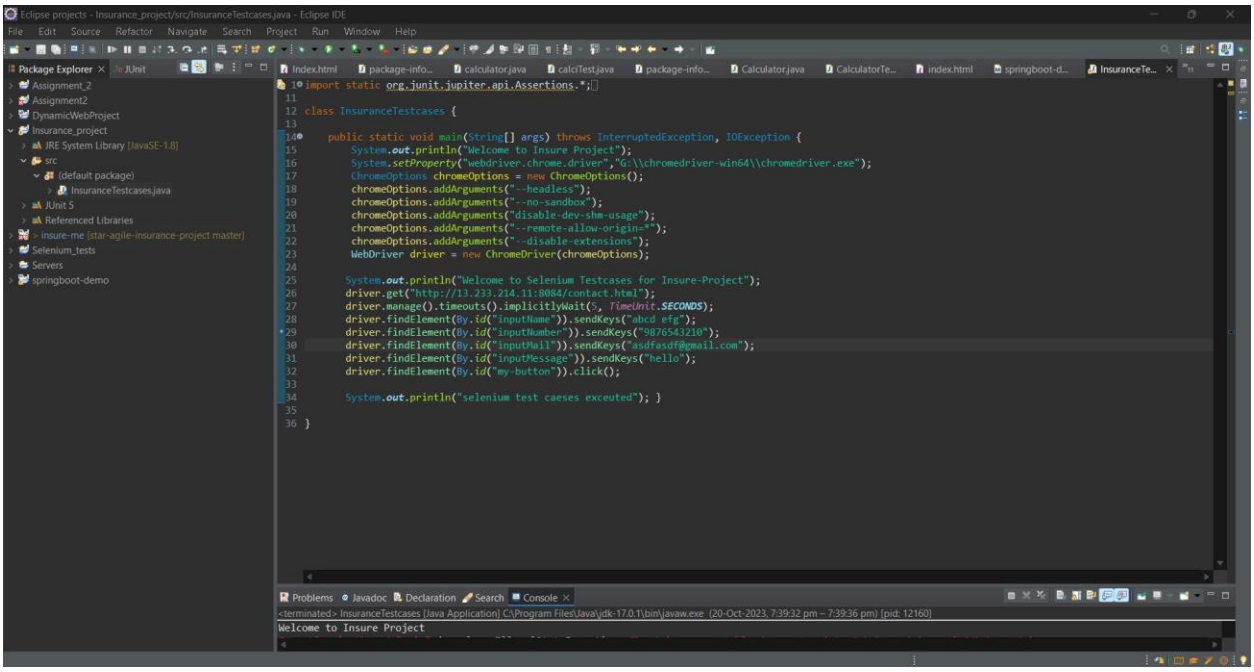
- Checking the CPU usage,memory stack, network trafic and disk space usage.

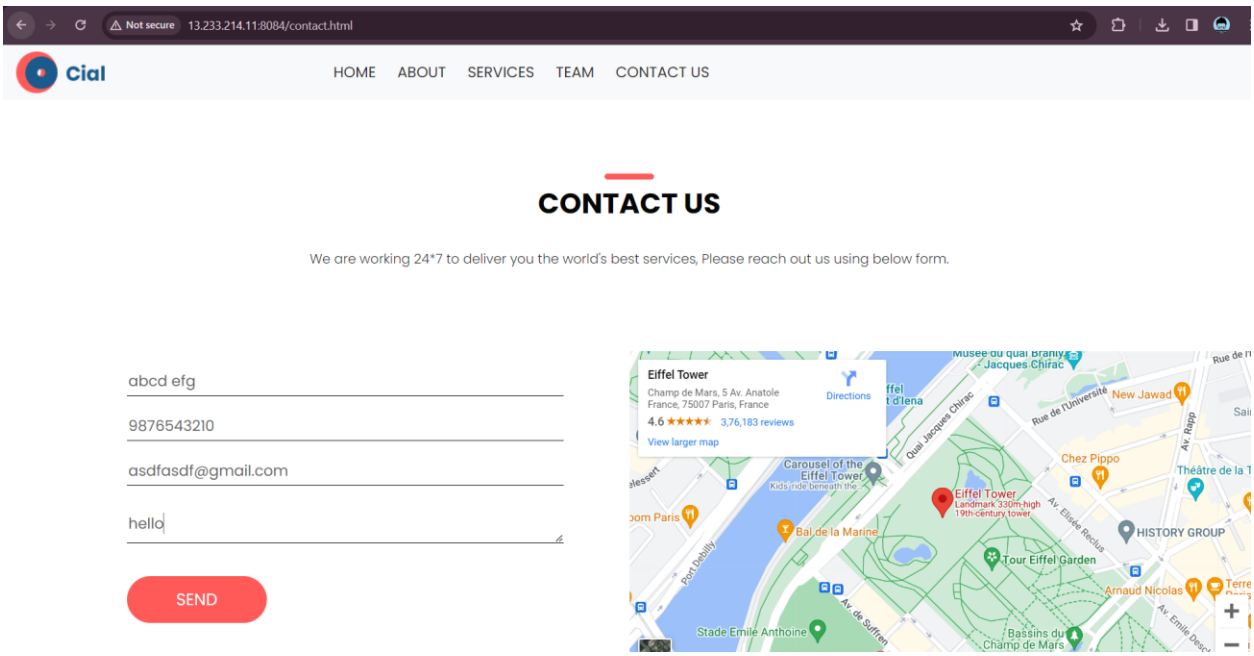


- Checking the storage Disk of our instance , disk iOps, Disk R/W data & etc.



- Writing the test cases for project and its output.





Thank you

armanbaig89@gmail.com