Online Shopping

Clone the below mentioned repo and deploy the application. (Run the application in port 80 [HTTP])

Repo URL : https://github.com/sriram-R-krishnan/devops-build.git

This project demonstrates React application deployment using Docker compose and Jenkins for CI/CD.

Architecture Overview

Application: React
Containerization: Docker
CI/CD Pipeline: Jenkins
Cloud Provider: AWS
Monitoring & Observability: Prometheus and Grafana dashboards

Setup Instructions

Prerequisites

- Docker
- Docker Compose
- AWS CLI
- Jenkins

CI/CD Pipeline Explanation

Pipeline Stages

1. Code Checkout
2. Build Docker Image
3. Push Docker Image to Docker Hub
4. Deploy to Kubernetes

Pipeline Flow

- On code push to the Git repository, Jenkins automatically triggers the build via webhooks.
- The Docker image is built and pushed to Docker Hub.
- Jenkins Multibranch Pipeline deploy the application on the server.

Project Submission:

Github repo URL :
https://github.com/udhayakumarethiraj-git/Project_3_Online_shopping.git

Deployed site URL
Prod : http://13.235.54.222/
Dev : http://13.235.54.222:8080/

Docker images name
Dev : udhayakumarethiraj/dev:latest
Prod : udhayakumarethiraj/prod:latest

Project Screenshots and Proof of Implementation

This section includes screenshots that provide visual proof of the successful implementation and execution of the project. The screenshots demonstrate key stages and components of the deployment, including:

- ❖ Source code repositories and project structure
- ❖ Successful Docker image build and push to Docker Hub
- ❖ Jenkins CI/CD pipeline execution (checkout, build, push, and deploy stages)
- ❖ Application accessibility via the exposed application URL
- ❖ Prometheus metrics collection and Grafana dashboards displaying real-time cluster and application health

These screenshots collectively validate the end-to-end workflow, from source code to a production-ready, containerized application deployed on Kubernetes.

Project Configuration and Deployment Files

The repository includes all necessary configuration files for this project, including the Dockerfile, Jenkinsfile, Prometheus datasource files, as well as build.sh and deploy.sh scripts.

URL : Link

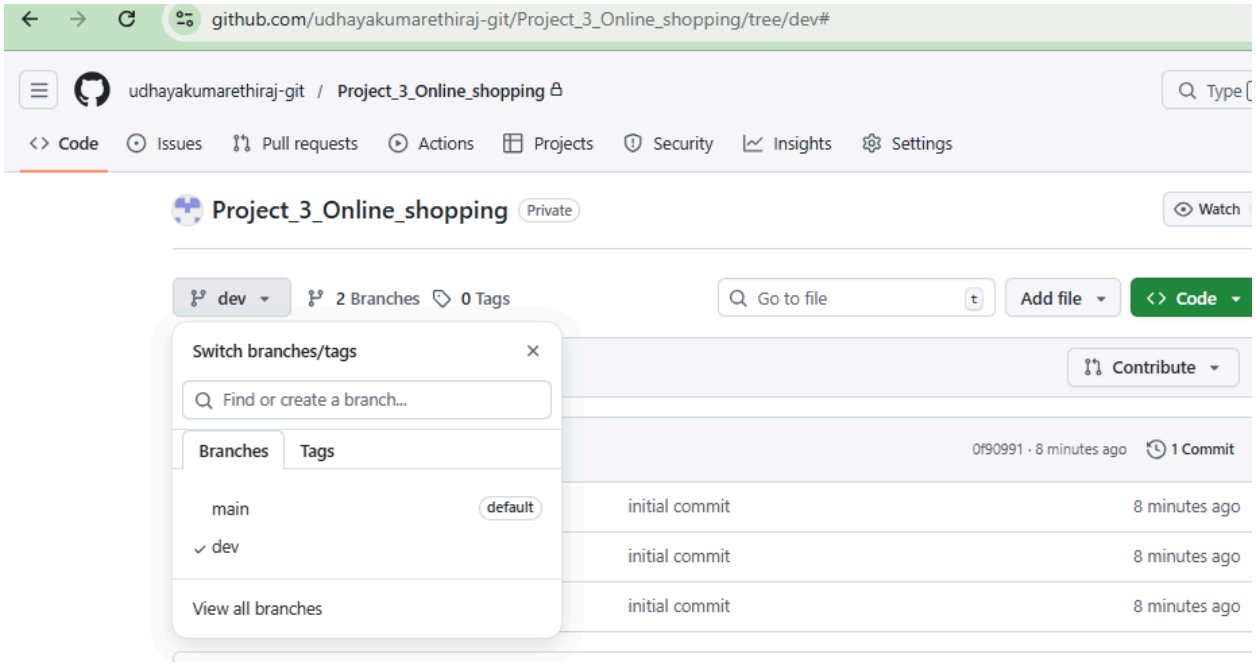
Stage : Application

Git repository have been created and cloned with 2 branches named main and dev

Project_3_Online_shopping (Private):

URL : https://github.com/udhayakumarethiraj-git/Project_3_Online_shopping.git

```
ubuntu@ip-172-31-28-193:~/projects/project_3$ git pull origin main
From github.com:udhayakumarethiraj-git/Project_3_Online_shopping
 * branch            main       -> FETCH_HEAD
Already up to date.
ubuntu@ip-172-31-28-193:~/projects/project_3$ ll
total 24
drwxrwxr-x 4 ubuntu ubuntu 4096 Jan 29 08:12 ./
drwxrwxr-x 6 ubuntu ubuntu 4096 Jan 28 06:15 ../
drwxrwxr-x 8 ubuntu ubuntu 4096 Jan 29 08:28 .git/
-rw-rw-r-- 1 ubuntu ubuntu  237 Jan 28 06:21 Dockerfile
drwxrwxr-x 3 ubuntu ubuntu 4096 Jan 29 08:21 devops-build/
-rw-rw-r-- 1 ubuntu ubuntu  146 Jan 28 06:44 docker-compose.yml
ubuntu@ip-172-31-28-193:~/projects/project_3$ git checkout dev
Switched to branch 'dev'
ubuntu@ip-172-31-28-193:~/projects/project_3$ git pull origin dev
From github.com:udhayakumarethiraj-git/Project_3_Online_shopping
 * branch            dev        -> FETCH_HEAD
Already up to date.
ubuntu@ip-172-31-28-193:~/projects/project_3$ git remote -v
origin  git@github.com:udhayakumarethiraj-git/Project_3_Online_shopping.git (fetch)
origin  git@github.com:udhayakumarethiraj-git/Project_3_Online_shopping.git (push)
ubuntu@ip-172-31-28-193:~/projects/project_3$ vi Dockerfile
ubuntu@ip-172-31-28-193:~/projects/project_3$ ll
total 24
drwxrwxr-x 4 ubuntu ubuntu 4096 Jan 29 08:30 ./
drwxrwxr-x 6 ubuntu ubuntu 4096 Jan 28 06:15 ../
drwxrwxr-x 8 ubuntu ubuntu 4096 Jan 29 08:29 .git/
-rw-rw-r-- 1 ubuntu ubuntu  237 Jan 28 06:21 Dockerfile
drwxrwxr-x 3 ubuntu ubuntu 4096 Jan 29 08:21 devops-build/
-rw-rw-r-- 1 ubuntu ubuntu  146 Jan 28 06:44 docker-compose.yml
ubuntu@ip-172-31-28-193:~/projects/project_3$
```



Stage : Docker

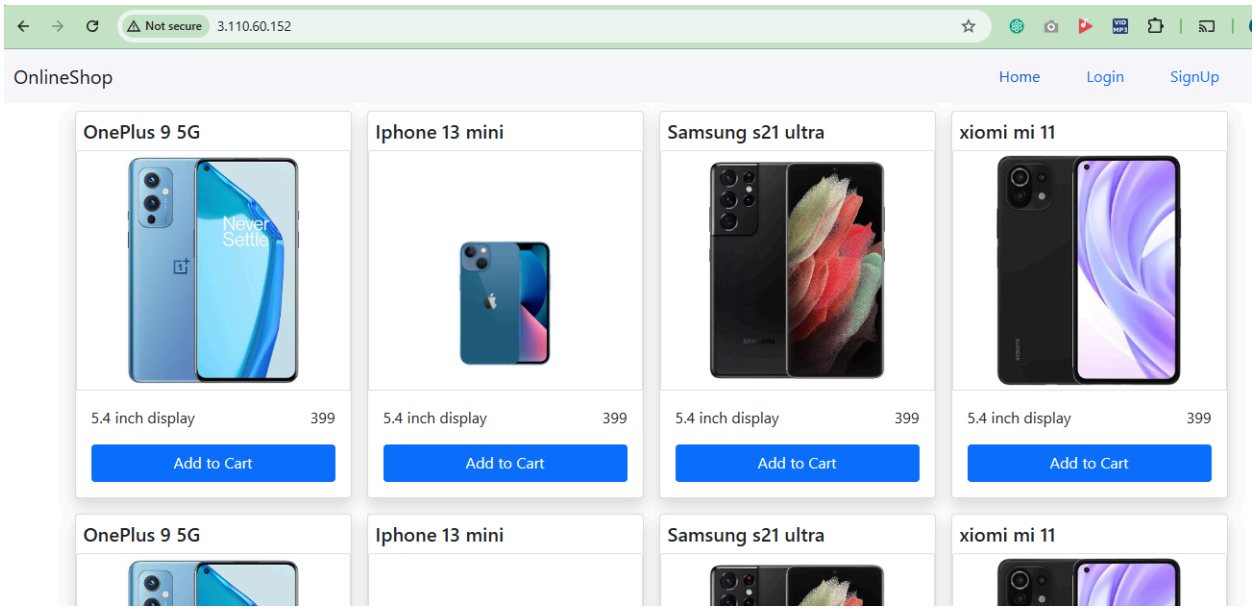
Containerize the application by creating a Dockerfile, building the image, and testing the output.

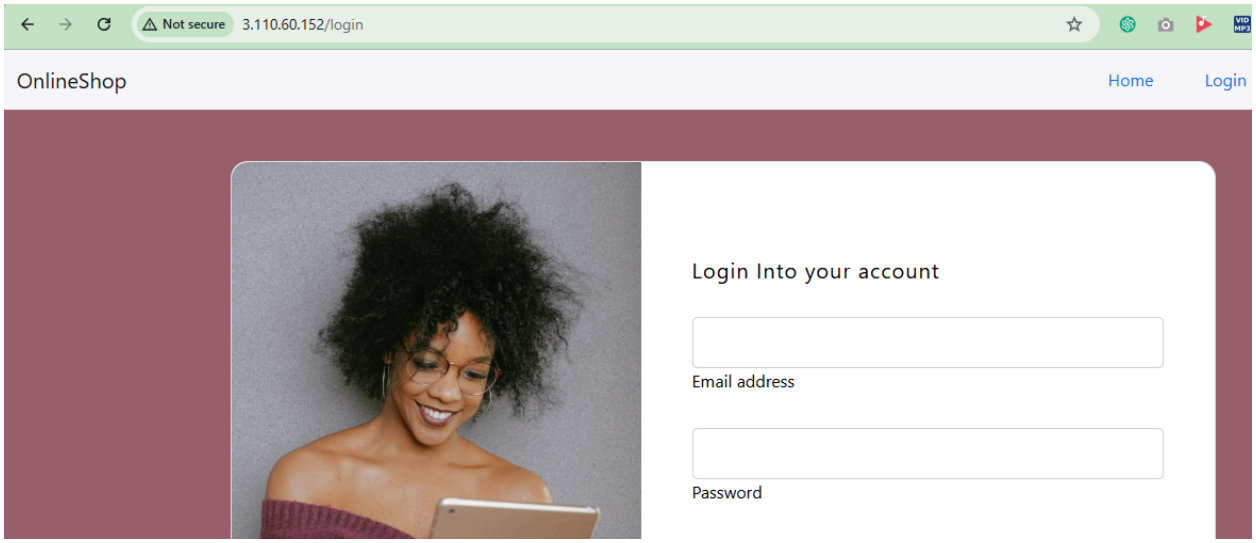
A Dockerfile was created to containerize the application, the Docker image was successfully built, and the output was verified by running the Docker container.

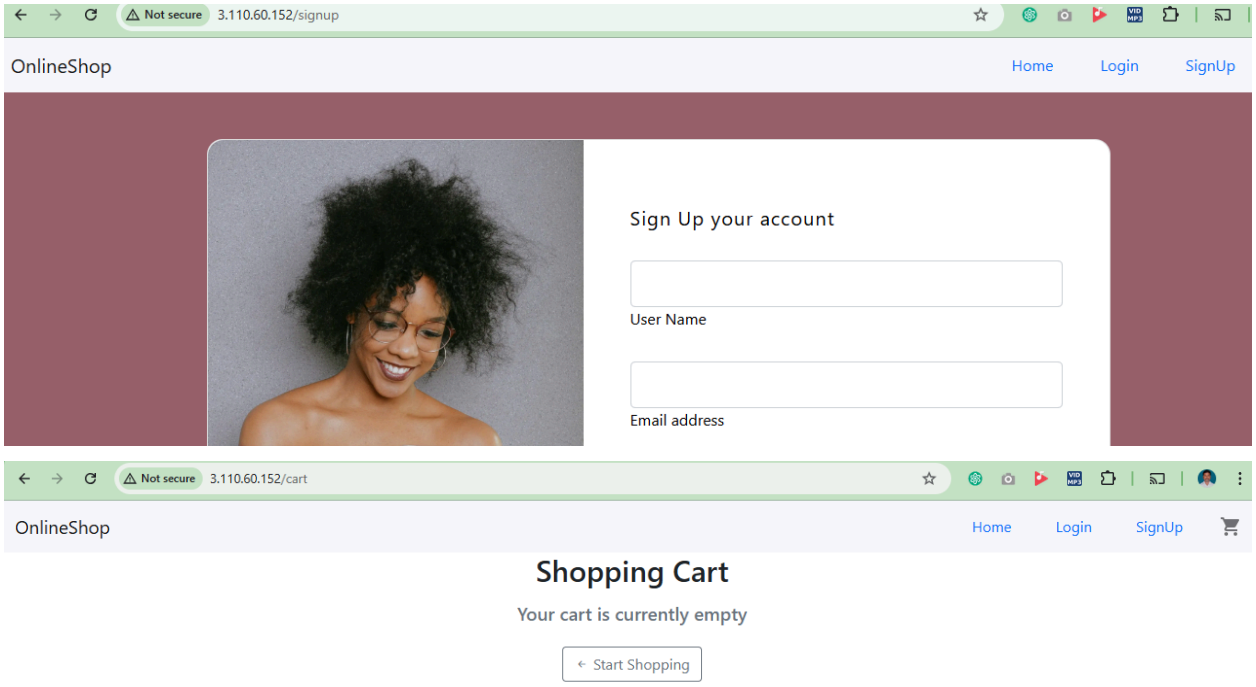
```
ubuntu@ip-172-31-28-193:~/projects/project_3$ ll
total 24
drwxrwxr-x 4 ubuntu ubuntu 4096 Jan 29 08:30 ./
drwxrwxr-x 6 ubuntu ubuntu 4096 Jan 28 06:15 ../
drwxrwxr-x 8 ubuntu ubuntu 4096 Jan 29 08:29 .git/
-rw-rw-r-- 1 ubuntu ubuntu  237 Jan 28 06:21 Dockerfile
drwxrwxr-x 3 ubuntu ubuntu 4096 Jan 29 08:21 devops-build/
-rw-rw-r-- 1 ubuntu ubuntu  146 Jan 28 06:44 docker-compose.yml
ubuntu@ip-172-31-28-193:~/projects/project_3$ more Dockerfile
FROM nginx:alpine

# Remove default nginx static files
RUN rm -rf /usr/share/nginx/html/*

# Copy Vite build output to nginx
COPY devops-build/build /usr/share/nginx/html

# Expose port 80
EXPOSE 80

CMD ["nginx", "-g", "daemon off;"]


ubuntu@ip-172-31-28-193:~/projects/project_3$
```

```
ubuntu@ip-172-31-28-193:~/projects/project_3$ docker images
                                                                                    i Info →  U  In Use
IMAGE           ID             DISK USAGE   CONTENT SIZE   EXTRA
devops:latest   f4b1d7765243       95.6MB         26.7MB    U
ubuntu@ip-172-31-28-193:~/projects/project_3$ docker ps
CONTAINER ID   IMAGE           COMMAND                  CREATED        STATUS          PORTS                                   NAMES
e861c0fe234a   devops:latest   "/docker-entrypoint.…"   26 hours ago   Up 22 minutes   0.0.0.0:80->80/tcp, [::]:80->80/tcp   devops-bu
ild
ubuntu@ip-172-31-28-193:~/projects/project_3$
```

Output Test result







Stage : Bash Scripting

build.sh file created for build the docker image.

```
ubuntu@ip-172-31-28-193:~/projects/project_3$ ll
total 28
drwxrwxr-x 4 ubuntu ubuntu 4096 Jan 29 08:41 ./
drwxrwxr-x 6 ubuntu ubuntu 4096 Jan 28 06:15 ../
drwxrwxr-x 8 ubuntu ubuntu 4096 Jan 29 08:29 .git/
-rw-rw-r-- 1 ubuntu ubuntu  237 Jan 28 06:21 Dockerfile
-rwxrwxr-x 1 ubuntu ubuntu  383 Jan 29 08:41 build.sh*
drwxrwxr-x 3 ubuntu ubuntu 4096 Jan 29 08:21 devops-build/
-rw-rw-r-- 1 ubuntu ubuntu  146 Jan 28 06:44 docker-compose.yml
ubuntu@ip-172-31-28-193:~/projects/project_3$ more build.sh
#!/bin/bash

# Exit immediately if a command fails
set -e

# Variables
IMAGE_NAME="devops-build"
IMAGE_TAG="latest"
DOCKERFILE_PATH="Dockerfile"
BUILD_CONTEXT="."

echo "🚀 Building Docker image..."
echo "Image: ${IMAGE_NAME}:${IMAGE_TAG}"

docker build \
  -t ${IMAGE_NAME}:${IMAGE_TAG} \
  -f ${DOCKERFILE_PATH} \
  ${BUILD_CONTEXT}

echo "☑ Docker image built successfully!"

ubuntu@ip-172-31-28-193:~/projects/project_3$
```

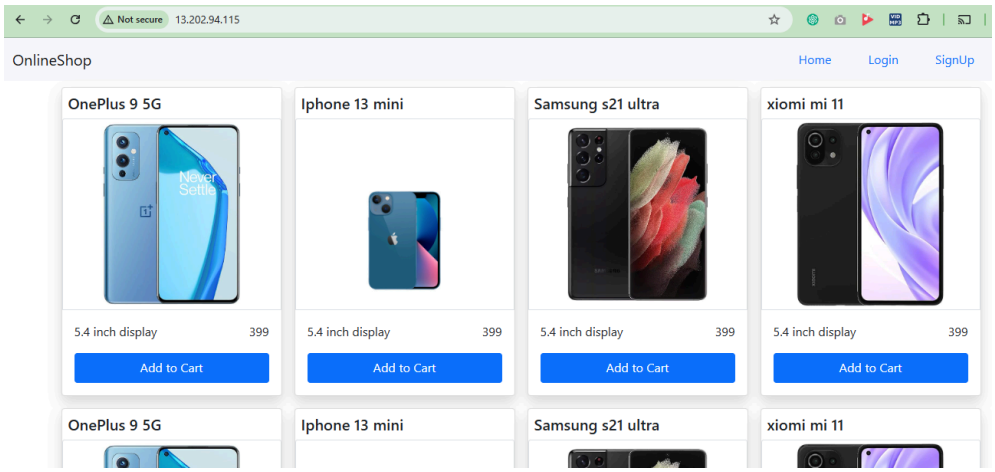
```
ubuntu@ip-172-31-28-193:~/projects/project_3$ ./build.sh
 Building Docker image...
Image: devops-build:latest
[+] Building 0.9s (8/8) FINISHED                                                                                    docker:default
 => [internal] load build definition from Dockerfile                                                                          0.0s
 => => transferring dockerfile: 276B                                                                                          0.0s
 => [internal] load metadata for docker.io/library/nginx:alpine                                                               0.7s
 => [internal] load .dockerignore                                                                                             0.0s
 => => transferring context: 2B                                                                                               0.0s
 => [1/3] FROM docker.io/library/nginx:alpine@sha256:7d7a15b8a280c661051955f14c2b91fed3e23724ddba18d2f53e8b44e74ab37a         0.0s
 => => resolve docker.io/library/nginx:alpine@sha256:7d7a15b8a280c661051955f14c2b91fed3e23724ddba18d2f53e8b44e74ab37a         0.0s
 => [internal] load build context                                                                                             0.0s
 => => transferring context: 1.12kB                                                                                           0.0s
 => CACHED [2/3] RUN rm -rf /usr/share/nginx/html/*                                                                           0.0s
 => CACHED [3/3] COPY devops-build/build /usr/share/nginx/html                                                                0.0s
 => exporting to image                                                                                                        0.1s
 => => exporting layers                                                                                                       0.0s
 => => exporting manifest sha256:05475ca27954a40fd97591cd6b02df3510c78e4b31fe36648a2727357626e7c1                             0.0s
 => => exporting config sha256:bc2850f174cf69bbf46584d907585db5b22bb2685731f1541ca5d237cc26bb9e                               0.0s
 => => exporting attestation manifest sha256:8cf70c40c9dca536be3913b9d34ed50c67f0e142b7a58fa5d2024c5b574ae2b7                 0.0s
 => => exporting manifest list sha256:61b41fca6dcae5bacff84347ea88af7ddeec8c3e3e33553fe09d5b68ed936c26                        0.0s
 => => naming to docker.io/library/devops-build:latest                                                                        0.0s
 => => unpacking to docker.io/library/devops-build:latest                                                                     0.0s
 Docker image built successfully!
ubuntu@ip-172-31-28-193:~/projects/project_3$ docker images
                                                                                                    I Info →  U  In Use
IMAGE                ID             DISK USAGE   CONTENT SIZE   EXTRA
devops-build:latest  61b41fca6dca       95.6MB         26.7MB
ubuntu@ip-172-31-28-193:~/projects/project_3$
```

deploy.sh file created to deploy the docker image on remote server

```
ubuntu@ip-172-31-28-193:~/projects/project_3$ ll
total 36
drwxrwxr-x 4 ubuntu ubuntu 4096 Jan 29 09:36 ./
drwxrwxr-x 6 ubuntu ubuntu 4096 Jan 28 06:15 ../
drwxrwxr-x 8 ubuntu ubuntu 4096 Jan 29 08:29 .git/
-rw-rw-r-- 1 ubuntu ubuntu  237 Jan 28 06:21 Dockerfile
-rwxrwxr-x 1 ubuntu ubuntu  383 Jan 29 08:41 build.sh*
-rwxrwxr-x 1 ubuntu ubuntu 1396 Jan 29 09:17 deploy.old*
-rwxrwxr-x 1 ubuntu ubuntu 1239 Jan 29 09:36 deploy.sh*
drwxrwxr-x 3 ubuntu ubuntu 4096 Jan 29 08:21 devops-build/
-rw-rw-r-- 1 ubuntu ubuntu  152 Jan 29 09:35 docker-compose.yml
ubuntu@ip-172-31-28-193:~/projects/project_3$
```

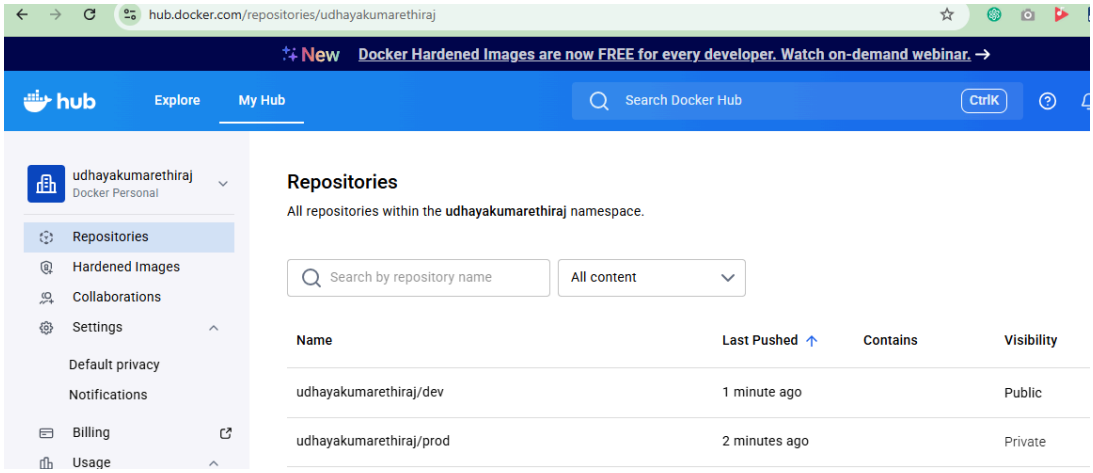
```
ubuntu@ip-172-31-28-193:~/projects/project_3$ ./deploy.sh
 Checking local Docker image...
 Saving Docker image...
 Copying files to remote server...
devops-build.tar                                                                      100%   25MB 152.5MB/s   00:00
docker-compose.yml                                                                    100%  152   292.4KB/s   00:00
 Deploying on remote server...
Pseudo-terminal will not be allocated because stdin is not a terminal.
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1044-aws x86_64)

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

 System information as of Thu Jan 29 09:36:17 UTC 2026

  System load:  0.0               Processes:               153
  Usage of /:   37.0% of 11.45GB  Users logged in:         1
  Memory usage: 12%               IPv4 address for enp39s0: 172.31.27.2
  Swap usage:   0%


Expanded Security Maintenance for Applications is not enabled.

7 updates can be applied immediately.
3 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

2 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

New release '24.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
```

```
 Loading Docker image...
Loaded image: devops-build:latest
 Stopping existing containers...
time="2026-01-29T09:36:19Z" level=warning msg="/home/ubuntu/project_3/docker-compose.yml: the attribute `version` is obsolete, it will
 be ignored, please remove it to avoid potential confusion"
▶ Starting containers...
time="2026-01-29T09:36:19Z" level=warning msg="/home/ubuntu/project_3/docker-compose.yml: the attribute `version` is obsolete, it will
 be ignored, please remove it to avoid potential confusion"
 Network project_3_default  Creating
 Network project_3_default  Created
 Container devops-build  Creating
 Container devops-build  Created
 Container devops-build  Starting
 Container devops-build  Started
 Running containers:
time="2026-01-29T09:36:20Z" level=warning msg="/home/ubuntu/project_3/docker-compose.yml: the attribute `version` is obsolete, it will
 be ignored, please remove it to avoid potential confusion"
NAME           IMAGE                  COMMAND                  SERVICE   CREATED         STATUS                  PORTS
devops-build   devops-build:latest    "/docker-entrypoint.…"   app       1 second ago    Up Less than a second   0.0.0.0:80->80/tcp, [::
]:80->80/tcp
 Deployment successful!
```



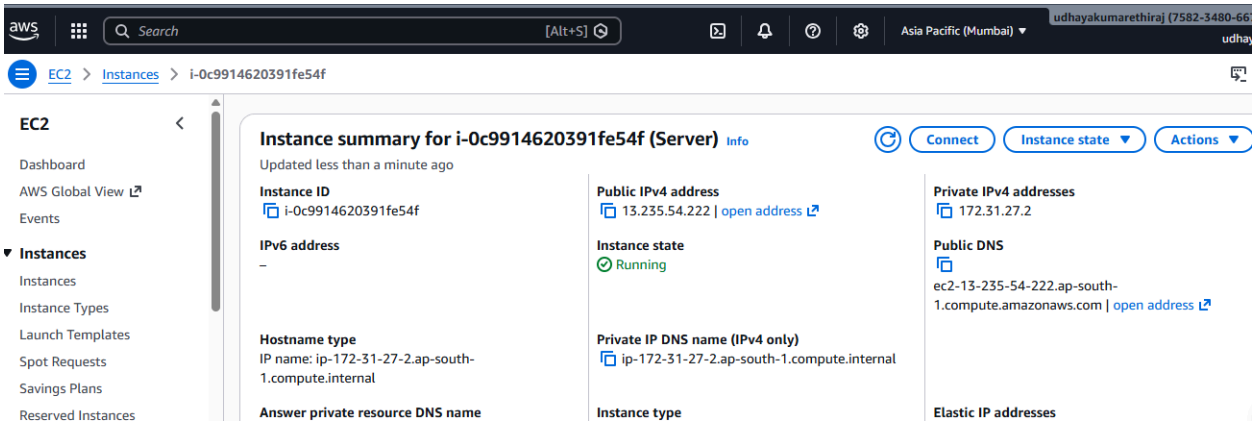
Stage : Docker HUB

Docker hub repo created

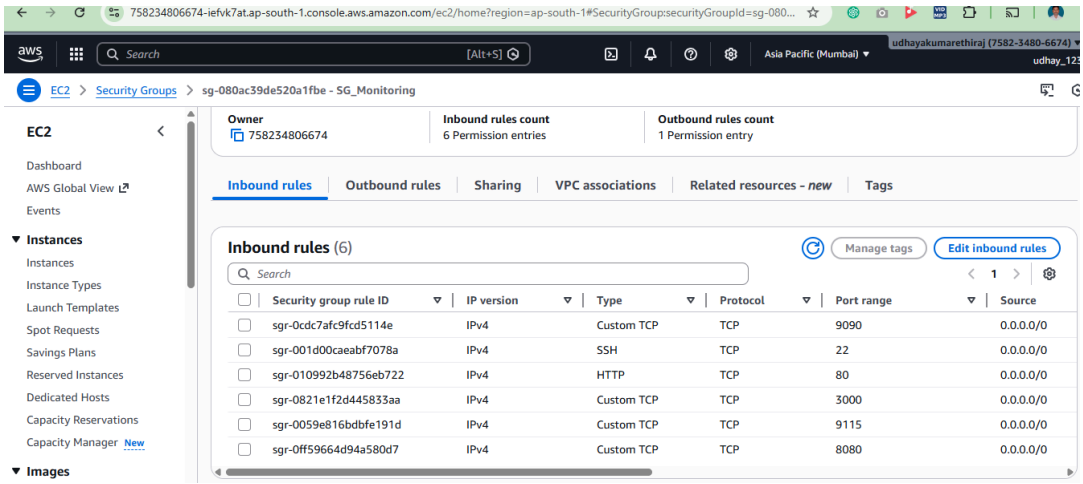


EC2 Instance

EC2 Instance launched to deploy the application



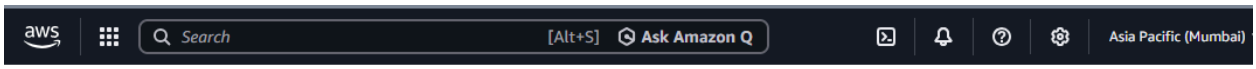
Security Group configuration



SSH to remote Server

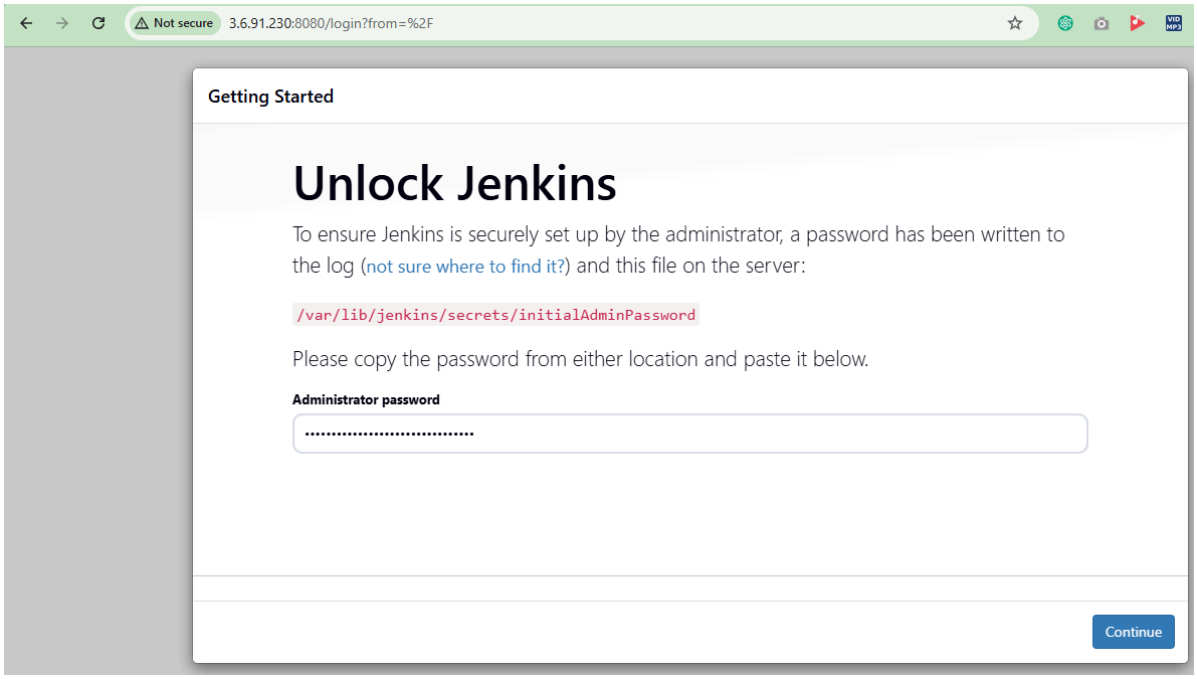
```
ubuntu@ip-172-31-28-193:~$ ssh ubuntu@172.31.27.2
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1044-aws x86_64)

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

 System information as of Fri Jan 30 22:48:51 UTC 2026

  System load:  0.0                Processes:               170
  Usage of /:   40.1% of 11.45GB   Users logged in:         0
  Memory usage: 12%                IPv4 address for enp39s0: 172.31.27.2
  Swap usage:   0%


Expanded Security Maintenance for Applications is not enabled.

5 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

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

New release '24.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Fri Jan 30 14:13:39 2026 from 49.37.200.197
ubuntu@ip-172-31-27-2:~$
```

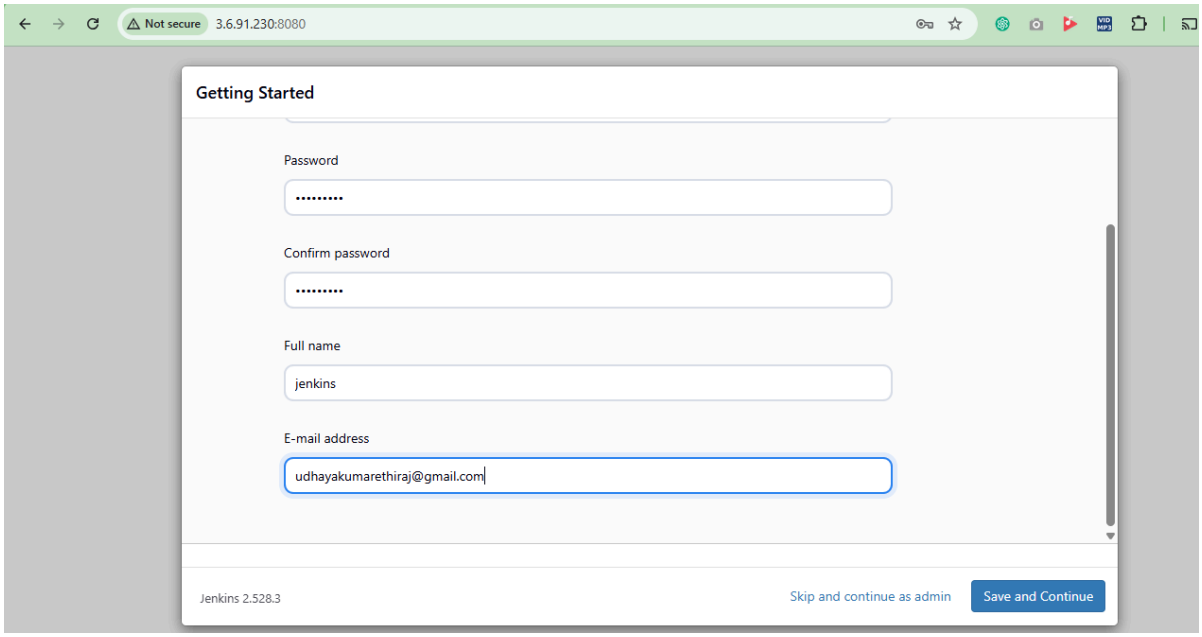
Installed packages

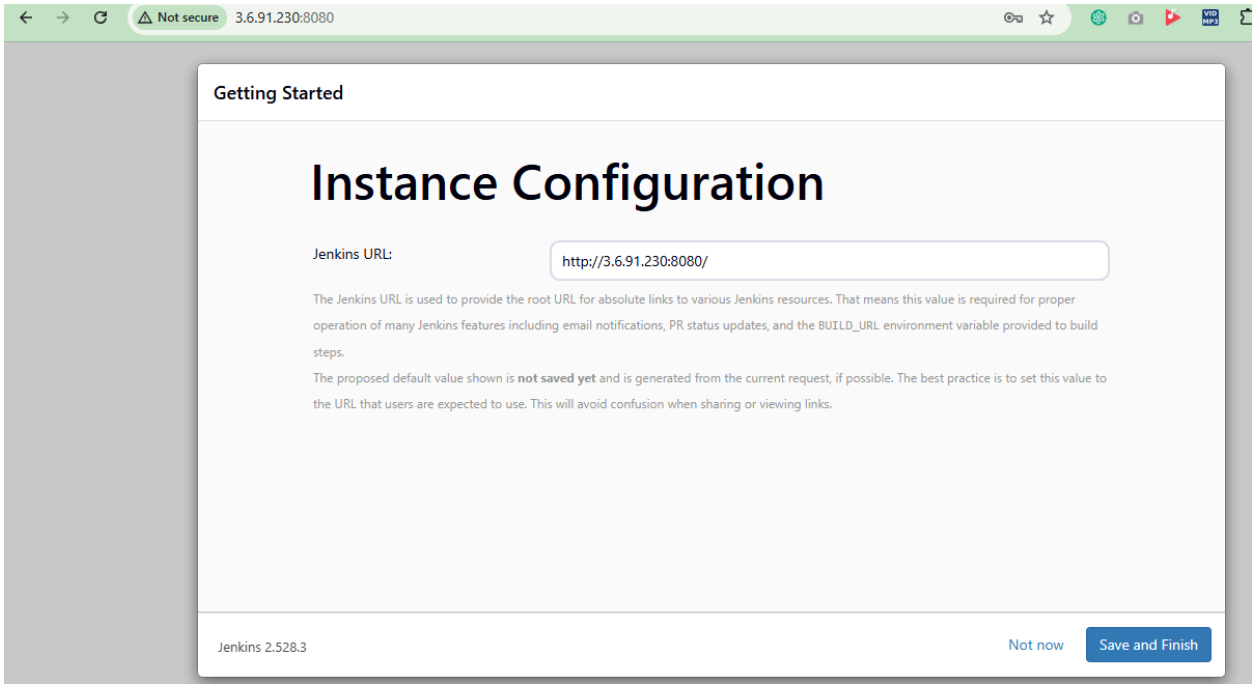


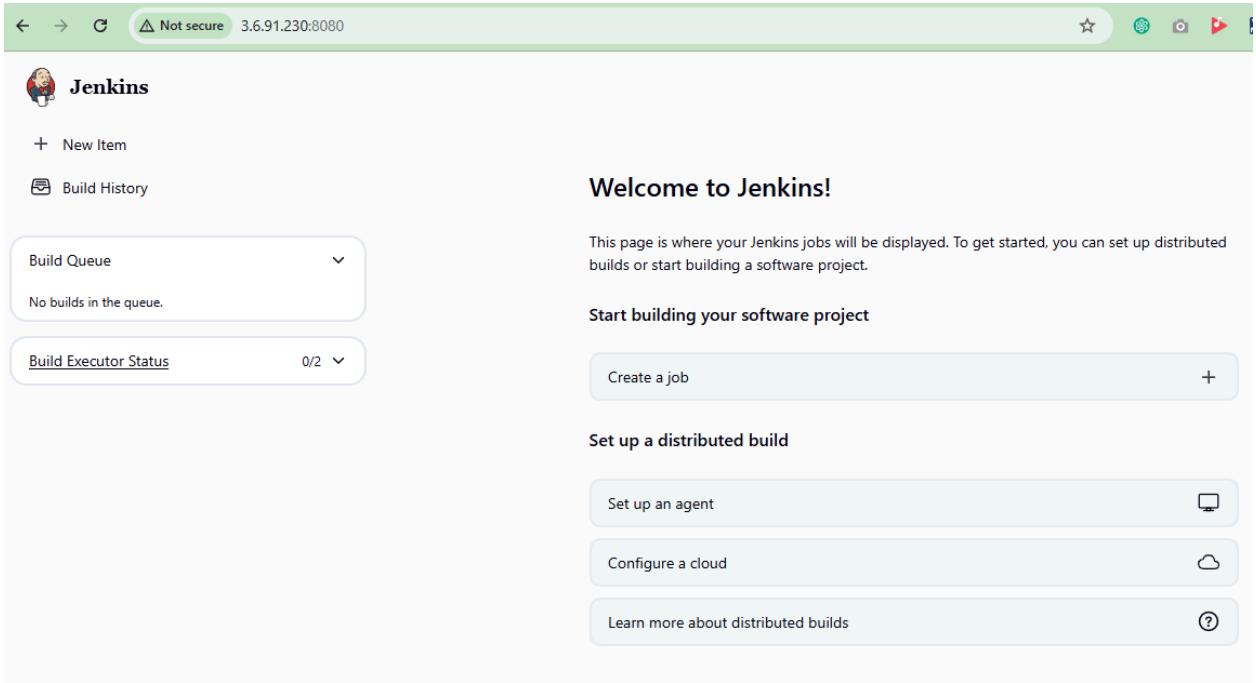

```
ubuntu@ip-10-0-101-40:~$ docker --version
Docker version 29.1.5, build 0e6fee6
ubuntu@ip-10-0-101-40:~$ git --version
git version 2.34.1
ubuntu@ip-10-0-101-40:~$ aws --version
aws-cli/2.33.2 Python/3.13.11 Linux/6.8.0-1044-aws exe/x86_64.ubuntu.22
ubuntu@ip-10-0-101-40:~$ eksctl version
0.221.0
ubuntu@ip-10-0-101-40:~$ jenkins --version
2.528.3
ubuntu@ip-10-0-101-40:~$ kubectl version
Client Version: v1.35.0
Kustomize Version: v5.7.1
Error from server (Forbidden): <html><head><meta http-equiv='refresh' content='1;url=/login?from=%2Fversion%3Ftimeout%3
ta-redirect-url='/login?from=%2Fversion%3Ftimeout%3D32s' src='/static/9194c520/scripts/redirect.js'></script></head><bo
e; color:white;'>
Authentication required
<!--
-->

</body></html>
ubuntu@ip-10-0-101-40:~$
```

Jenkins installed



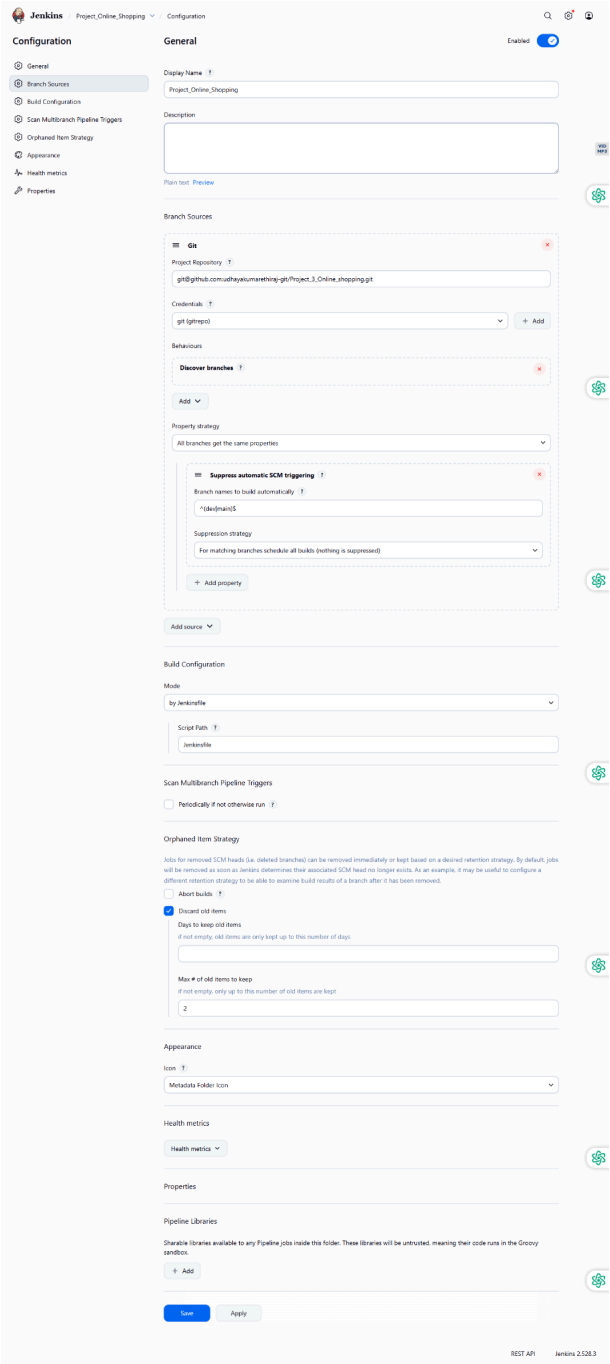


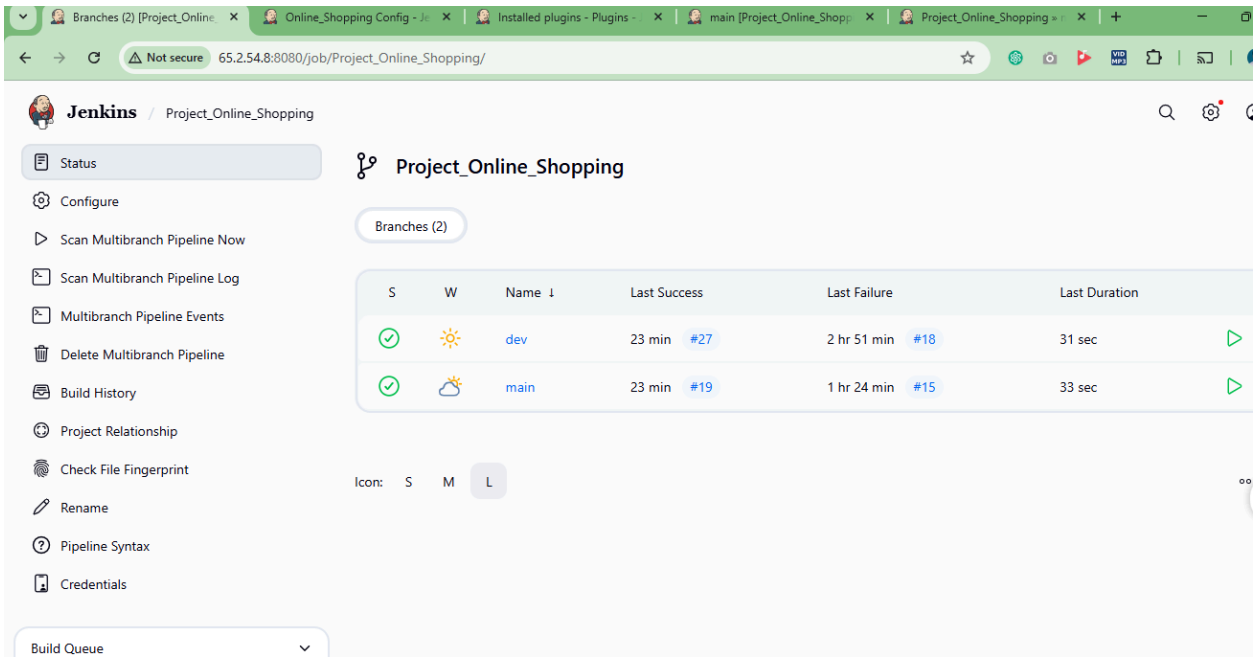

Not secure
3.6.91.230:8080
Getting Started
Instance Configuration
Jenkins URL:
http://3.6.91.230:8080/
The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.
The proposed default value shown is not saved yet and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.
Jenkins 2.528.3
Not now
Save and Finish


Not secure
3.6.91.230:8080
Jenkins
New Item
Build History
Build Queue
No builds in the queue.
Build Executor Status
0/2
Welcome to Jenkins!
This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.
Start building your software project
Create a job
Set up a distributed build
Set up an agent
Configure a cloud
Learn more about distributed builds

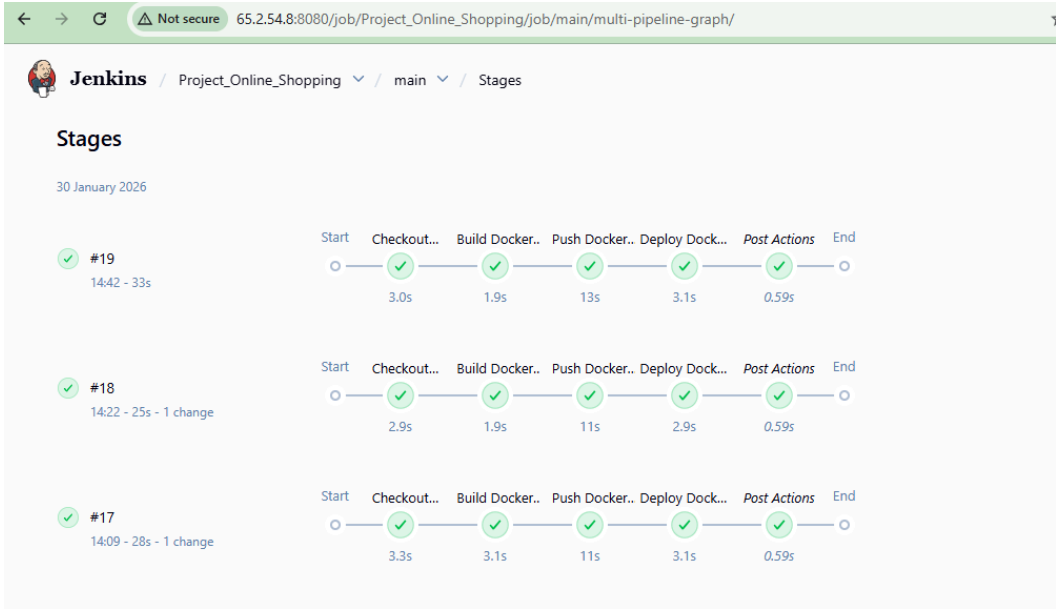
Stage : Jenkins

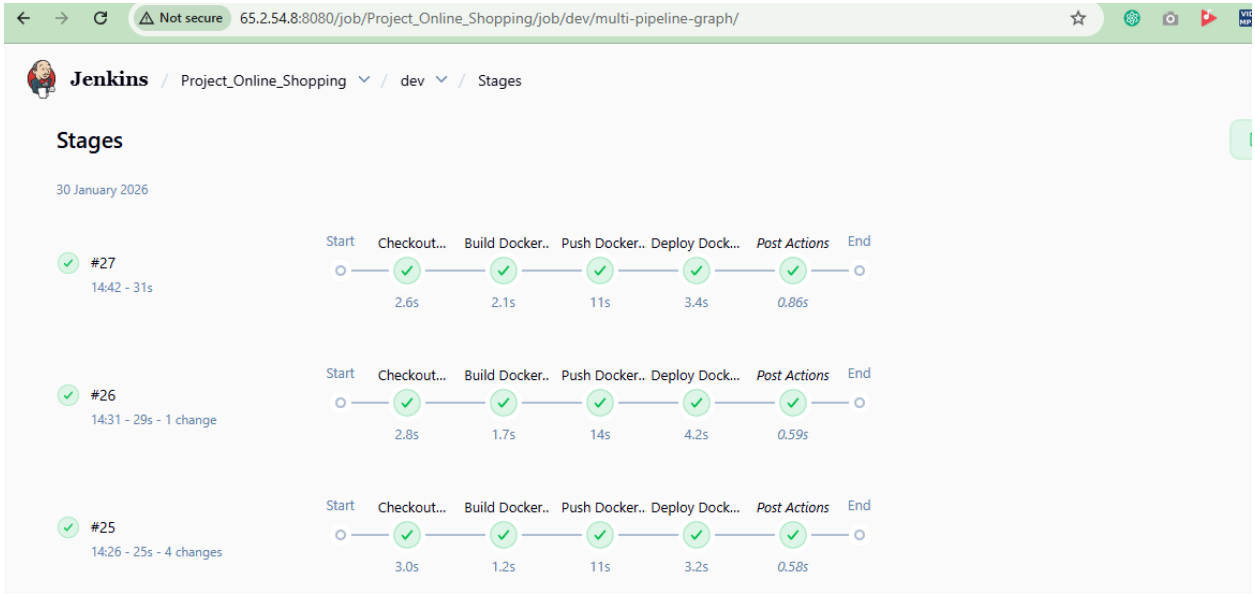
Multibranch pipeline created



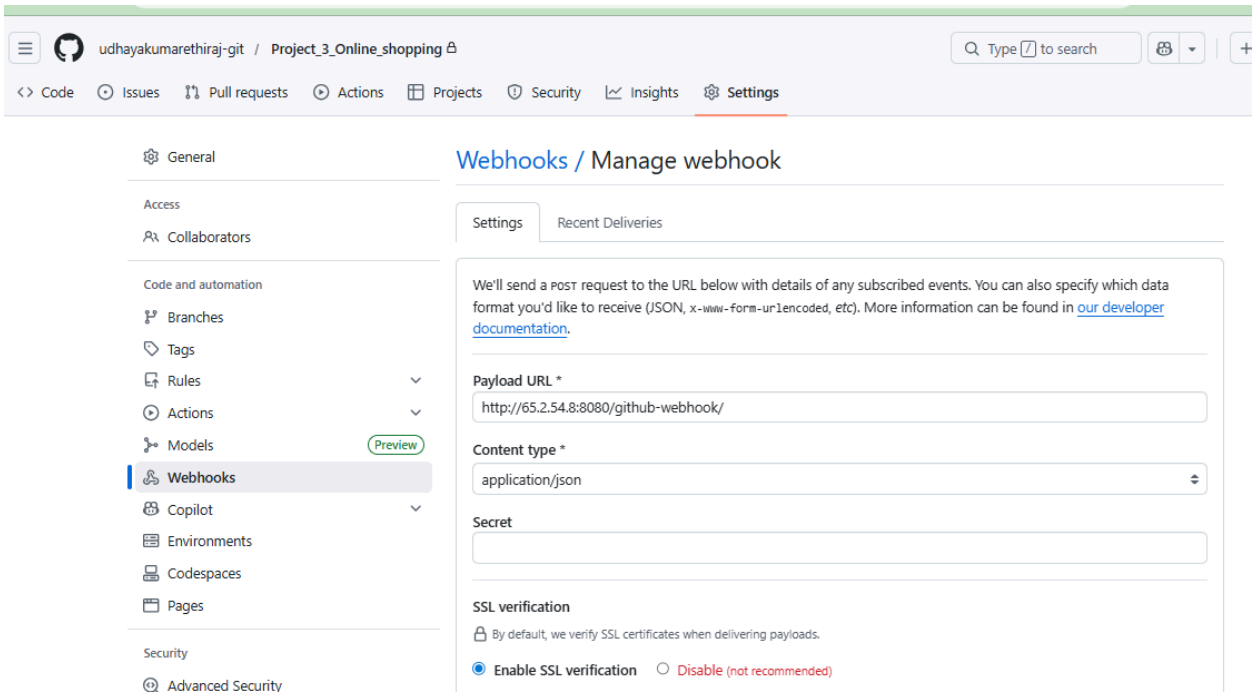


Jenkins Pipeline Stages

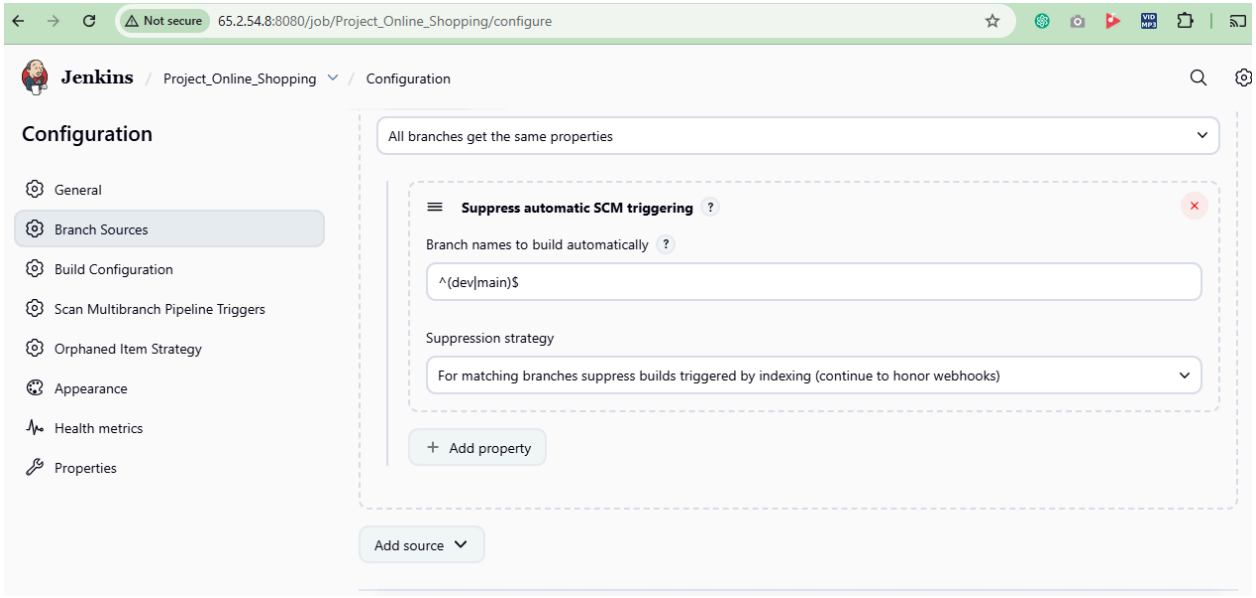




GitHub Webhook configured for build auto trigger



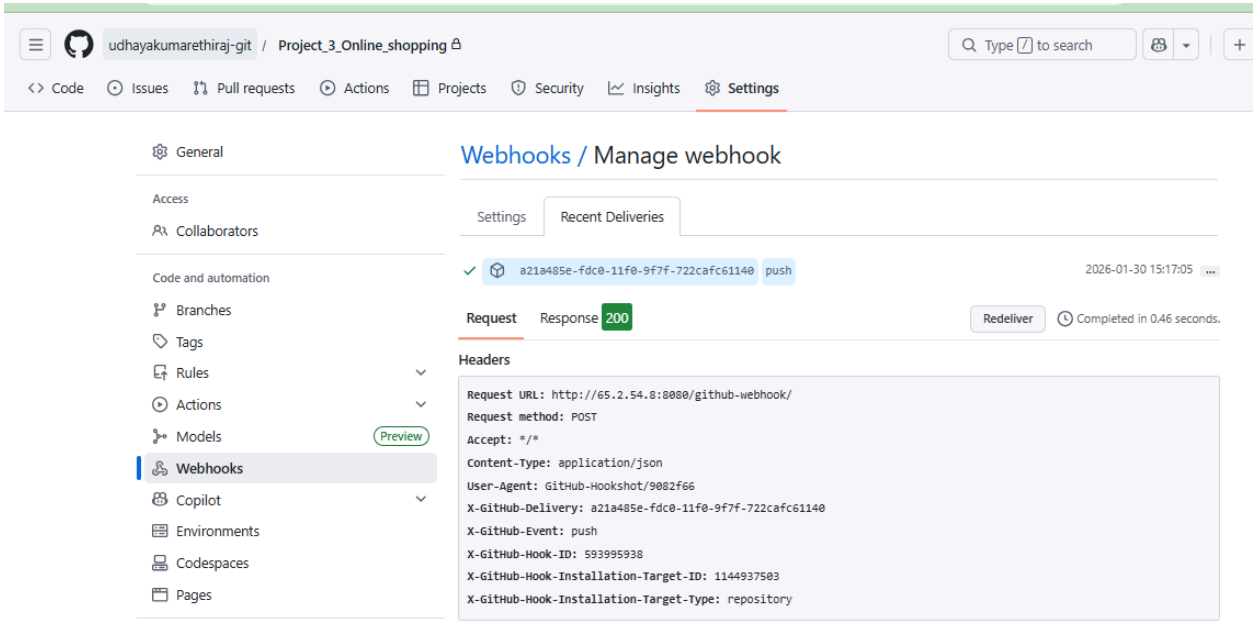
Jenkins configure for Build auto Trigger

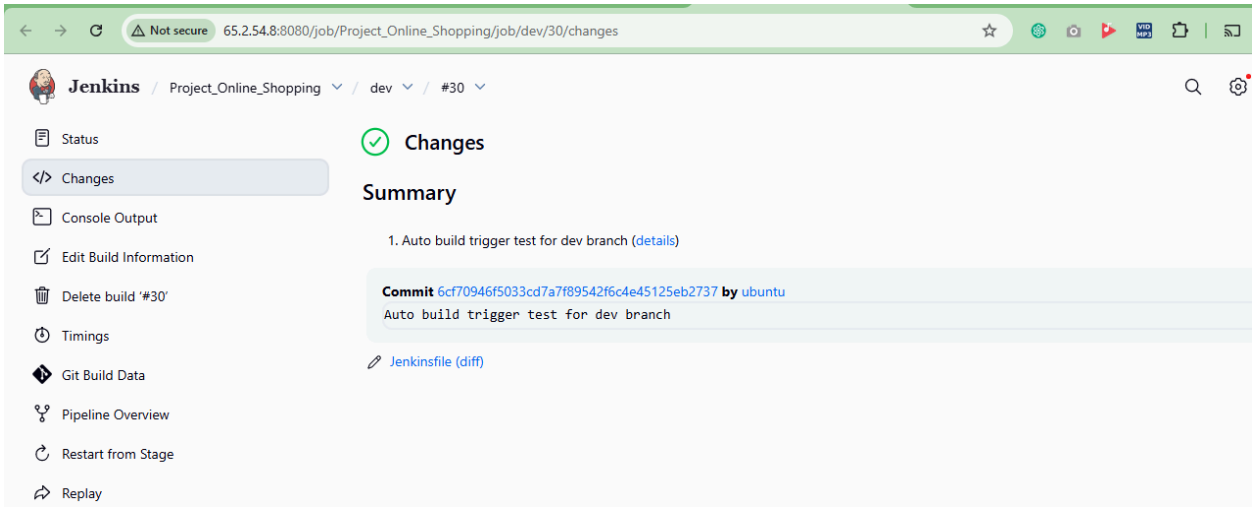


Committed in Dev branch

```
ubuntu@ip-172-31-28-193:~/projects/project_3$ vi Jenkinsfile
ubuntu@ip-172-31-28-193:~/projects/project_3$ git branch
* dev
  main
ubuntu@ip-172-31-28-193:~/projects/project_3$ git add .
ubuntu@ip-172-31-28-193:~/projects/project_3$ git commit -m "Jenkinsfile updated"
[dev 83c35f8] Jenkinsfile updated
 Committer: Ubuntu <ubuntu@ip-172-31-28-193.ap-south-1.compute.internal>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 1 file changed, 1 insertion(+)
ubuntu@ip-172-31-28-193:~/projects/project_3$ git push origin dev
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 310 bytes | 310.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:udhayakumarethiraj-git/Project_3_Online_shopping.git
   27b3cc8..83c35f8  dev -> dev
ubuntu@ip-172-31-28-193:~/projects/project_3$
```

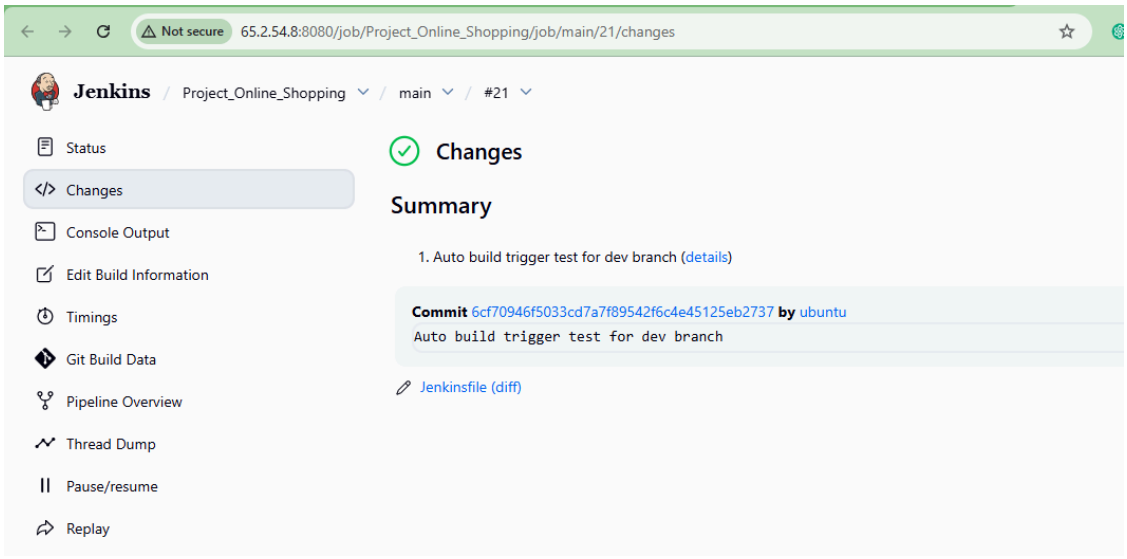
GitHub Webhook triggered



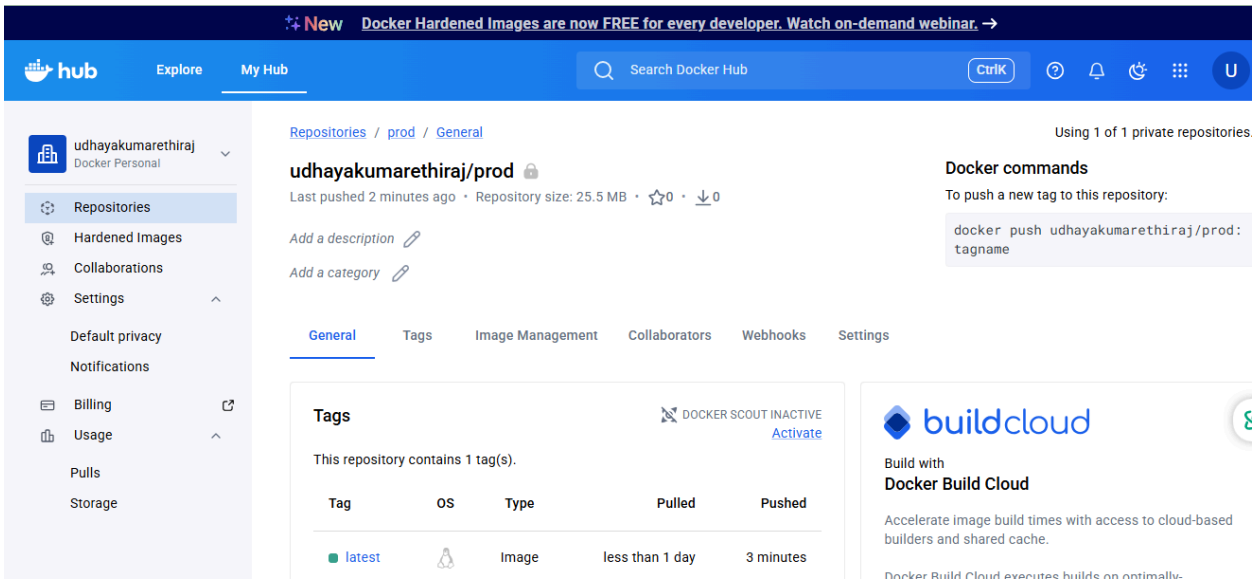


dev branch merged to main branch

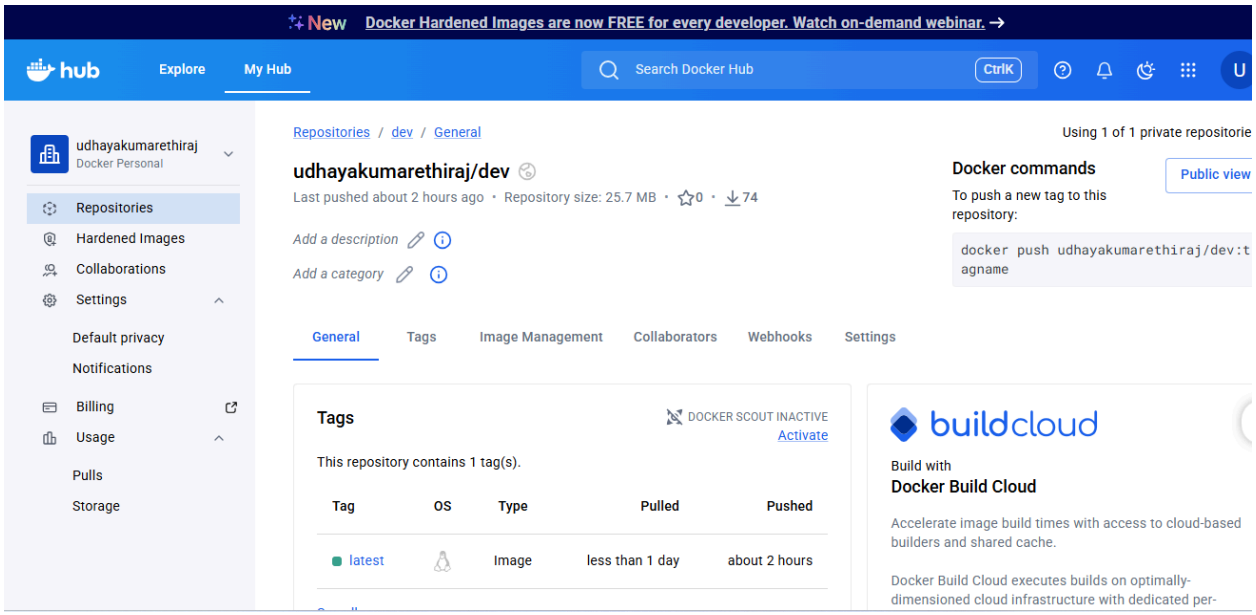
```
ubuntu@ip-172-31-28-193:~/projects/project_3$ git checkout main
Switched to branch 'main'
ubuntu@ip-172-31-28-193:~/projects/project_3$ git merge dev
Updating 5653e39..6cf7094
Fast-forward
 Jenkinsfile | 1 -
 1 file changed, 1 deletion(-)
ubuntu@ip-172-31-28-193:~/projects/project_3$ git push origin main
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:udhayakumarethiraj-git/Project_3_Online_shopping.git
   5653e39..6cf7094  main -> main
ubuntu@ip-172-31-28-193:~/projects/project_3$
```



DockerHub prod repo (Private) image pushed using Jenkins pipeline



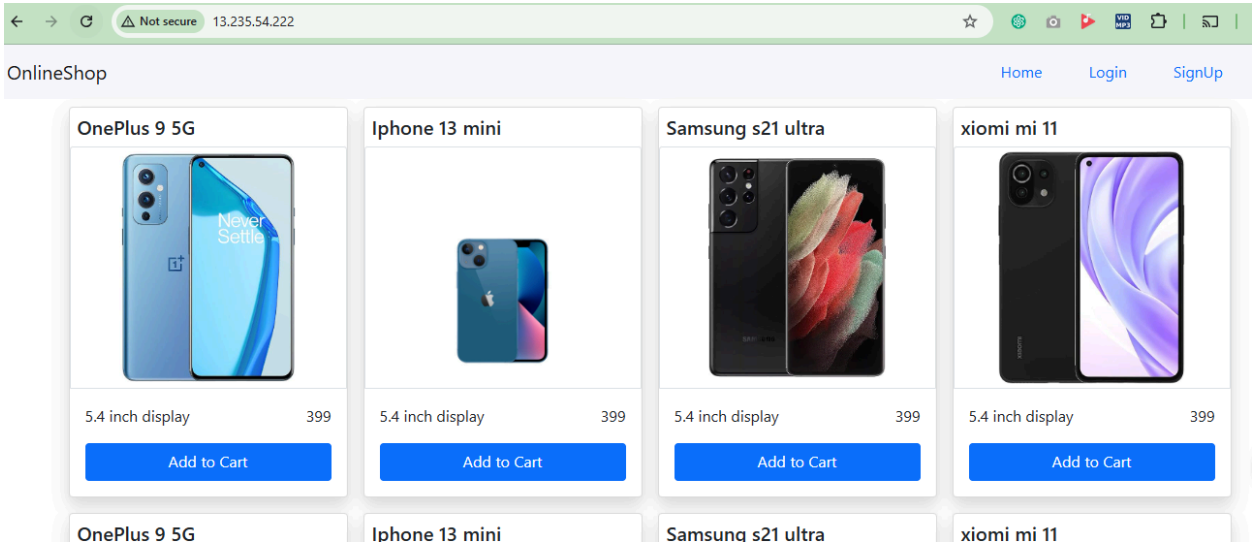
DockerHub dev repo (Public) image pushed using Jenkins pipeline



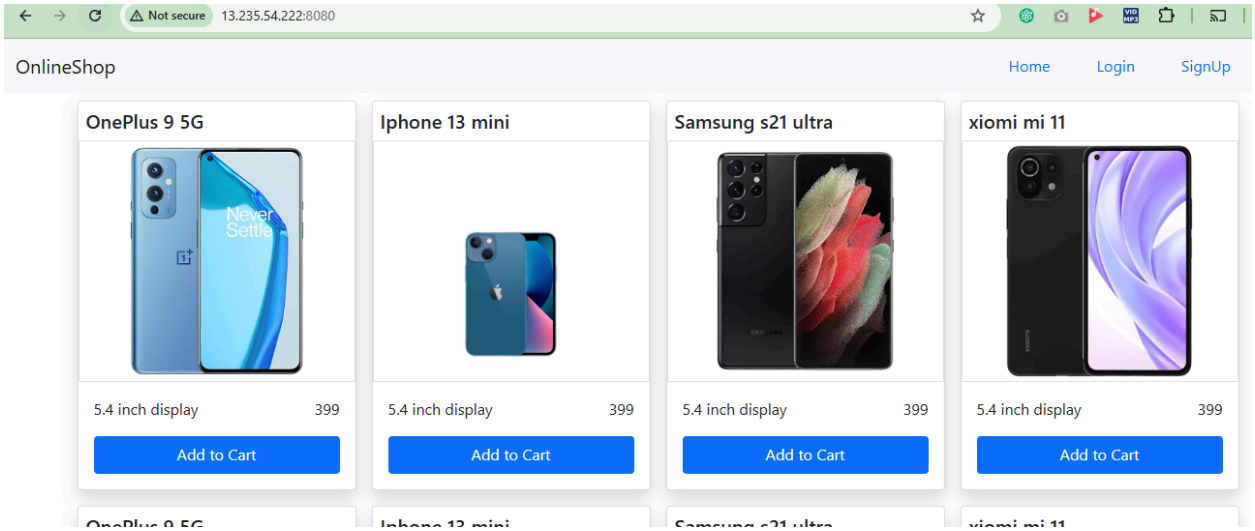
Jenkins dev branch Build Console Log : URL
Jenkins main branch Build Console Log : URL

Application Output

Prod



Dev



Stages : Monitoring

An open-source monitoring system was implemented using Prometheus to collect application metrics, and Grafana was configured with dashboards to monitor application health, application URL status, and real-time metrics data.

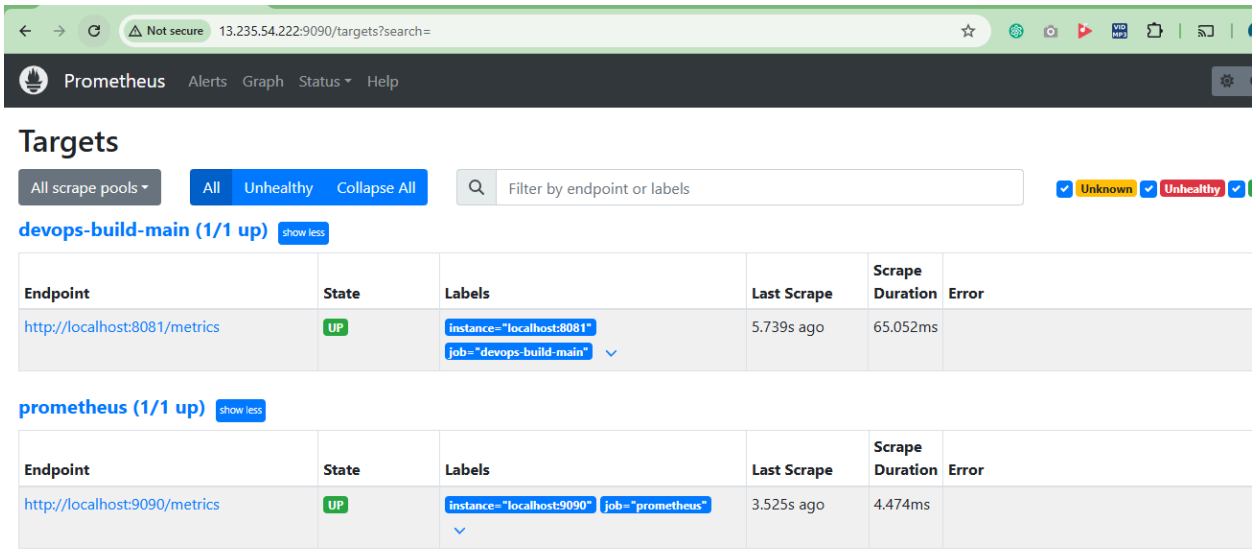
Container data metrics collection to Prometheus

```
ubuntu@ip-172-31-27-2:~/project_3$ cat cadvisor
version: "3.8"

services:
  cadvisor:
    image: gcr.io/cadvisor/cadvisor:latest
    container_name: cadvisor
    privileged: true
    ports:
      - "8081:8080"
    volumes:
      - /:/rootfs:ro
      - /var/run:/var/run:ro
      - /sys:/sys:ro
      - /var/lib/docker/:/var/lib/docker:ro
    restart: unless-stopped

ubuntu@ip-172-31-27-2:~/project_3$
```

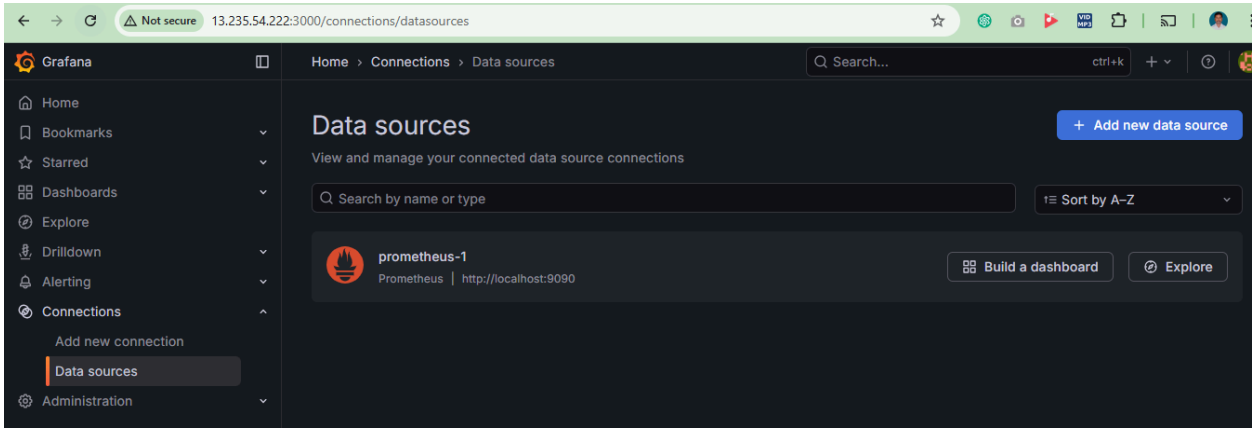
Application metrics config

```
ubuntu@ip-172-31-27-2:~/project_3$ sudo cat /etc/prometheus/prometheus.yml
global:
  scrape_interval: 15s

scrape_configs:
  # Prometheus self
  - job_name: "prometheus"
    static_configs:
      - targets: ["localhost:9090"]

  # cAdvisor metrics (filter only devops-build-main)
  - job_name: "devops-build-main"
    static_configs:
      - targets:
          - "localhost:8081"

ubuntu@ip-172-31-27-2:~/project_3$
```

Targets added to Prometheus



Added Data source to Grafana

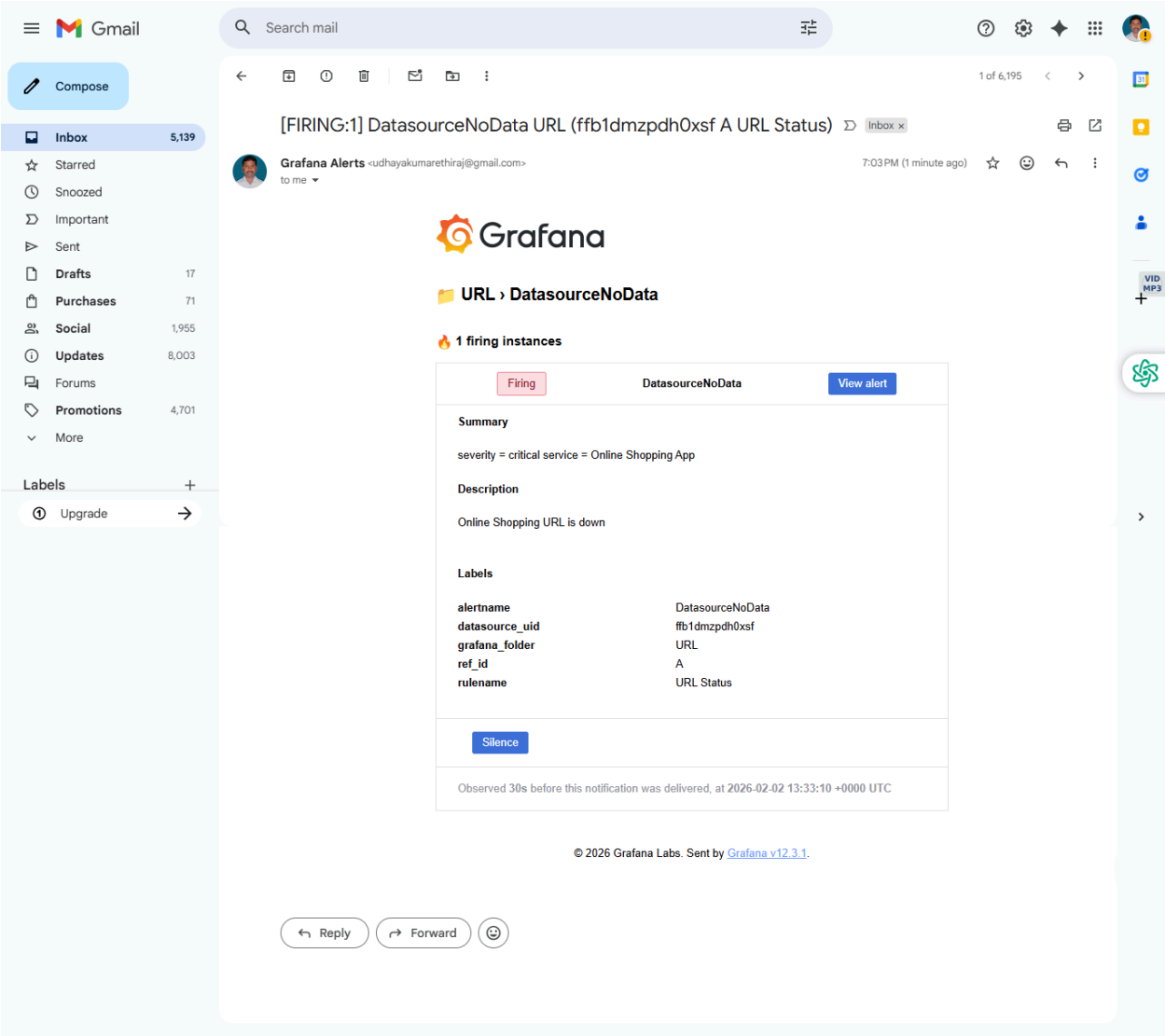


Grafana Dashboards :

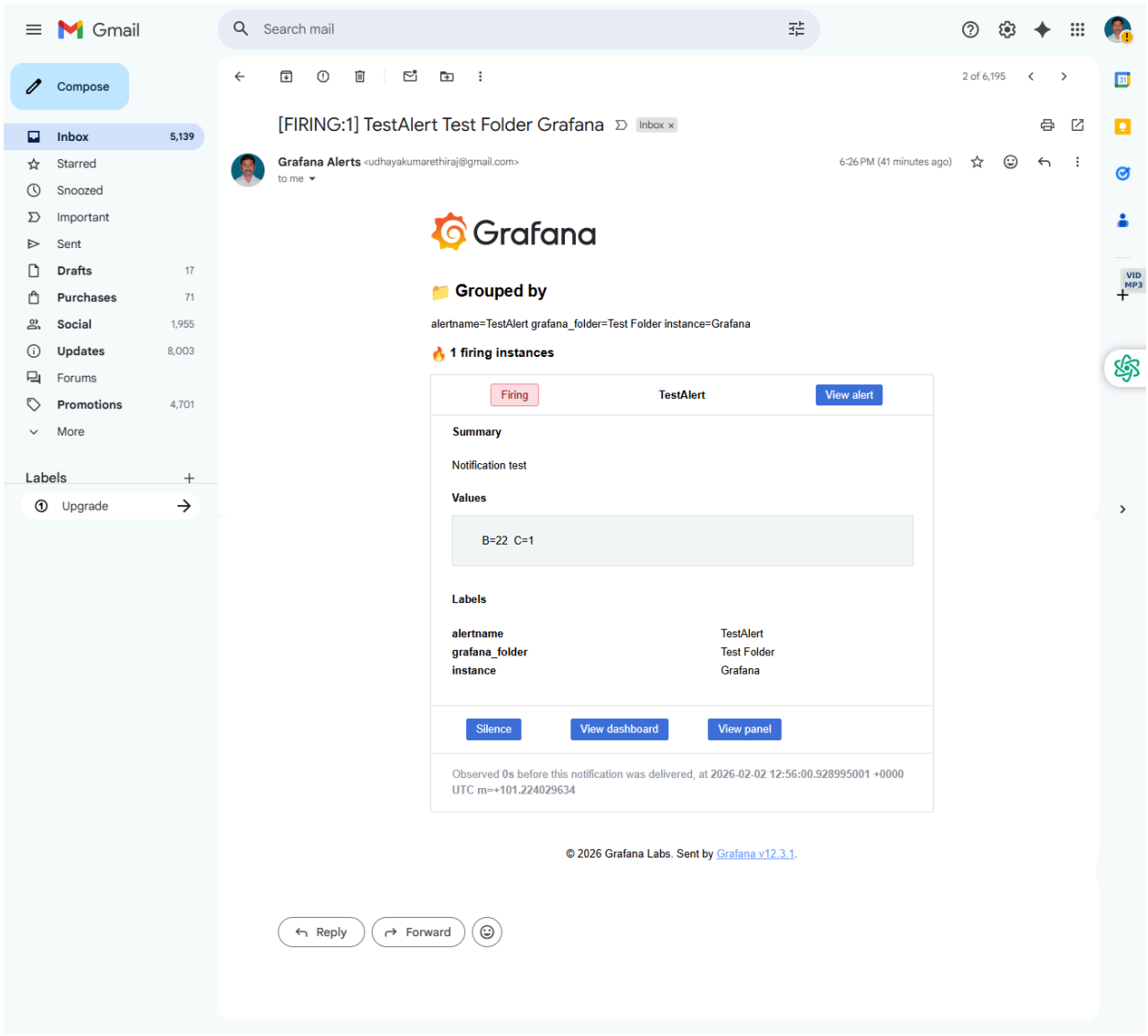
Application URL

Email Alerting:

Configured Email alerting in Grafana and tested for URL Down



Test Email


Gmail
Search mail
Compose
Inbox 5,139
Starred
Snoozed
Important
Sent
Drafts 17
Purchases 71
Social 1,955
Updates 8,003
Forums
Promotions 4,701
More
Labels
Upgrade
2 of 6,195
[FIRING:1] TestAlert Test Folder Grafana
Inbox ×
Grafana Alerts <udhayakumarethiraj@gmail.com>
to me
6:26 PM (41 minutes ago)
Grafana
Grouped by
alertname=TestAlert grafana_folder=Test Folder instance=Grafana
1 firing instances
Firing
TestAlert
View alert
Summary
Notification test
Values
B=22 C=1
Labels
alertname TestAlert
grafana_folder Test Folder
instance Grafana
Silence
View dashboard
View panel
Observed 0s before this notification was delivered, at 2026-02-02 12:56:00.928995001 +0000 UTC m=+101.224029634
© 2026 Grafana Labs. Sent by Grafana v12.3.1.
Reply
Forward