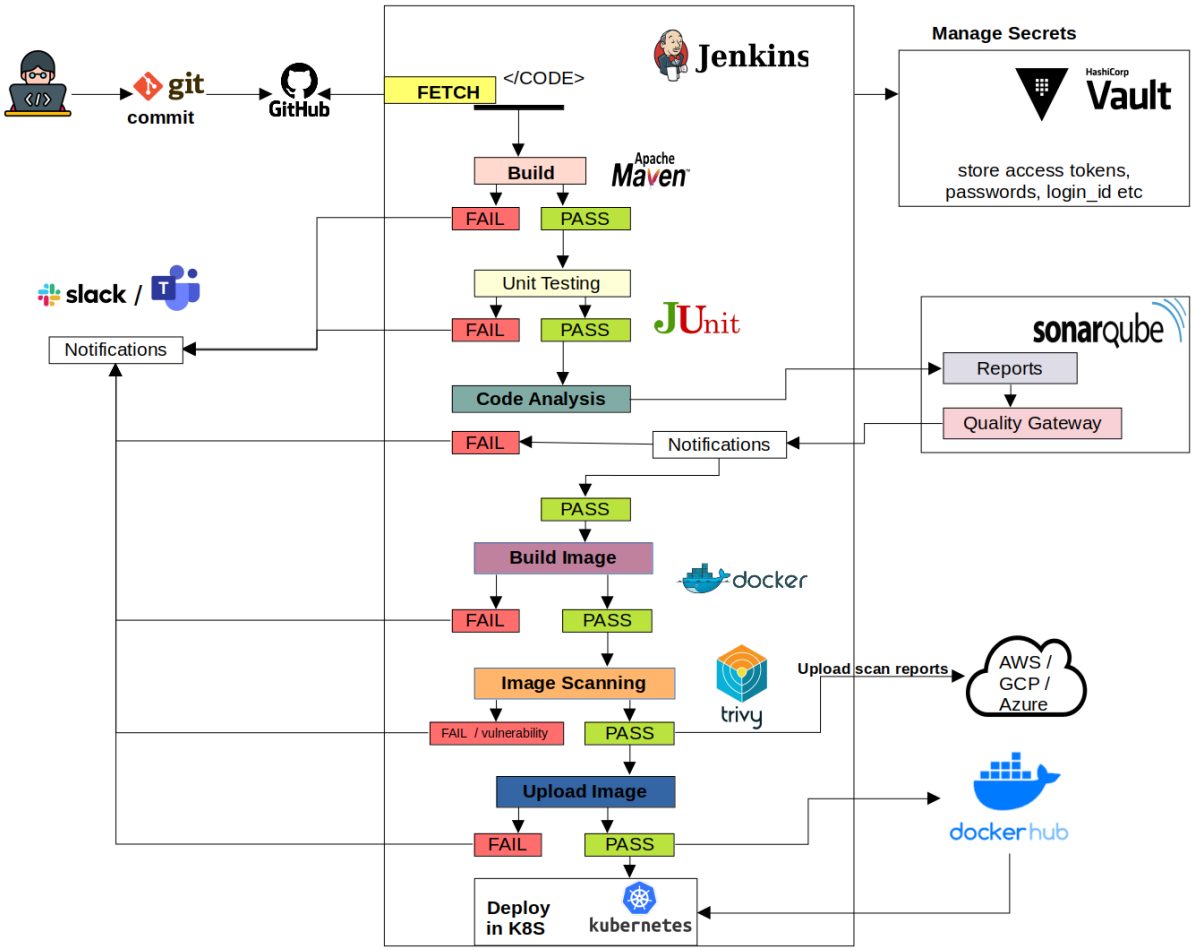
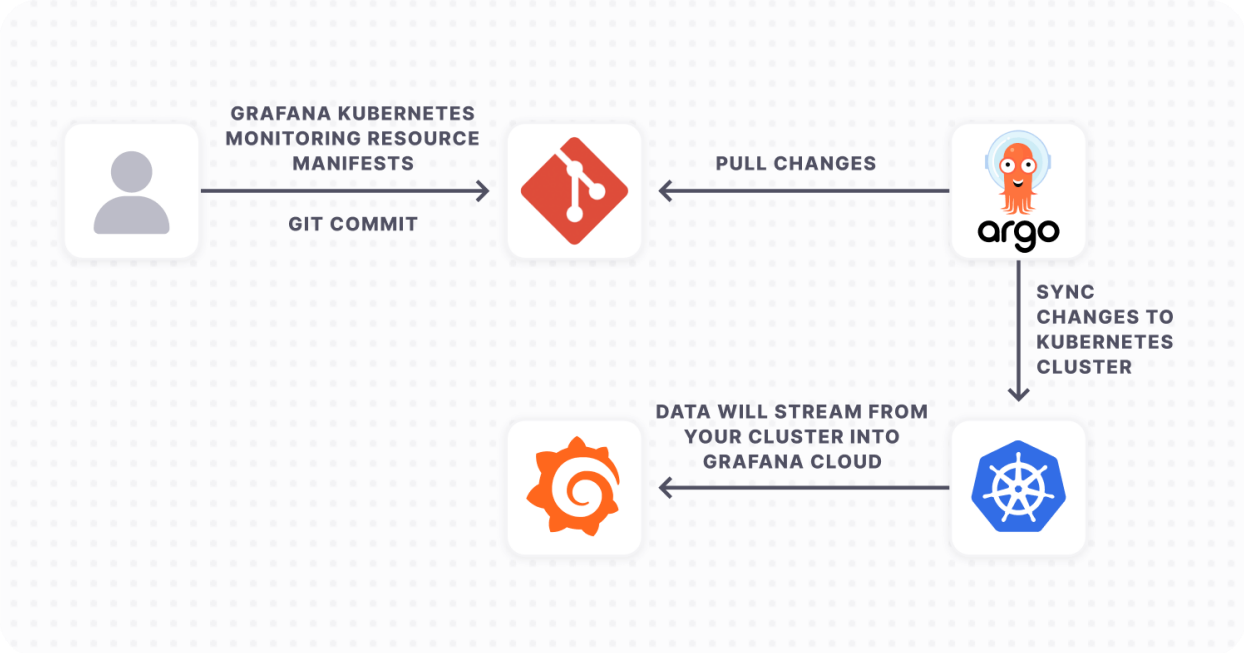
"Comprehensive CI/CD Pipeline with Jenkins, Maven, SonarQube, Nexus, Trivy, ArgoCD, Prometheus, and Grafana"





A CI/CD pipeline is a set of automated processes that are used to build, test, and deploy software applications. The pipeline is designed to streamline the process of software development by automating many of the repetitive tasks that are required to build, test, and deploy applications.A typical CI/CD pipeline includes several stages, including code compilation, testing, and deployment.

Tools Used in the Project

1. Github for version control(Private Reposistory)
2. Docker for containerization
3. SonarQube for code analysis
4. Jenkins for automation
5. Maven for building projects
6. Nexus for artifact management
7. Promethus and Grafana for monitoring
8. Deploy in kubernetes

Pipeline Flow

1. Jenkins will fetch the code from the remote repo

2. Maven will build the code, if the build fails, the whole pipeline will become a failure and Jenkins will notify the user, If build success then

3. SonarQube scanner will scan the code and will send the report to the SonarQube server, where the report will go through the quality gate and gives the output to the web Dashboard. In the quality gate, we define conditions or rules like how many bugs or vulnerabilities, or code smells should be present in the code. Also, we have to create a webhook to send the status of quality gate status to Jenkins. If the quality gate status becomes a failure, the whole pipeline will become a failure then Jenkins will notify the user that your build fails.

4.After the quality gate passes, Docker will build the docker image. if the docker build fails when the whole pipeline will become a failure and Jenkins will notify the user that your build fails.

5.Trivy will scan the docker image, if it finds any Vulnerability then the whole pipeline will become a failure, and the generated report will be sent to s3 for future review and Jenkins will notify the user that your build fails.

6.After trivy scan docker images will be pushed to the docker hub, if the docker fails to push docker images to the docker hub then the pipeline will become a failure and Jenkins will notify the user that your build fails.

7.After the docker push, Jenkins will create deployment and service in minikube and our application will be deployed into Kubernetes. if Jenkins fails to create deployment and service in Kubernetes, the whole pipeline will become a failure and Jenkins will notify the user that your build fails.

8. ArgoCD will manage the continuous delivery of the application by monitoring the Kubernetes manifests and keeping the application synchronized with the desired state.If ArgoCD fails to sync or deploy the application, the pipeline will become a failure, and Jenkins will notify the user.

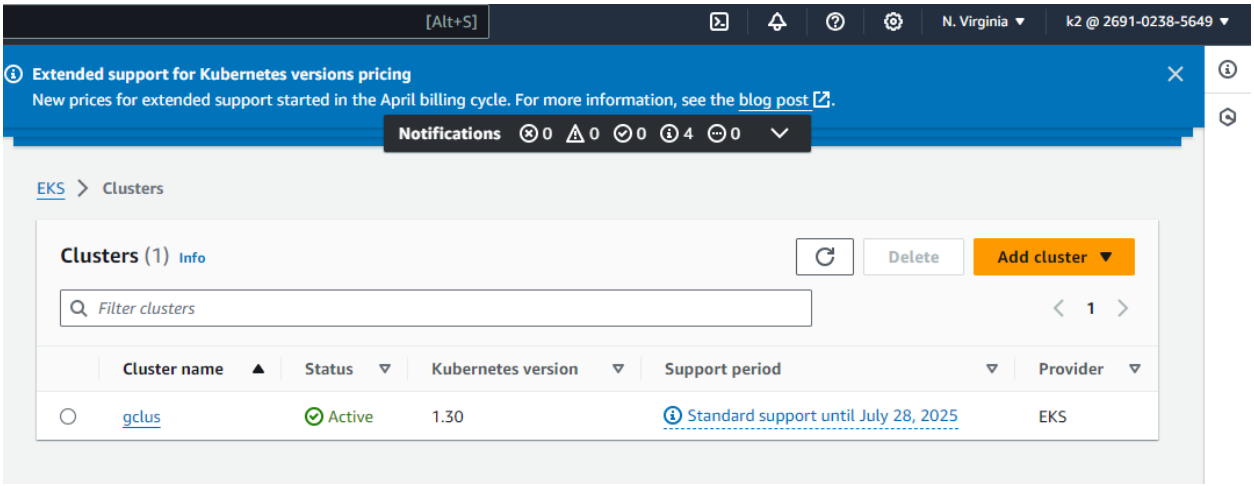
9.Prometheus will collect metrics from the application and Kubernetes cluster.Grafana will visualize these metrics on dashboard

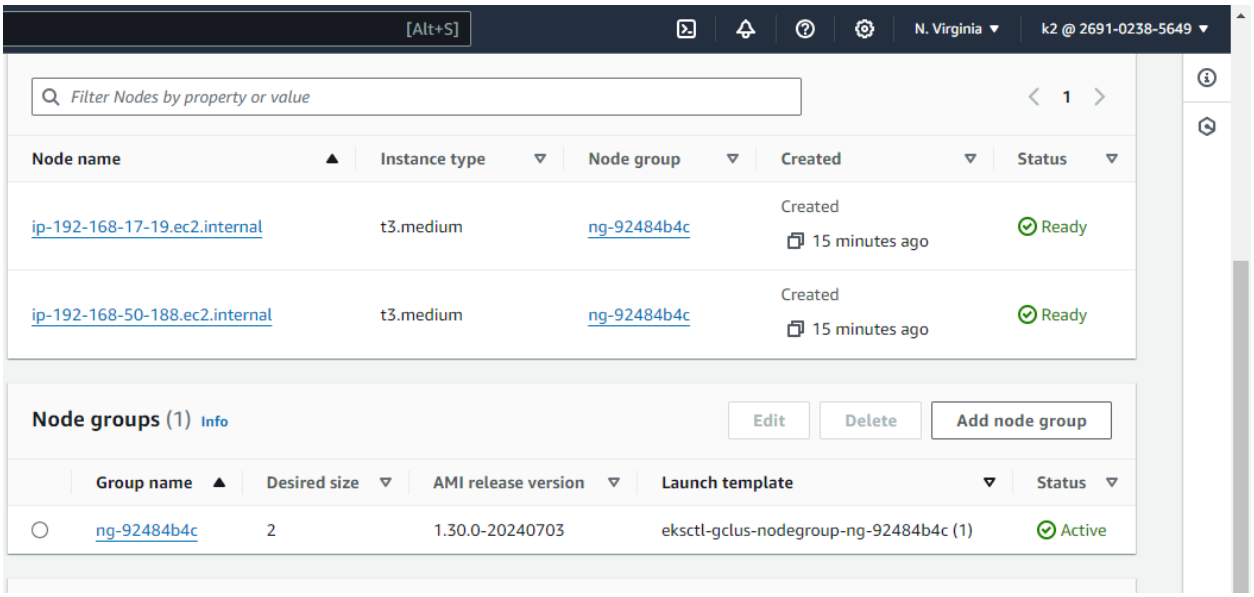
10.At each stage the privacy,security is being maintained

STAGE-1:Installation set-up

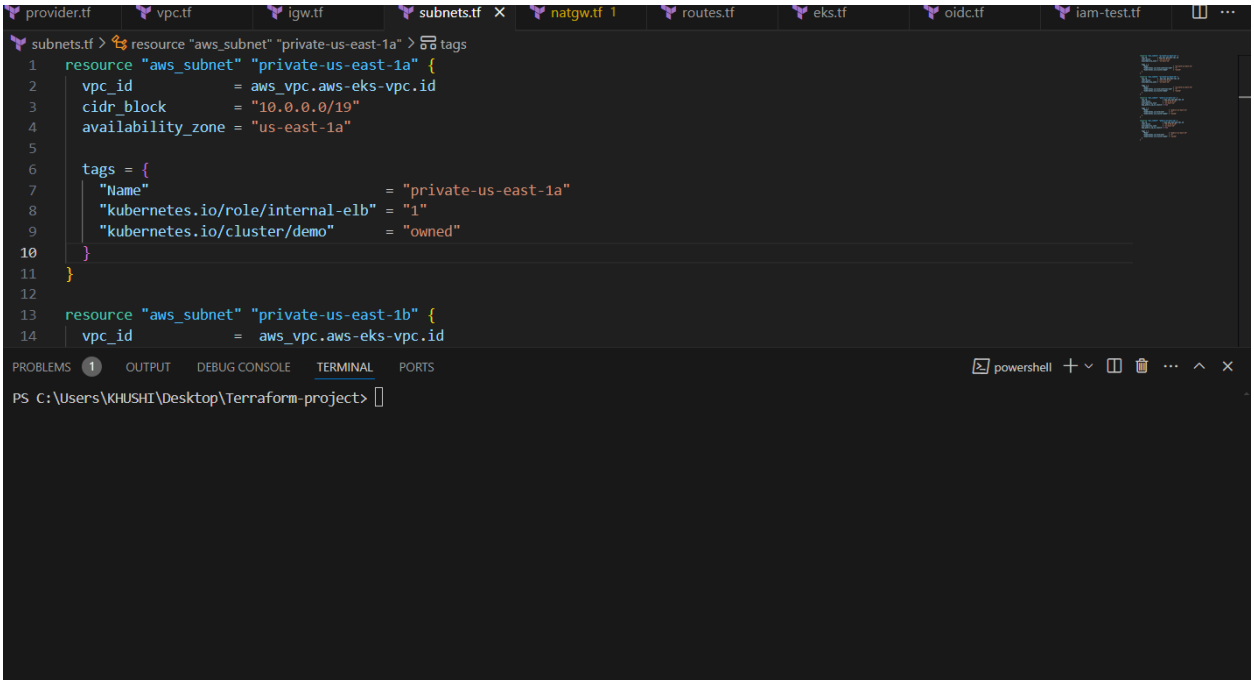
->Creationof EKS cluster

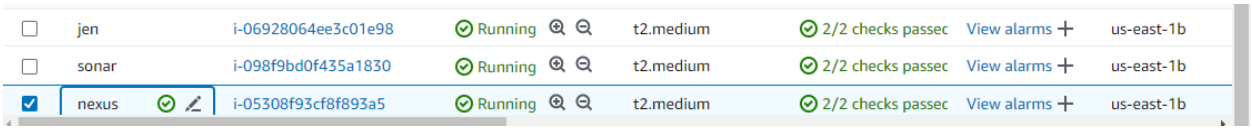
```
PS C:\WINDOWS\system32> eksctl create cluster --name gclus --version 1.30 --node-type t3.medium --nodes 2 --managed -
g-access
2024-07-16 15:15:17 [ℹ]  eksctl version 0.183.0
2024-07-16 15:15:17 [ℹ]  using region us-east-1
2024-07-16 15:15:20 [ℹ]  skipping us-east-1e from selection because it doesn't support the following instance type(s)
t.medium
2024-07-16 15:15:20 [ℹ]  setting availability zones to [us-east-1b us-east-1c]
2024-07-16 15:15:20 [ℹ]  subnets for us-east-1b - public:192.168.0.0/19 private:192.168.64.0/19
2024-07-16 15:15:20 [ℹ]  subnets for us-east-1c - public:192.168.32.0/19 private:192.168.96.0/19
2024-07-16 15:15:20 [ℹ]  nodegroup "ng-92484b4c" will use "" [AmazonLinux2/1.30]
```



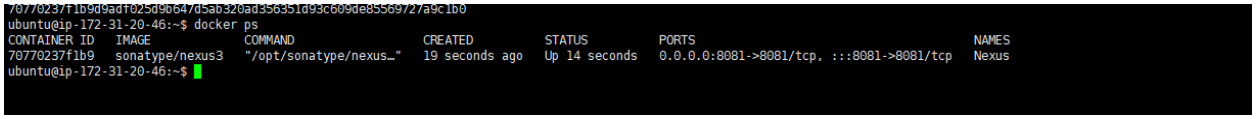


->Launching the instance using Terraform to keep up the industry standard





->Installation of sonarqube on the server

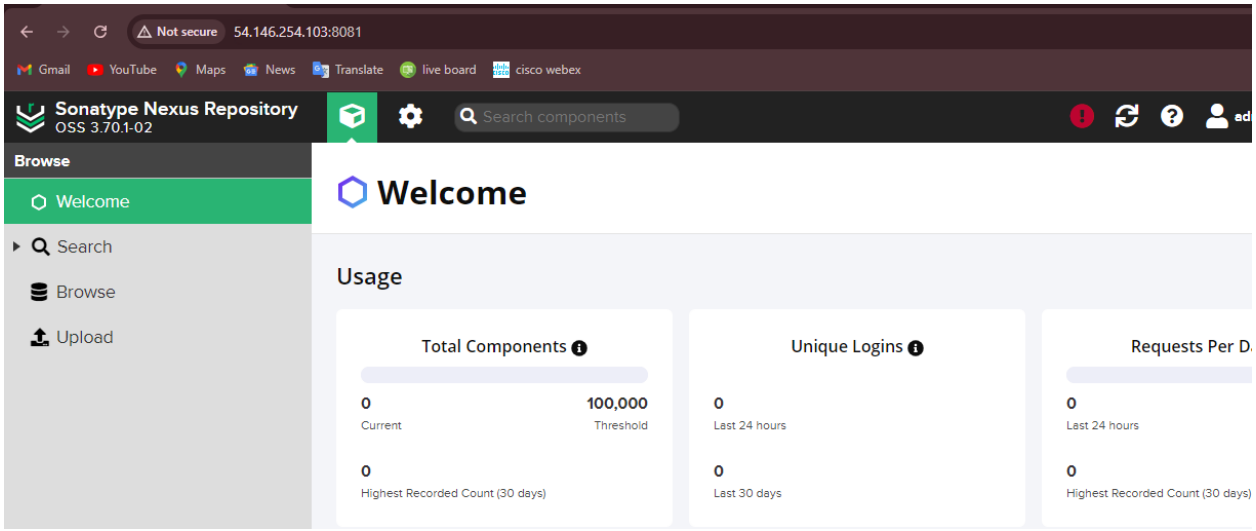


->Installation of Nexus on the server

```
ubuntu@ip-172-31-20-46:~$ docker ps
CONTAINER ID   IMAGE             COMMAND                  CREATED          STATUS          PORTS                                                NAMES
70770237f1b9   sonatype/nexus3   "/opt/sonatype/nexus…"   19 seconds ago   Up 14 seconds   0.0.0.0:8081->8081/tcp, :::8081->8081/tcp   Nexus
ubuntu@ip-172-31-20-46:~$ docker exec -it 70770237f1b9  /bin/bash
bash-4.4$ ls
nexus  sonatype-work  start-nexus-repository-manager.sh
bash-4.4$ cd sonatype-work
bash-4.4$ ls
nexus3
bash-4.4$ cd nexus3
bash-4.4$ ls
admin.password  blobs  cache  db  elasticsearch  etc  generated-bundles  instances  javaprefs  karaf.pid  keystores  lock  log  orient  port  restore-from-backup  tmp
bash-4.4$ cat admin.password
5e6e5b8c-507e-4e45-8987-397ff0b964b8bash-4.4$
```

->UI of Nexus repository

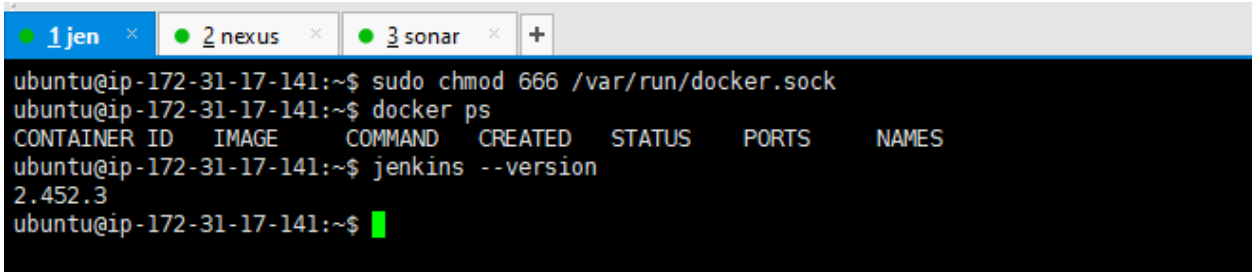
Nexus Repository is a repository manager used to store, organize, and distribute software components and artifacts. It acts as a central hub for managing all kinds of artifacts required in the development process, including binaries, libraries, containers, and other packages.



->UI of sonarqube

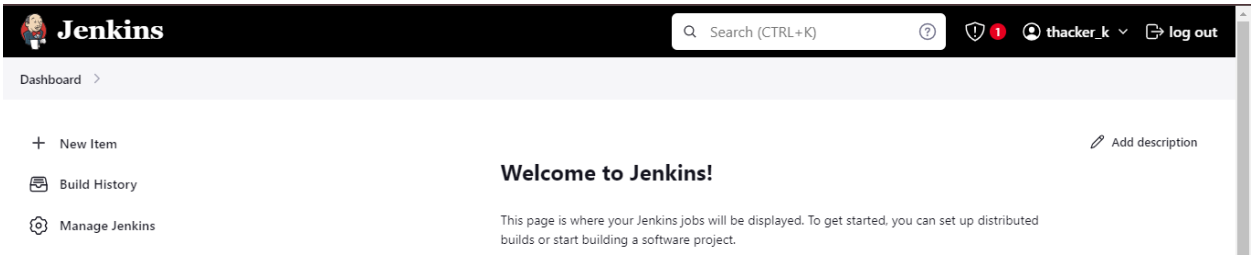
SonarQube is a powerful tool used for continuous inspection of code quality. It helps in ensuring that code meets defined standards and is free of bugs and vulnerabilities.

->Installation of Jenkins on the server



->UI of Jenkins

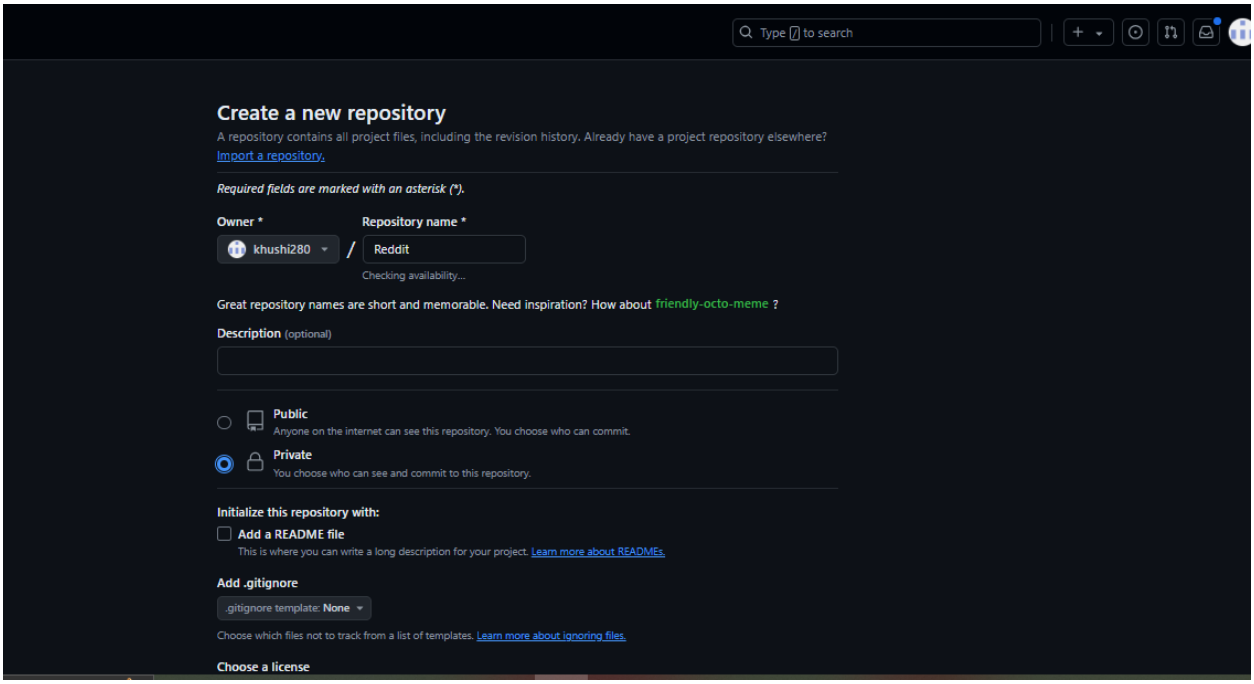
Jenkins is an open-source automation server used extensively for continuous integration and continuous delivery (CI/CD). It helps automate the parts of software development related to building, testing, and deploying, facilitating continuous delivery and integration.



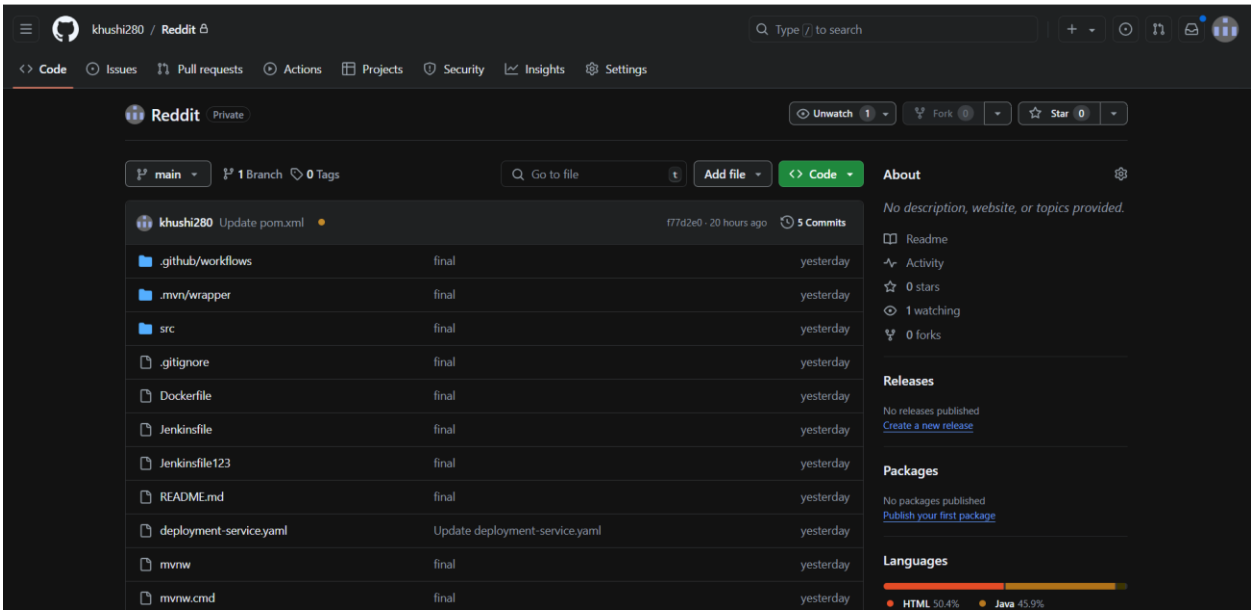
STAGE-2

->Creation of private github repository

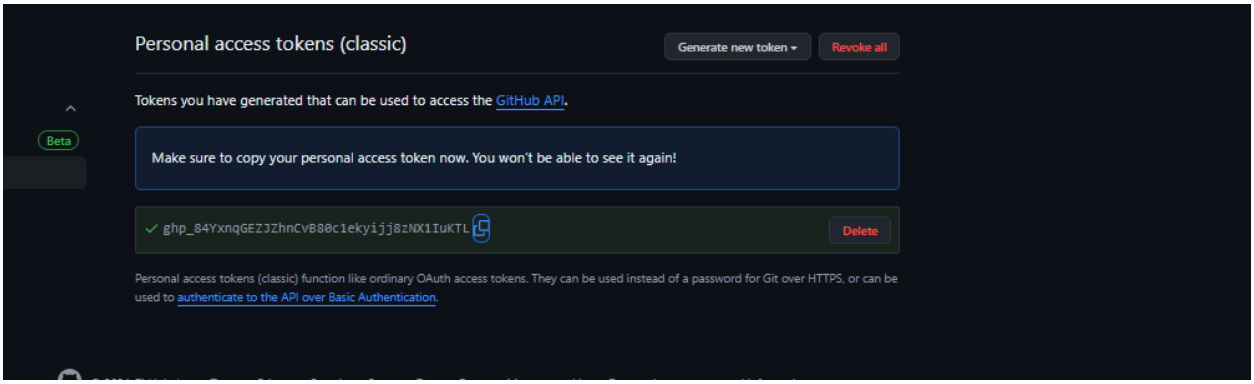
Private repositories on GitHub is created for several important reasons, particularly to ensure security, control, and confidentiality of code and project artifacts



->Pushing the source code in it



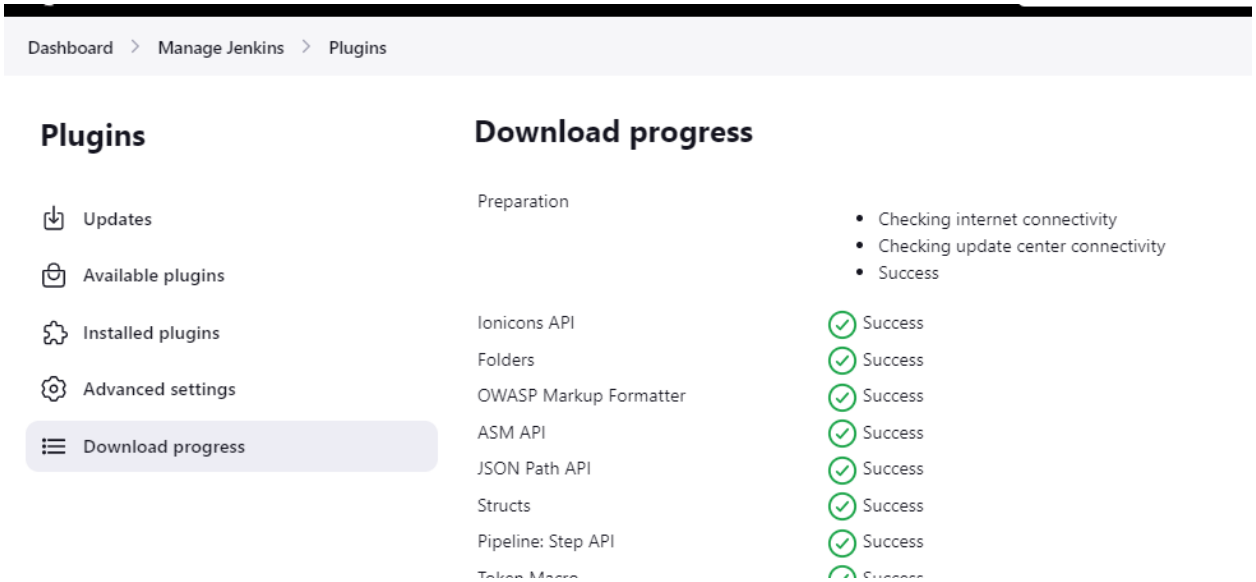
->Access the token



STAGE-3

->Plugins installation

plugins are critical for setting up a robust and efficient CI/CD pipeline. They enable integration with various tools and technologies, automate repetitive tasks, ensure quality and security, and provide monitoring and reporting capabilities. This extensibility and flexibility make Jenkins (and similar CI/CD tools) adaptable to diverse development and deployment workflows. All the necessary plungins have been installed for writing the script.

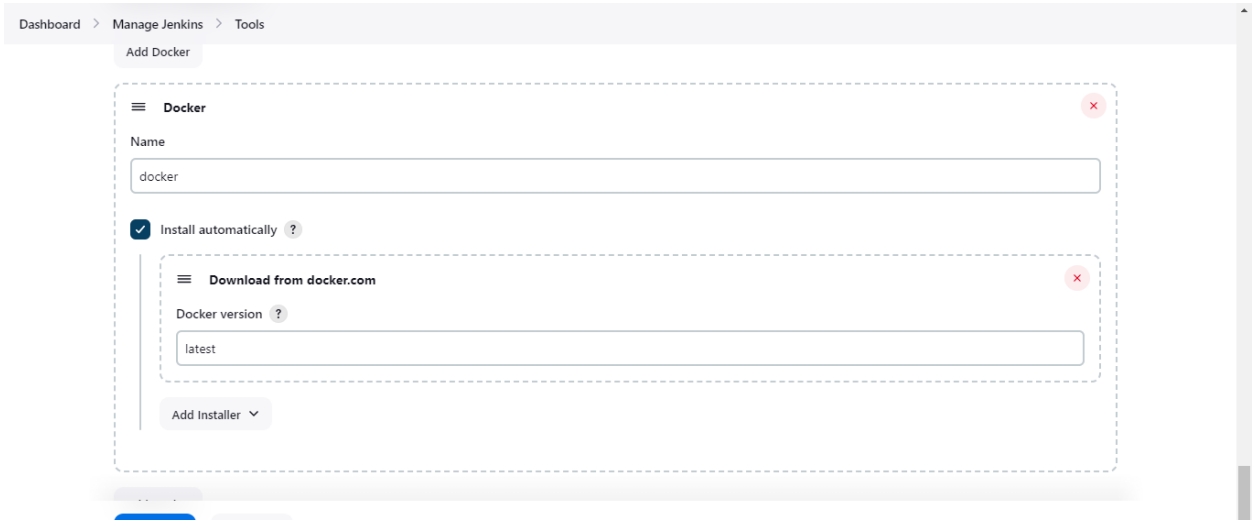


1.Eclipse Temurin Installer:

   - This plugin enables Jenkins to automatically install and configure the Eclipse Temurin JDK (formerly known as AdoptOpenJDK).
2. **Pipeline Maven Integration**:
   - This plugin provides Maven support for Jenkins Pipeline.
   - It allows you to use Maven commands directly within your Jenkins Pipeline scripts..
3. **Config File Provider**:
   - This plugin allows you to define configuration files (e.g., properties, XML, JSON) centrally in Jenkins.
   - These configurations can then be referenced and used by your Jenkins jobs..
4. **SonarQube Scanner**:
   - SonarQube is a code quality and security analysis tool.
   - This plugin integrates Jenkins with SonarQube by providing a scanner that analyzes code during builds.
5. **Kubernetes CLI**:
   - This plugin allows Jenkins to interact with Kubernetes clusters using the Kubernetes command-line tool (`kubectl`).
   - It's useful for tasks like deploying applications to Kubernetes from Jenkins jobs..
6. **Kubernetes**:
   - This plugin integrates Jenkins with Kubernetes by allowing Jenkins agents to run as pods within a Kubernetes cluster.
   - It provides dynamic scaling and resource optimization capabilities for Jenkins builds.
7. **Docker**:
   - This plugin allows Jenkins to interact with Docker, enabling Docker builds and integration with Docker registries.
   - You can use it to build Docker images, run Docker containers, and push/pull images from Docker registries.
8. **Docker Pipeline Step**:
   - This plugin extends Jenkins Pipeline with steps to build, publish, and run Docker containers as part of your Pipeline scripts.
   - It provides a convenient way to manage Docker containers directly from Jenkins Pipelines.

->Configuring tools

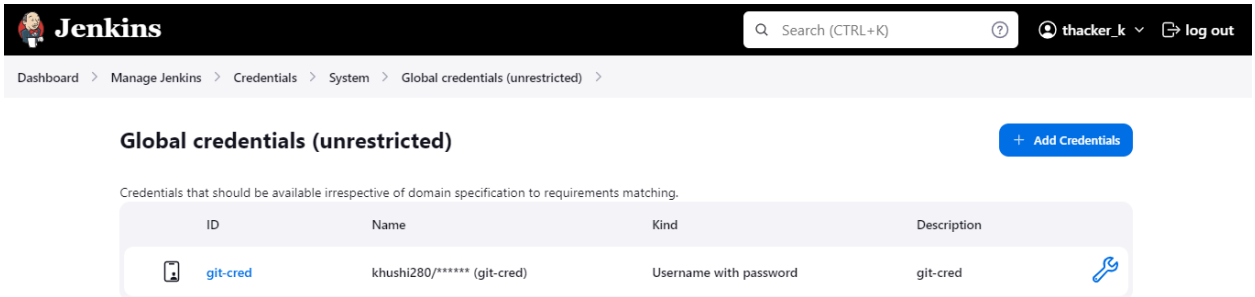
Configuring tools in Jenkins enhances automation, integration, quality assurance, artifact management, containerization, monitoring, environment management, security, scalability, and project management within the CI/CD pipeline. This results in a more efficient, reliable, and scalable software development and deployment process.



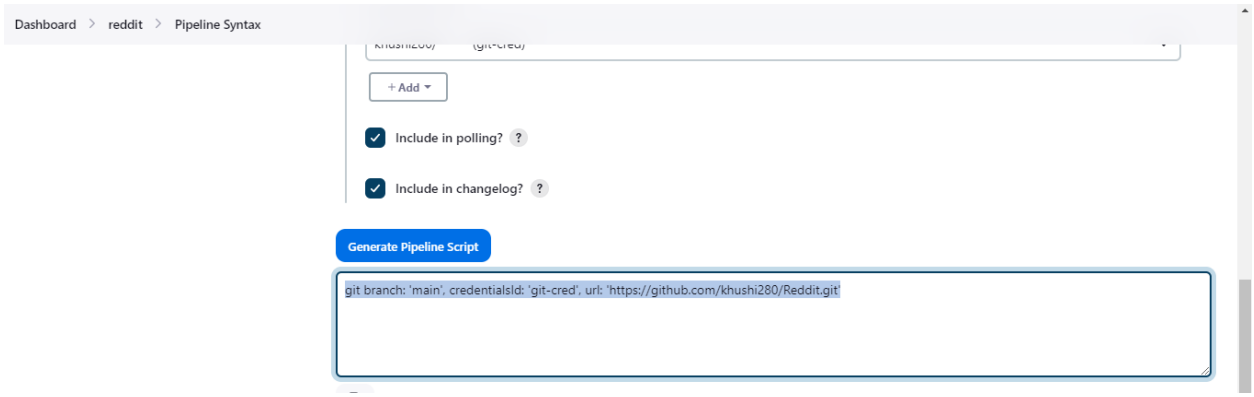
-> Creating and managing credentials at each step of a CI/CD pipeline in tools like Jenkins is critical for securely integrating with external systems, adhering to security best practices, automating workflows efficiently, ensuring compliance, and maintaining the overall security posture of the software development and deployment processes. At each step the credentials is geing created

```
stages {
        stage('Git Checkout') {
            steps {
               git branch: 'main', credentialsId: 'git-cred', url:
'https://github.com/khushi280/reddit.git'
            }
        }
```

This stage is geing created for connecting to the github



Each step of the pipeline has been configured using the pipeline syntax

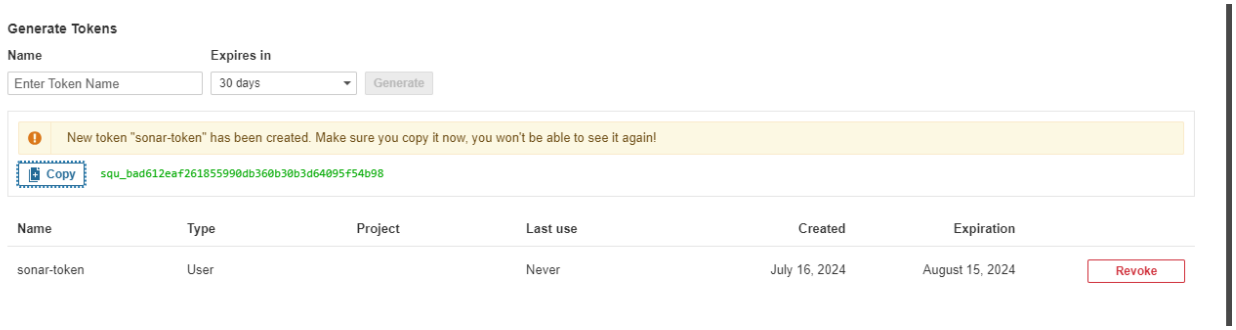


-> Trivy is installed in CI/CD pipelines to enhance container security by automating vulnerability scanning, ensuring compliance with security policies, mitigating risks, and supporting DevSecOps practices that prioritize security throughout the software development lifecycle.

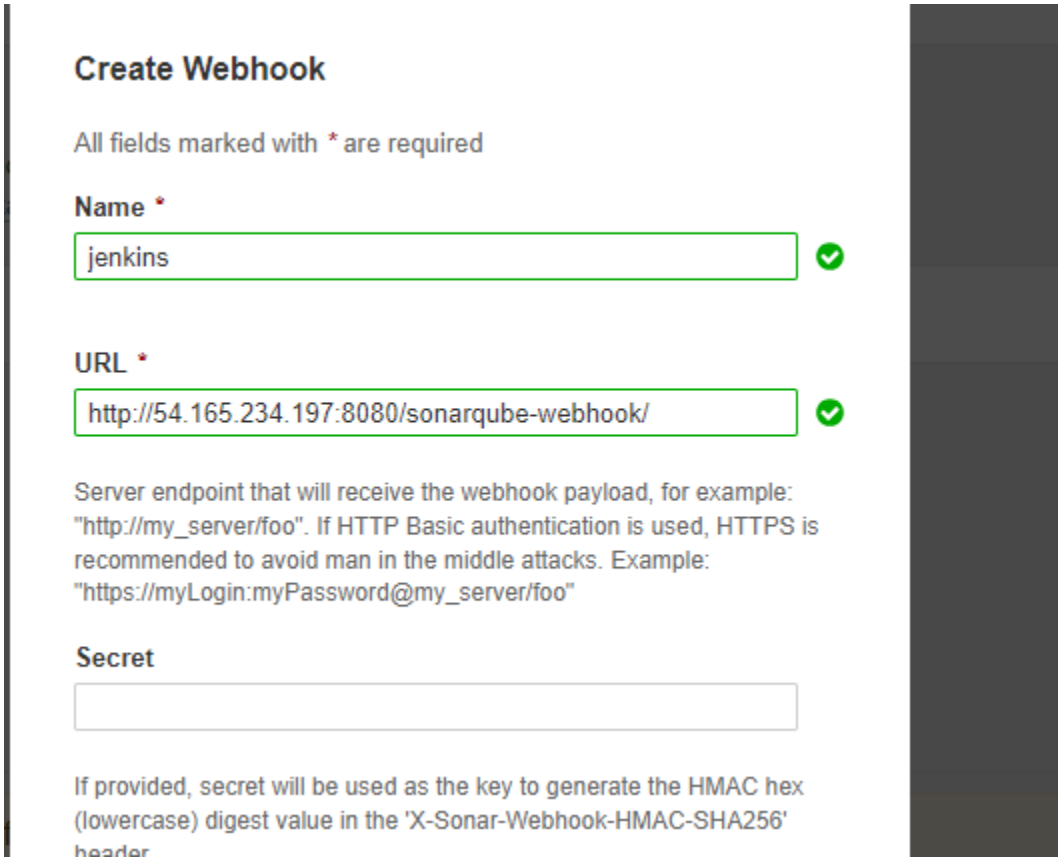
```
stage('Trivy scanning') {
            steps {
                sh "trivy fs --format table -o trivy-fs-report.html ."
            }
        }
```

This has been created to generate the trivy reports for analysis

```
stage('SonarQube Analsyis') {
            steps {
                withSonarQubeEnv('sonar') {
                    sh ''' $SCANNER_HOME/bin/sonar-scanner -
Dsonar.projectName=reddit -Dsonar.projectKey=reddit \
                           -Dsonar.java.binaries=. '''
                }
            }
        }
```

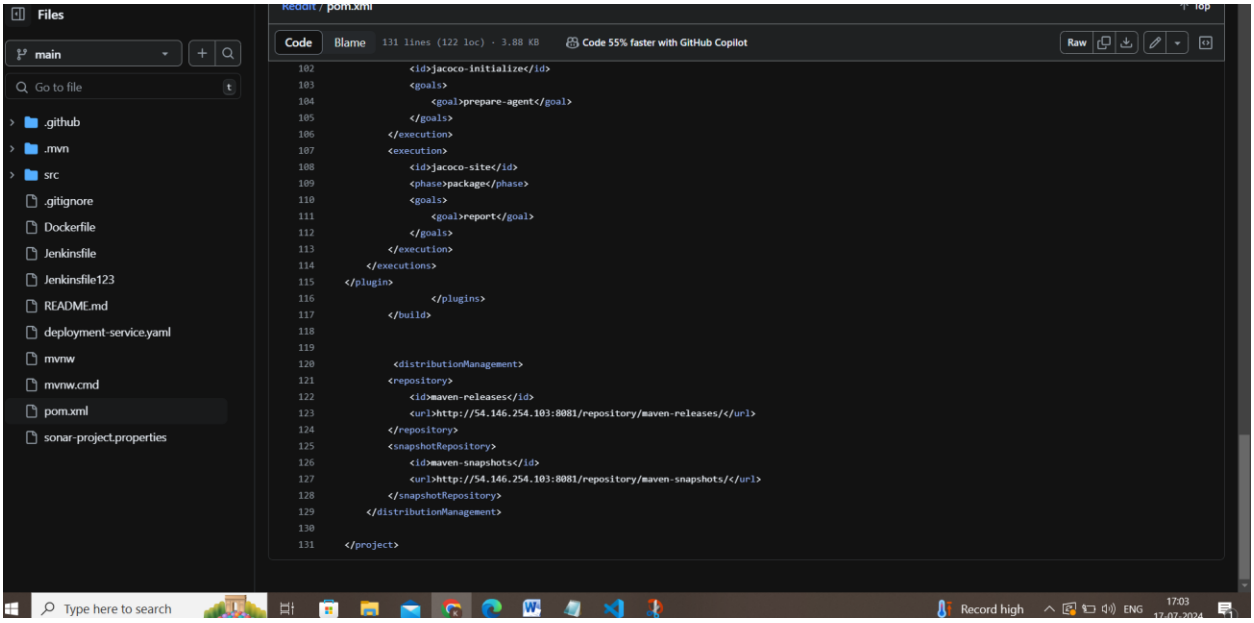


The sonarqube token has been generated after that configuration of the webhook has been done.



-> Deploys artifacts to Nexus repository using Maven, with global Maven settings configured (`global-settings`).and configured the pom.xml file

```
stage('Nexus deployment') {
            steps {
               withMaven(globalMavenSettingsConfig: 'global-settings', jdk:
'jdk17', maven: 'maven3', mavenSettingsConfig: '', traceability: true) {
                   sh "mvn deploy"
                }
```



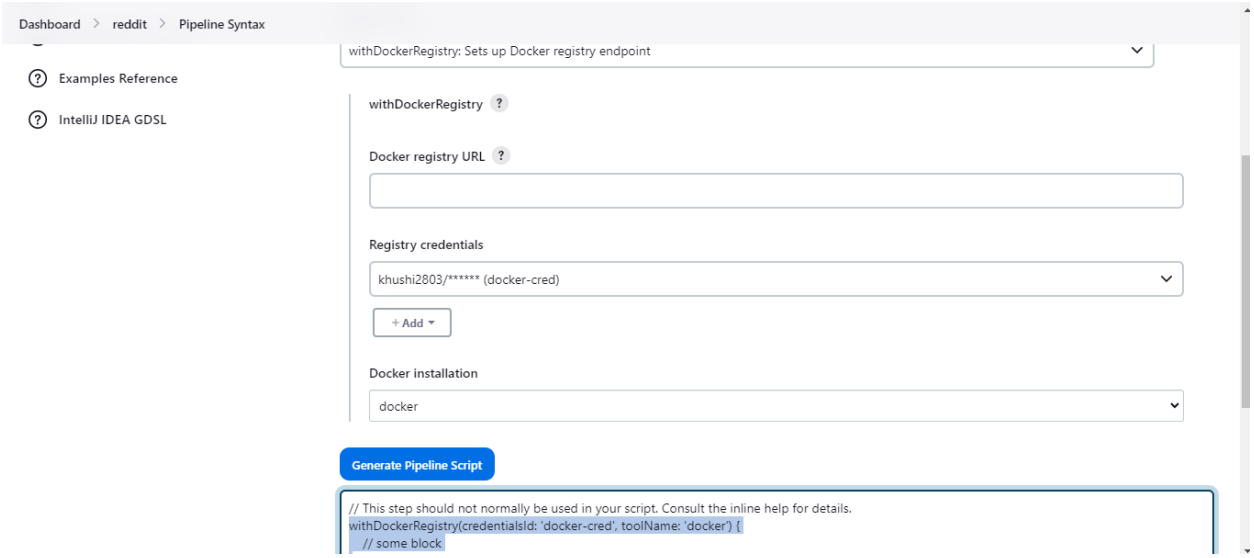
->Builds a Docker image (`docker build`), using Docker credentials (`docker-cred`).

-> **Docker Image Scan**:

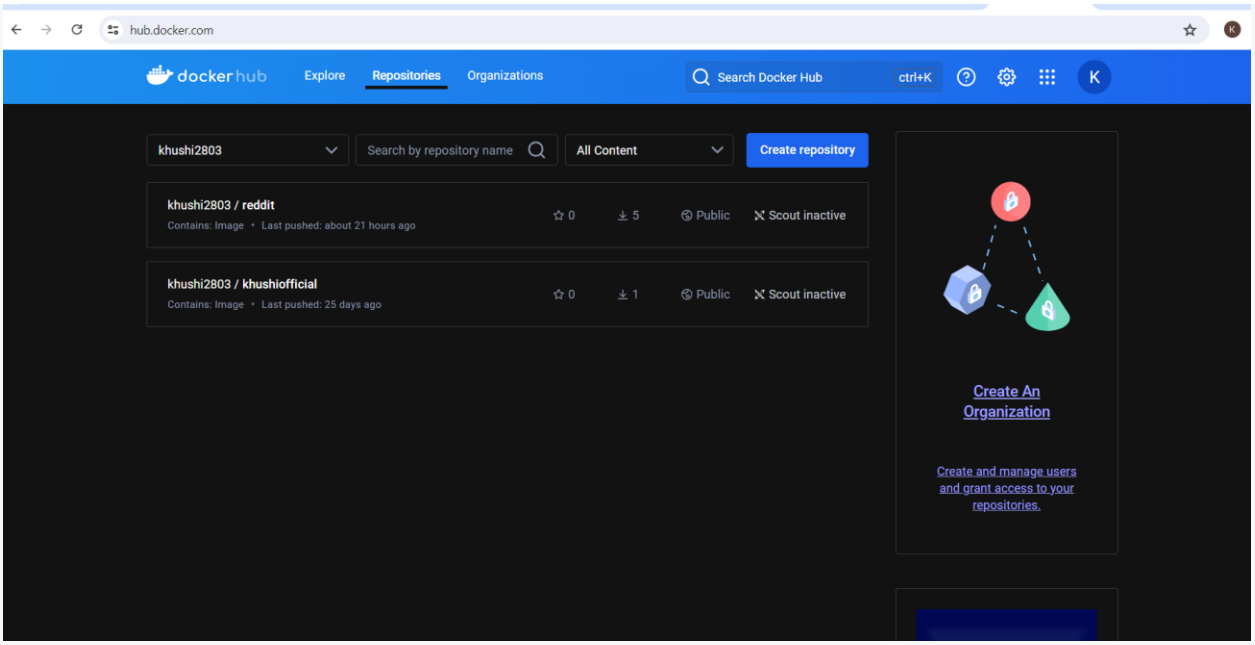
- Uses Trivy to scan the Docker) for vulnerabilities and generates a report (`trivy-image-report.html`).

-> **Push Docker Image**:

- Pushes the Docker image (`docker push`) to a Docker registry using Docker credentials (`docker-cred`).




```
stage('Build & Tag Docker Image') {
            steps {
               script {
                   withDockerRegistry(credentialsId: 'docker-cred', toolName:
'docker') {
                            sh "docker build -t."
                    }
                }
            }
        }

        stage('Docker Image Scan') {
            steps {
                sh "trivy image --format table -o trivy-image-report.html "
            }
        }

        stage('Push Docker Image') {
            steps {
               script {
                   withDockerRegistry(credentialsId: 'docker-cred', toolName:
'docker') {
                            sh "docker push "
                    }
                }
            }
        }
```



Docker-hub repository

sec.yaml

```yaml
apiVersion: v1
kind: Secret
type: kubernetes.io/service-account-token
metadata:
  name: mysecretname
  annotations:
    kubernetes.io/service-account.name: jenkins

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS powershell

```
spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ kubetctl create ns webapps
+ ~~~~~~~~
    + CategoryInfo          : ObjectNotFound: (kubetctl:String) [], CommandNotFoundException
    + FullyQualifiedErrorId : CommandNotFoundException

PS E:\Devops\Proj_k> kubectl create ns webapps
namespace/webapps created
PS E:\Devops\Proj_k> kubectl apply -f svc.yaml
serviceaccount/jenkins created
PS E:\Devops\Proj_k> kubectl apply -f role.yaml
role.rbac.authorization.k8s.io/app-role created
PS E:\Devops\Proj_k> kubectl apply -f bind.yaml
rolebinding.rbac.authorization.k8s.io/app-rolebinding created
PS E:\Devops\Proj_k> kubectl apply -f sec.yaml -n webapps
The Secret "mysecretname" is invalid: metadata.annotations[kubernetes.io/service-account.name]: Required value
PS E:\Devops\Proj_k> kubectl apply -f sec.yaml -n webapps
secret/mysecretname created
PS E:\Devops\Proj_k>
```

->Deploys the application to Kubernetes (`kubectl apply`) in the `webapps` namespace of the specified Kubernetes cluster (`kubernetes`), using Kubernetes credentials (`k8-cred`)

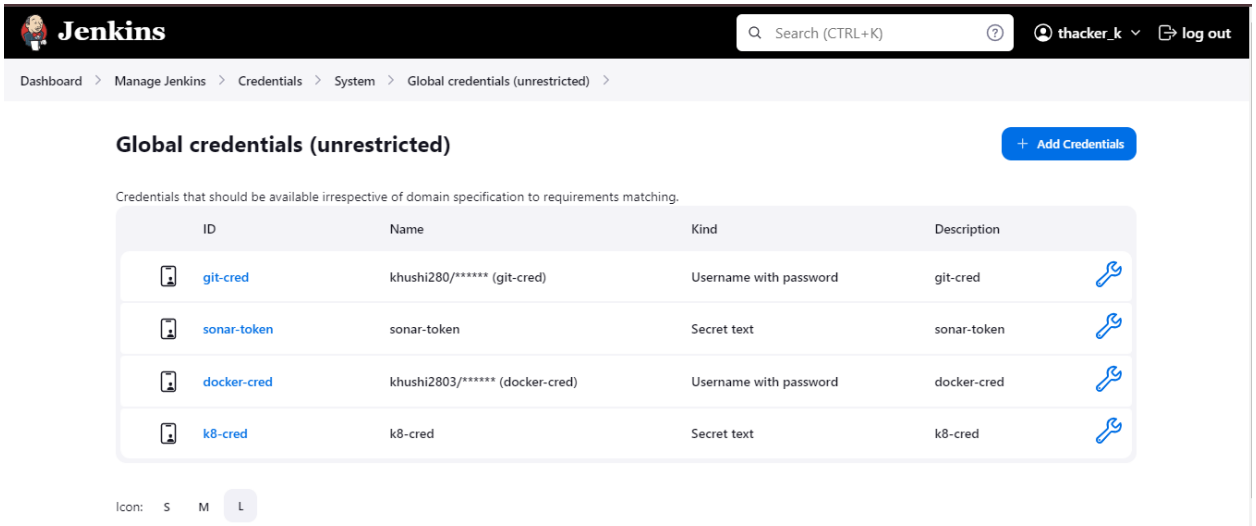
->Verifies the deployment by retrieving and displaying information about pods (`kubectl get pods`) and services (`kubectl get svc`) in the `webapps` namespace.

1 jen 2 nexus 3 sonar

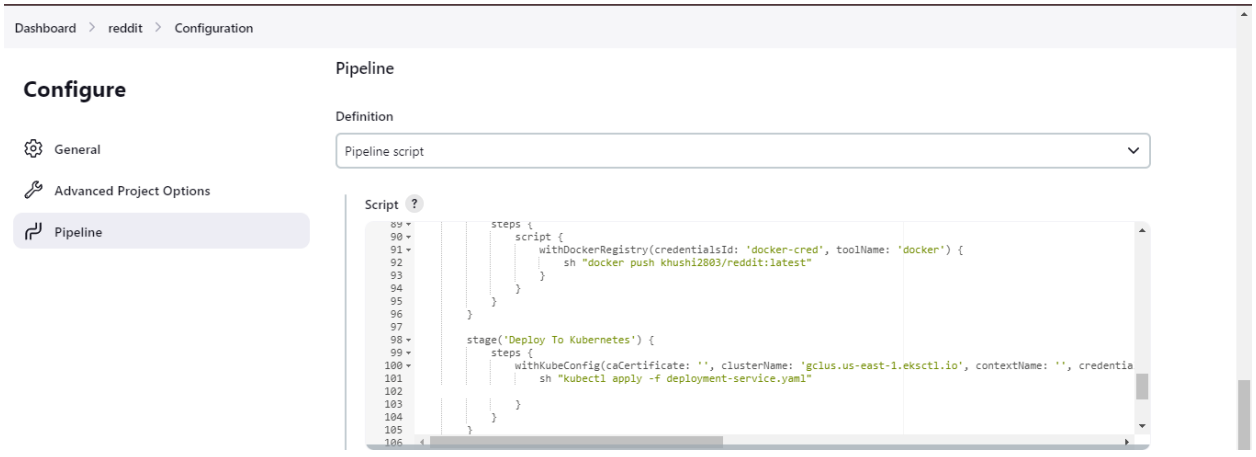
```
ubuntu@ip-172-31-17-141:~$ trivy --version
Version: 0.53.0
ubuntu@ip-172-31-17-141:~$ vi k.sh
ubuntu@ip-172-31-17-141:~$ sudo chmod +x k.sh
ubuntu@ip-172-31-17-141:~$ . /k.sh
-bash: /k.sh: No such file or directory
ubuntu@ip-172-31-17-141:~$ ./k.sh
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 57.4M  100 57.4M    0     0  19.0M      0  0:00:03  0:00:03 --:--:-- 19.0M
Client Version: v1.19.6-eks-49a6c0
ubuntu@ip-172-31-17-141:~$
```

```
stage('Deploy To Kubernetes') {
            steps {
               withKubeConfig(caCertificate: '', clusterName: '',
contextName: '', credentialsId: 'k8-cred', namespace: 'webapps',
restrictKubeConfigAccess: false, serverUrl: 'https://172.31.8.146:6443') {
                        sh "kubectl apply -f deployment-service.yaml"
                }
            }
        }
```

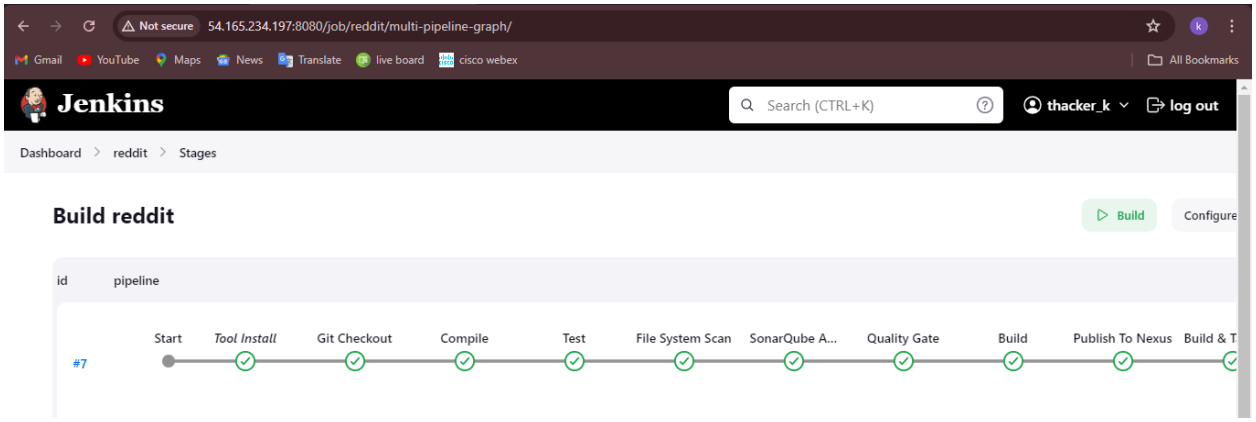
->The complete pipeline has been set-up with all the crediantials .

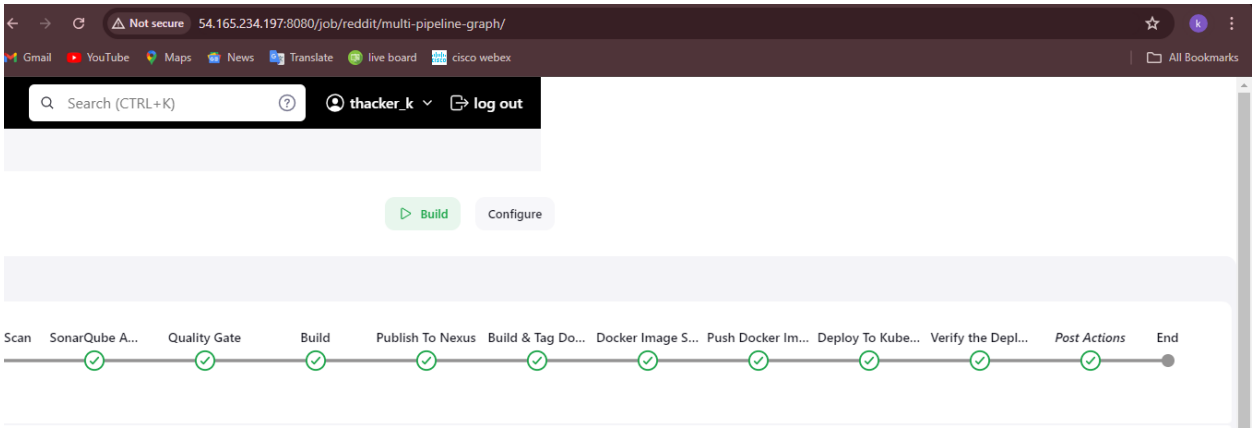


->The complete script has been configured



->Successful building of the whole ci-cd pipeline with all the stages





- **Success**: The pipeline successfully executed all stages from code checkout to deployment, ensuring that the application was built, tested, analyzed for security vulnerabilities, packaged into Docker containers, deployed to Kubernetes, and verified for functionality.

- **Failure**: The pipeline halts if any stage fails (e.g., test failures, security vulnerabilities exceeding thresholds, deployment issues), notifying stakeholders via email and providing details for troubleshooting.

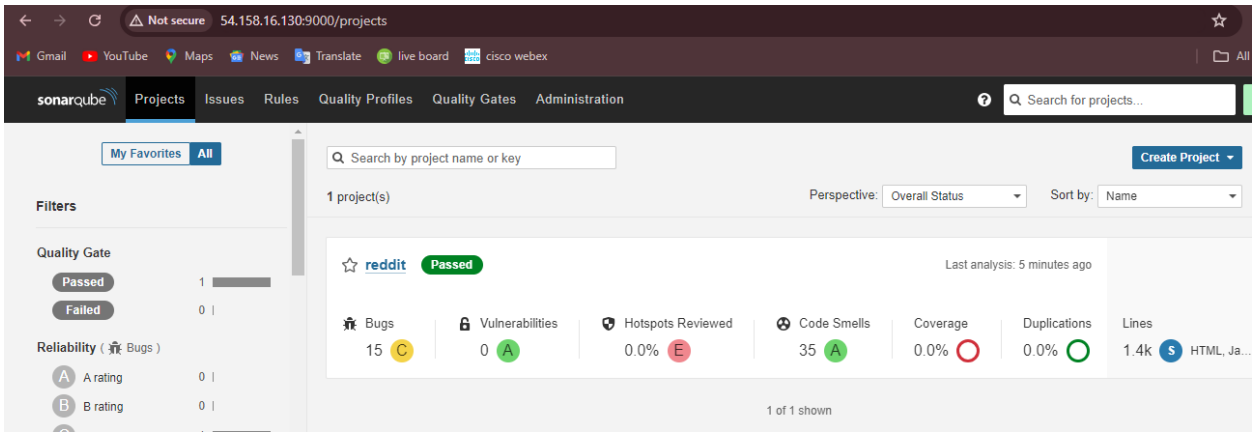
1. **Git Checkout**:
    - **Result**: Successfully fetched the latest code from the Git repository.
2. **Compile**:
    - **Result**: Compilation completed successfully without errors.
3. **Test**:
    - **Result**: Unit tests executed and passed, indicating basic functionality is intact.
4. **File System Scan (Trivy)**:

- **Result**: Identified vulnerabilities in local dependencies and filesystem, if any, reported in `trivy-fs-report.html`.

5. **SonarQube Analysis**:
   - **Result**: Analyzed code quality metrics and potential issues such as bugs, vulnerabilities, and code smells. Quality Gate status determined the next steps.
6. **Quality Gate**:
   - **Result**: Pipeline continued or halted based on SonarQube Quality Gate status. Passed if code met quality criteria; failed otherwise.
7. **Build (Maven Package)**:
   - **Result**: Packaged the application artifacts (e.g., JAR files) successfully.
8. **Publish To Nexus**:
   - **Result**: Deployed artifacts to Nexus repository manager for version control and distribution.
9. **Build & Tag Docker Image**:
   - **Result**: Built Docker image containing the application.
10. **Docker Image Scan (Trivy)**:
    - **Result**: Scanned Docker image for vulnerabilities, producing `trivy-image-report.html` with findings.
11. **Push Docker Image**:
    - **Result**: Pushed Docker image to the Docker registry for deployment.
12. **Deploy To Kubernetes**:
    - **Result**: Deployed application to Kubernetes cluster in the `webapps` namespace using `deployment-service.yaml`.
13. **Verify the Deployment**:
    - **Result**: Confirmed successful deployment by checking pods (`kubectl get pods -n webapps`) and services (`kubectl get svc -n webapps`) in Kubernetes.

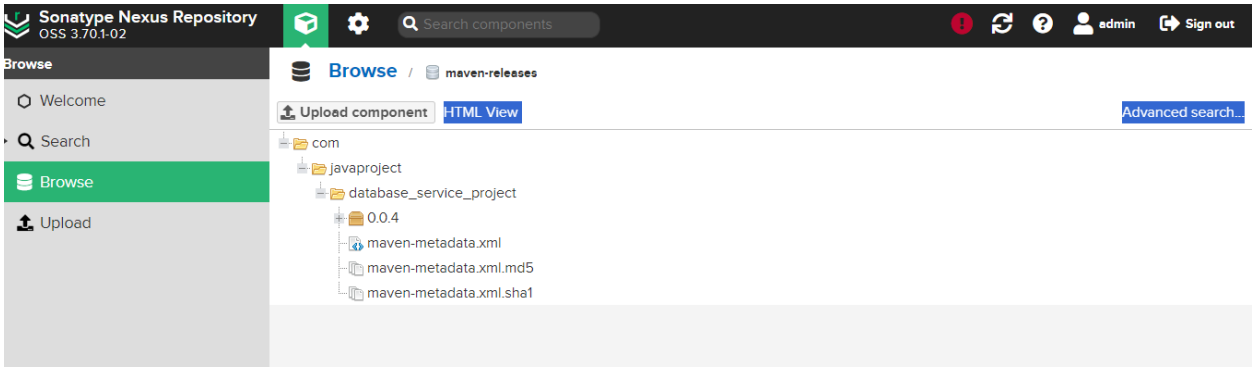
->The results analysis of the whole pipeline

Sonarqube quality test has been passed

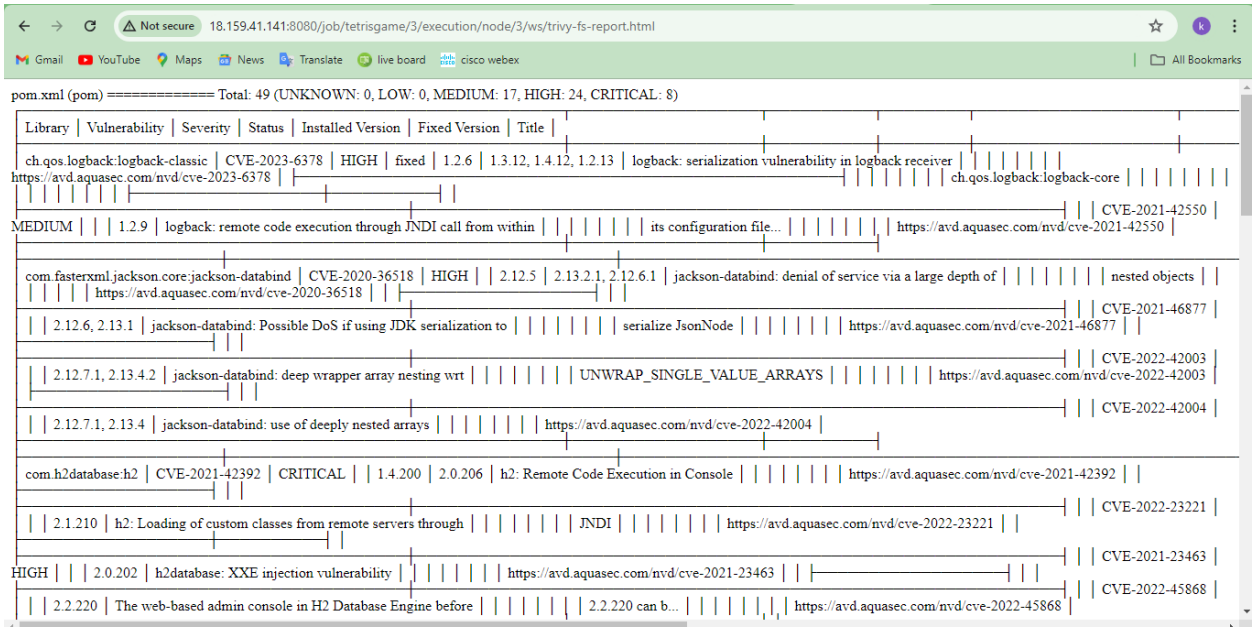


->The artficats has been formed

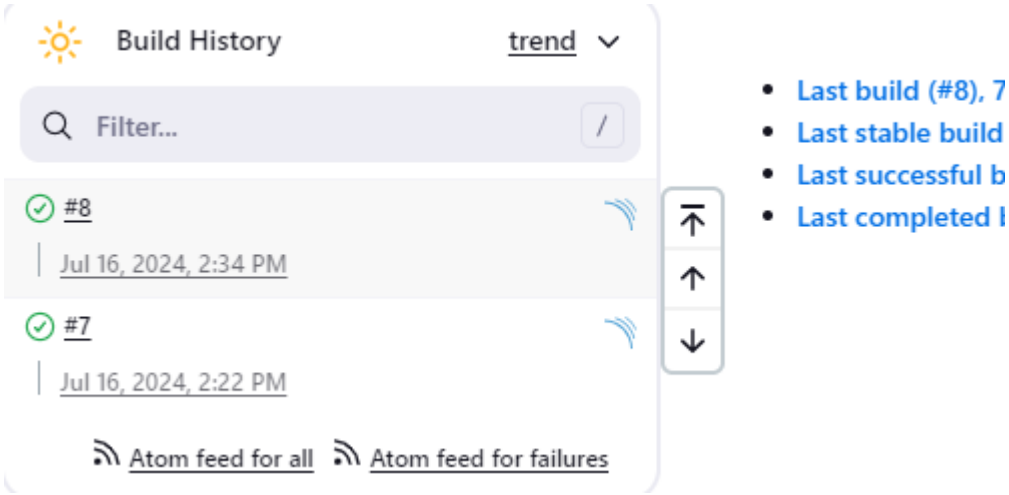
->The nexus repository has been configured



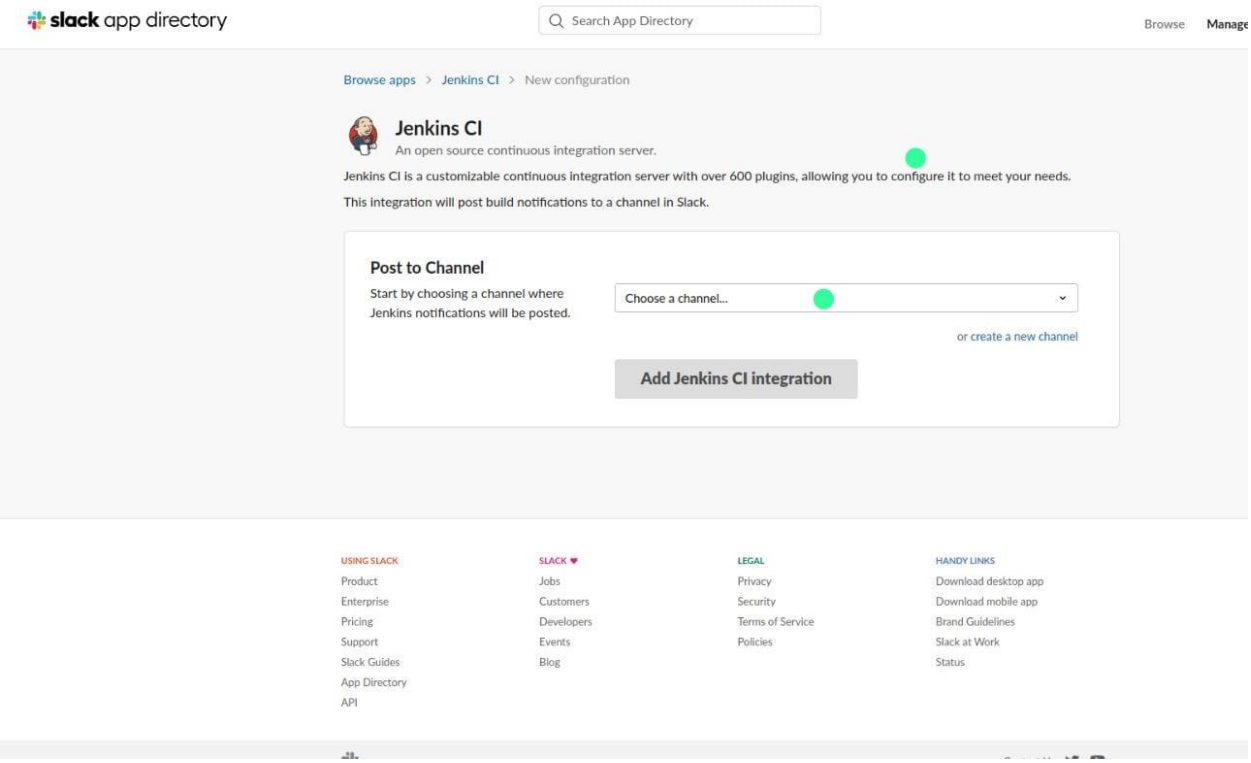
->The Trivy report has been generated



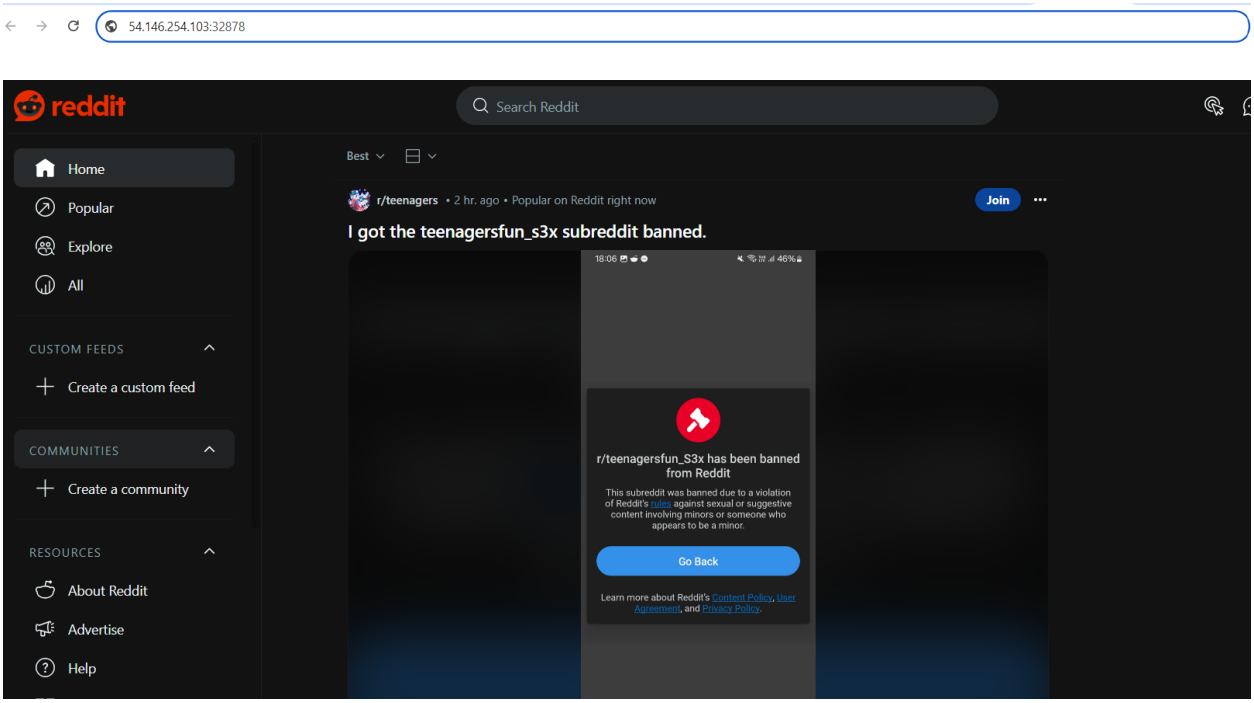
->The complete build history of the pipeline



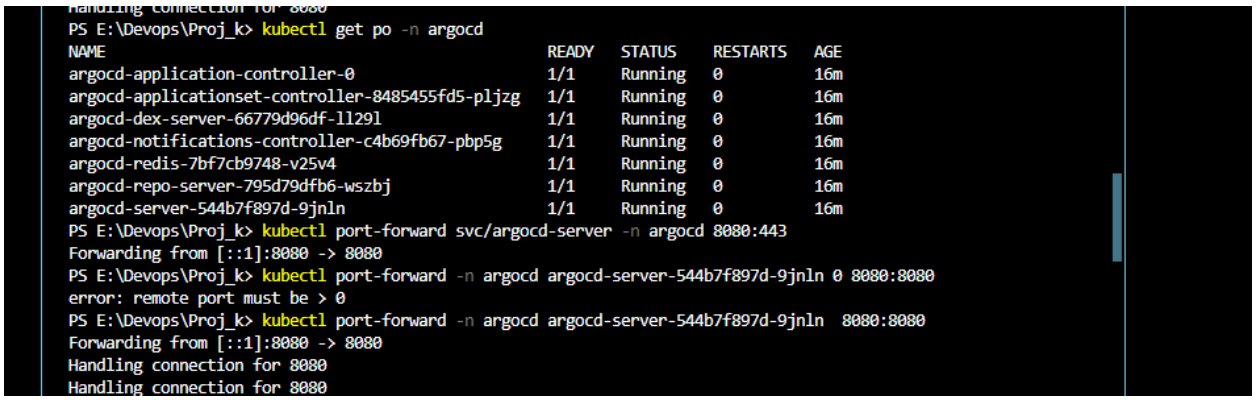
->Slack notification



->The application has been deployed and the pods are running



ArgoCD streamlines and automates Kubernetes deployments through GitOps principles, providing robust capabilities for managing application lifecycles, ensuring consistency, scalability, security, and visibility across Kubernetes clusters. This makes it a preferred choice for organizations adopting Kubernetes for containerized application orchestration and deployment.Configured the whole argocd pipeline

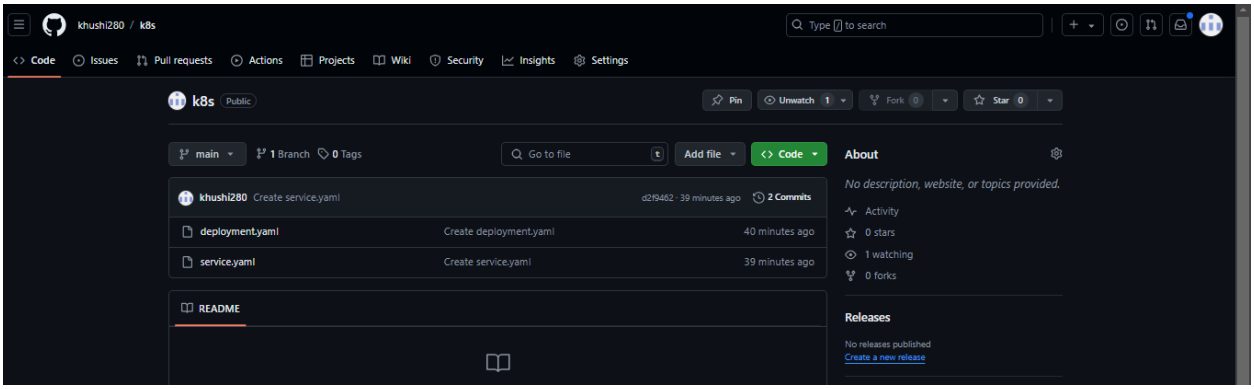


```
PS E:\Devops\Proj_k> kubectl get po -n argocd
NAME                                                READY   STATUS    RESTARTS   AGE
argocd-application-controller-0                     1/1     Running   0          16m
argocd-applicationset-controller-8485455fd5-pljzg   1/1     Running   0          16m
argocd-dex-server-66779d96df-l1291                  1/1     Running   0          16m
argocd-notifications-controller-c4b69fb67-pbp5g     1/1     Running   0          16m
argocd-redis-7bf7cb9748-v25v4                       1/1     Running   0          16m
argocd-repo-server-795d79dfb6-wszbj                 1/1     Running   0          16m
argocd-server-544b7f897d-9jnln                      1/1     Running   0          16m
PS E:\Devops\Proj_k> kubectl port-forward svc/argocd-server -n argocd 8080:443
Forwarding from [::1]:8080 -> 8080
PS E:\Devops\Proj_k> kubectl port-forward -n argocd argocd-server-544b7f897d-9jnln 0 8080:8080
error: remote port must be > 0
PS E:\Devops\Proj_k> kubectl port-forward -n argocd argocd-server-544b7f897d-9jnln  8080:8080
Forwarding from [::1]:8080 -> 8080
Handling connection for 8080
Handling connection for 8080
```

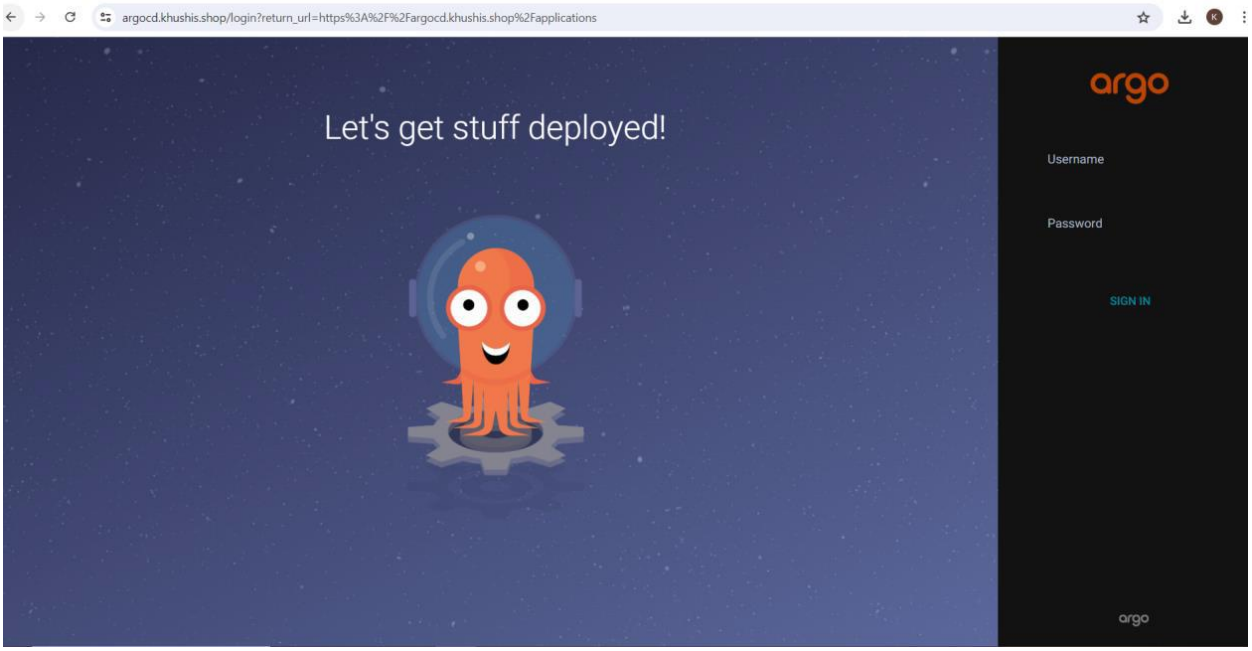
->Installation of the argocd and configuring the argocd application

```
PS E:\Devops\Proj_k> kubectl -n argocd get secret argocd-initial-admin-secret -o jsonpath="{.data.pas
+                                                                                          ~~~~~~~~
    + FullyQualifiedErrorId : CommandNotFoundException

PS E:\Devops\Proj_k> aws configure
AWS Access Key ID [****************XPBV]:
AWS Secret Access Key [****************dU0w]:
Default region name [us-east-1]:
Default output format [table]:
PS E:\Devops\Proj_k> kubectl -n argocd get secret argocd-initial-admin-secret -o jsonpath="{.data.pas
sword}" | base64 -d
base64 : The term 'base64' is not recognized as the name of a cmdlet, function, script file, or
is correct and try again.
At line:1 char:91
+ ... rgocd-initial-admin-secret -o jsonpath="{.data.password}" | base64 -d
+                                                                ~~~~~~~~
    + CategoryInfo          : ObjectNotFound: (base64:String) [], CommandNotFoundException
    + FullyQualifiedErrorId : CommandNotFoundException

PS E:\Devops\Proj_k> $secret = kubectl -n argocd get secret argocd-initial-admin-secret -o jsonpath="
{.data.password}"
PS E:\Devops\Proj_k> $decodedSecret = [System.Text.Encoding]::UTF8.GetString([System.Convert]::FromBa
se64String($secret))
PS E:\Devops\Proj_k> Write-Output $decodedSecret
mSumtHOXI4tVByDy
PS E:\Devops\Proj_k>
PS E:\Devops\Proj_k>
```

->Creation of the argocd reposistory for the syncing and managing the changes



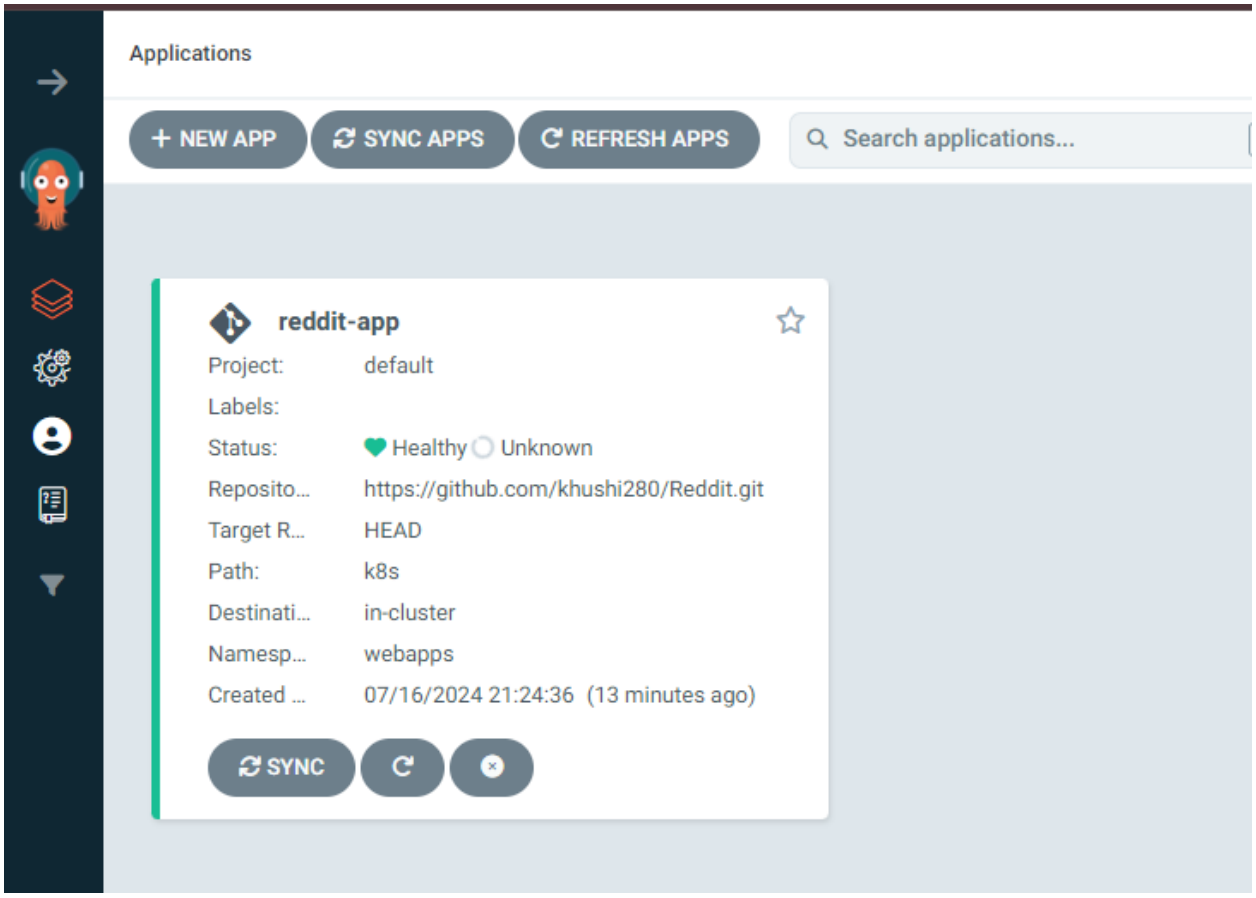
->The argocd syncing of the application

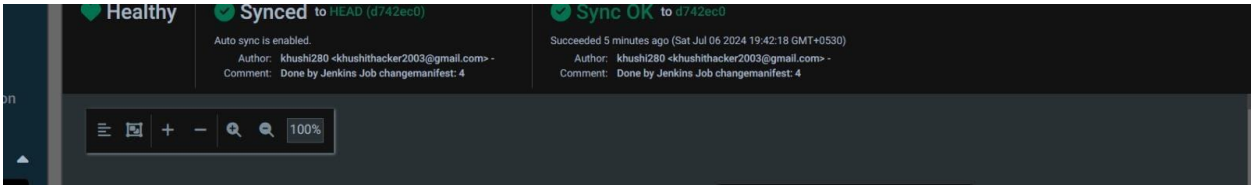


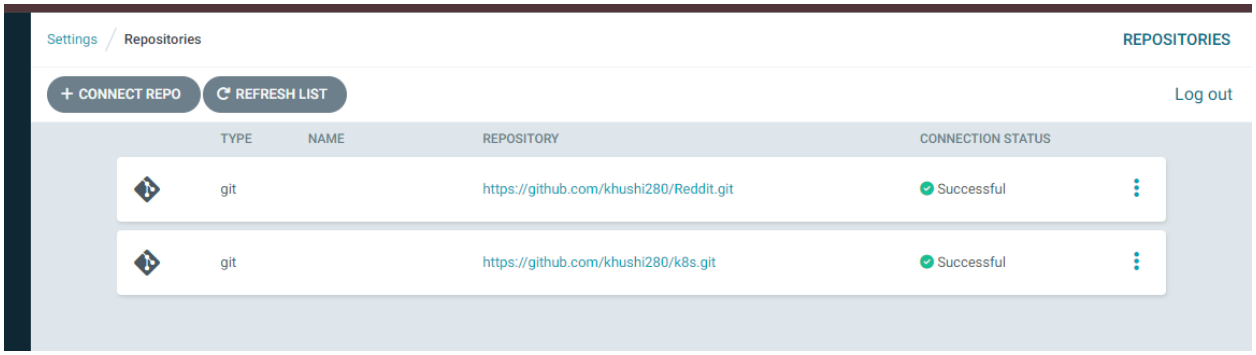
Configuring the argo-cd cli

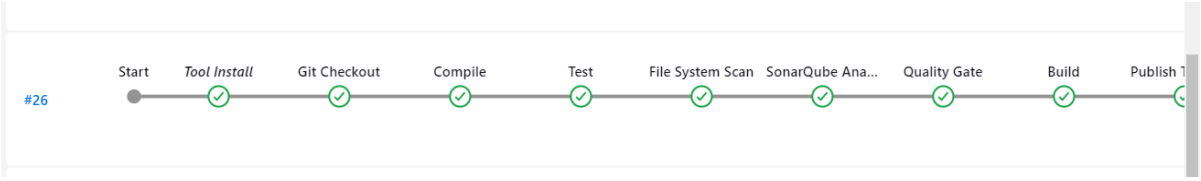
```
ShimGen has successfully created a shim for argocd.exe
The install of argocd-cli was successful.
 Software install location not explicitly set, it could be in package or
 default install location of installer.

Chocolatey installed 1/1 packages.
 See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).
```

->Successful configuration of the argocd pipeline


Applications
+ NEW APP
SYNC APPS
REFRESH APPS
Search applications...
reddit-app
Project: default
Labels:
Status: Healthy Unknown
Reposito... https://github.com/khushi280/Reddit.git
Target R... HEAD
Path: k8s
Destinati... in-cluster
Namesp... webapps
Created ... 07/16/2024 21:24:36 (13 minutes ago)
SYNC


Healthy
Synced to HEAD (d742ec0)
Auto sync is enabled.
Author: khushi280 <khushithacker2003@gmail.com> -
Comment: Done by Jenkins Job changemanifest: 4
Sync OK to d742ec0
Succeeded 5 minutes ago (Sat Jul 06 2024 19:42:18 GMT+0530)
Author: khushi280 <khushithacker2003@gmail.com> -
Comment: Done by Jenkins Job changemanifest: 4
100%


Settings / Repositories
REPOSITORIES
+ CONNECT REPO
REFRESH LIST
Log out
TYPE NAME REPOSITORY CONNECTION STATUS
git https://github.com/khushi280/Reddit.git Successful
git https://github.com/khushi280/k8s.git Successful



Prometheus is an open-source monitoring and alerting toolkit designed for reliability and scalability in dynamic environments like cloud-native applications and microservices.

- **Metrics Collection**: Prometheus collects metrics from monitored targets by scraping HTTP endpoints at regular intervals.
- **Data Model**: It stores time-series data in a custom, efficient format, allowing flexible querying for monitoring and alerting.
- **Service Discovery**: Supports dynamic service discovery through integrations with Kubernetes, Consul, and other service discovery mechanisms.
- **Alerting**: Provides flexible alerting rules based on Prometheus's query language (PromQL), enabling real-time alerting on metrics anomalies.
- **Visualization**: While Prometheus itself focuses on data collection and alerting, it integrates with visualization tools like Grafana for more advanced dashboarding and analysis.

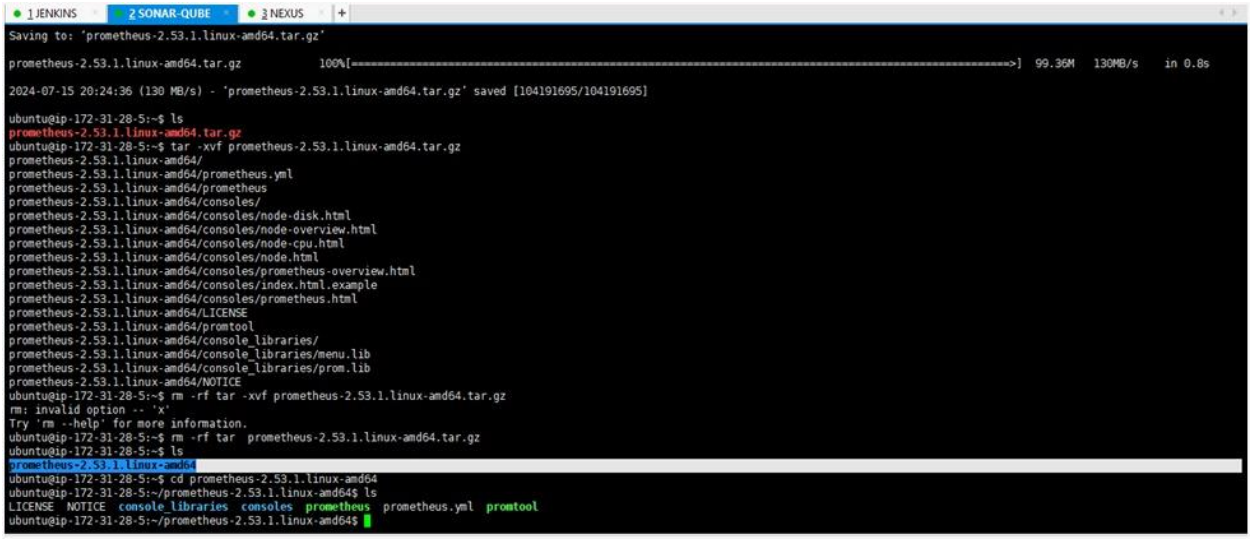
Grafana

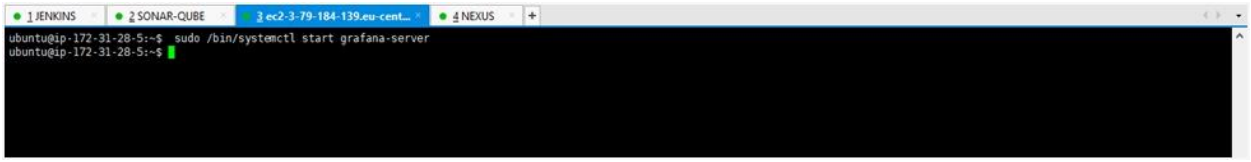
Purpose: Grafana is an open-source platform for monitoring and observability, allowing users to query, visualize, alert on, and understand metrics from multiple sources.

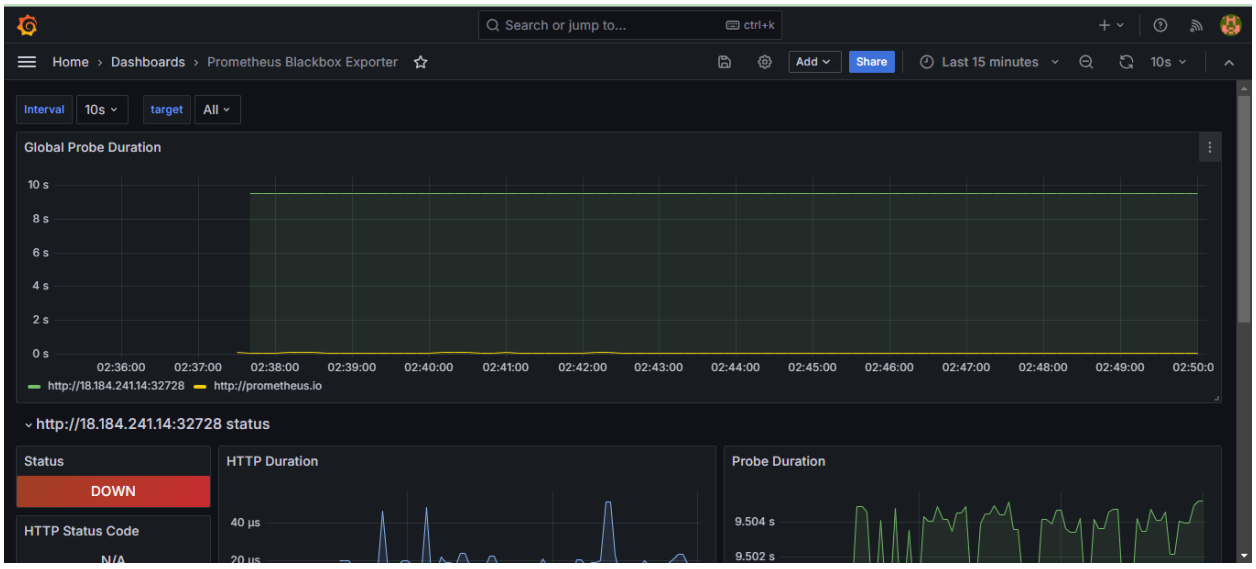
- **Visualization**: Grafana offers powerful visualization capabilities, including graphs, charts, and histograms, to create comprehensive dashboards for monitoring and analysis.
- **Data Source Integration**: Integrates with various data sources, including Prometheus, Elasticsearch, InfluxDB, MySQL, and more, enabling unified visualization and analysis across multiple systems.
- **Alerting and Notifications**: Provides alerting features to notify users of important changes or incidents based on predefined thresholds and conditions.
- **Dashboard Templating**: Supports dashboard templating, allowing users to create dynamic, reusable dashboards that adapt to different environments or use cases.

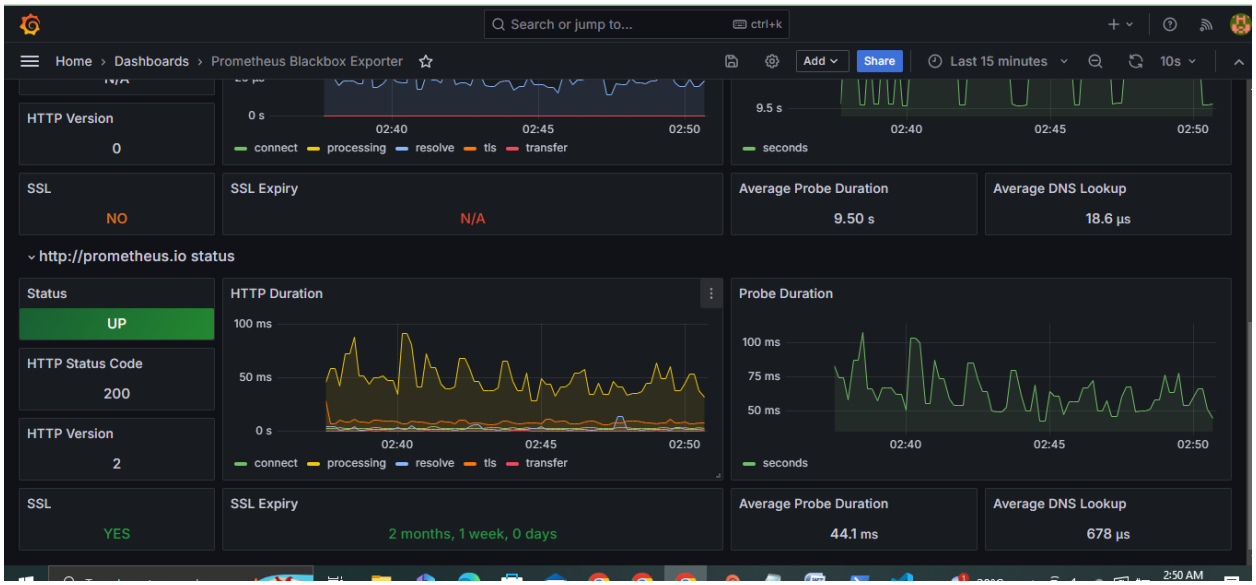
->Installation of the grafana and promethus and configuring its dashboard

Monitoring of the complete infrastructure of promtheus,application and Jenkins

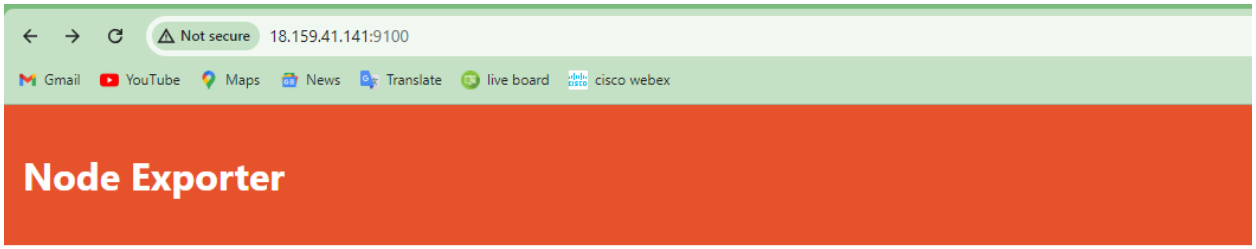

1 JENKINS
2 SONAR-QUBE
3 NEXUS
Saving to: 'prometheus-2.53.1.linux-amd64.tar.gz'
prometheus-2.53.1.linux-amd64.tar.gz 100%[==========>] 99.36M 130MB/s in 0.8s
2024-07-15 20:24:36 (130 MB/s) - 'prometheus-2.53.1.linux-amd64.tar.gz' saved [104191695/104191695]
ubuntu@ip-172-31-28-5:~$ ls
prometheus-2.53.1.linux-amd64.tar.gz
ubuntu@ip-172-31-28-5:~$ tar -xvf prometheus-2.53.1.linux-amd64.tar.gz
prometheus-2.53.1.linux-amd64/
prometheus-2.53.1.linux-amd64/prometheus.yml
prometheus-2.53.1.linux-amd64/prometheus
prometheus-2.53.1.linux-amd64/consoles/
prometheus-2.53.1.linux-amd64/consoles/node-disk.html
prometheus-2.53.1.linux-amd64/consoles/node-overview.html
prometheus-2.53.1.linux-amd64/consoles/node-cpu.html
prometheus-2.53.1.linux-amd64/consoles/node.html
prometheus-2.53.1.linux-amd64/consoles/prometheus-overview.html
prometheus-2.53.1.linux-amd64/consoles/index.html.example
prometheus-2.53.1.linux-amd64/consoles/prometheus.html
prometheus-2.53.1.linux-amd64/LICENSE
prometheus-2.53.1.linux-amd64/promtool
prometheus-2.53.1.linux-amd64/console_libraries/
prometheus-2.53.1.linux-amd64/console_libraries/menu.lib
prometheus-2.53.1.linux-amd64/console_libraries/prom.lib
prometheus-2.53.1.linux-amd64/NOTICE
ubuntu@ip-172-31-28-5:~$ rm -rf tar -xvf prometheus-2.53.1.linux-amd64.tar.gz
rm: invalid option -- 'x'
Try 'rm --help' for more information.
ubuntu@ip-172-31-28-5:~$ rm -rf tar prometheus-2.53.1.linux-amd64.tar.gz
ubuntu@ip-172-31-28-5:~$ ls
prometheus-2.53.1.linux-amd64
ubuntu@ip-172-31-28-5:~$ cd prometheus-2.53.1.linux-amd64
ubuntu@ip-172-31-28-5:~/prometheus-2.53.1.linux-amd64$ ls
LICENSE NOTICE console_libraries consoles prometheus prometheus.yml promtool
ubuntu@ip-172-31-28-5:~/prometheus-2.53.1.linux-amd64$


1 JENKINS
2 SONAR-QUBE
3 ec2-3-79-184-139.eu-cent...
4 NEXUS
ubuntu@ip-172-31-28-5:~$ sudo /bin/systemctl start grafana-server
ubuntu@ip-172-31-28-5:~$


Search or jump to...
ctrl+k
Home › Dashboards › Prometheus Blackbox Exporter
Add
Share
Last 15 minutes
10s
Interval
10s
target
All
Global Probe Duration
10 s
8 s
6 s
4 s
2 s
0 s
02:36:00
02:37:00
02:38:00
02:39:00
02:40:00
02:41:00
02:42:00
02:43:00
02:44:00
02:45:00
02:46:00
02:47:00
02:48:00
02:49:00
02:50:0
http://18.184.241.14:32728
http://prometheus.io
http://18.184.241.14:32728 status
Status
DOWN
HTTP Status Code
N/A
HTTP Duration
40 µs
20 µs
Probe Duration
9.504 s
9.502 s



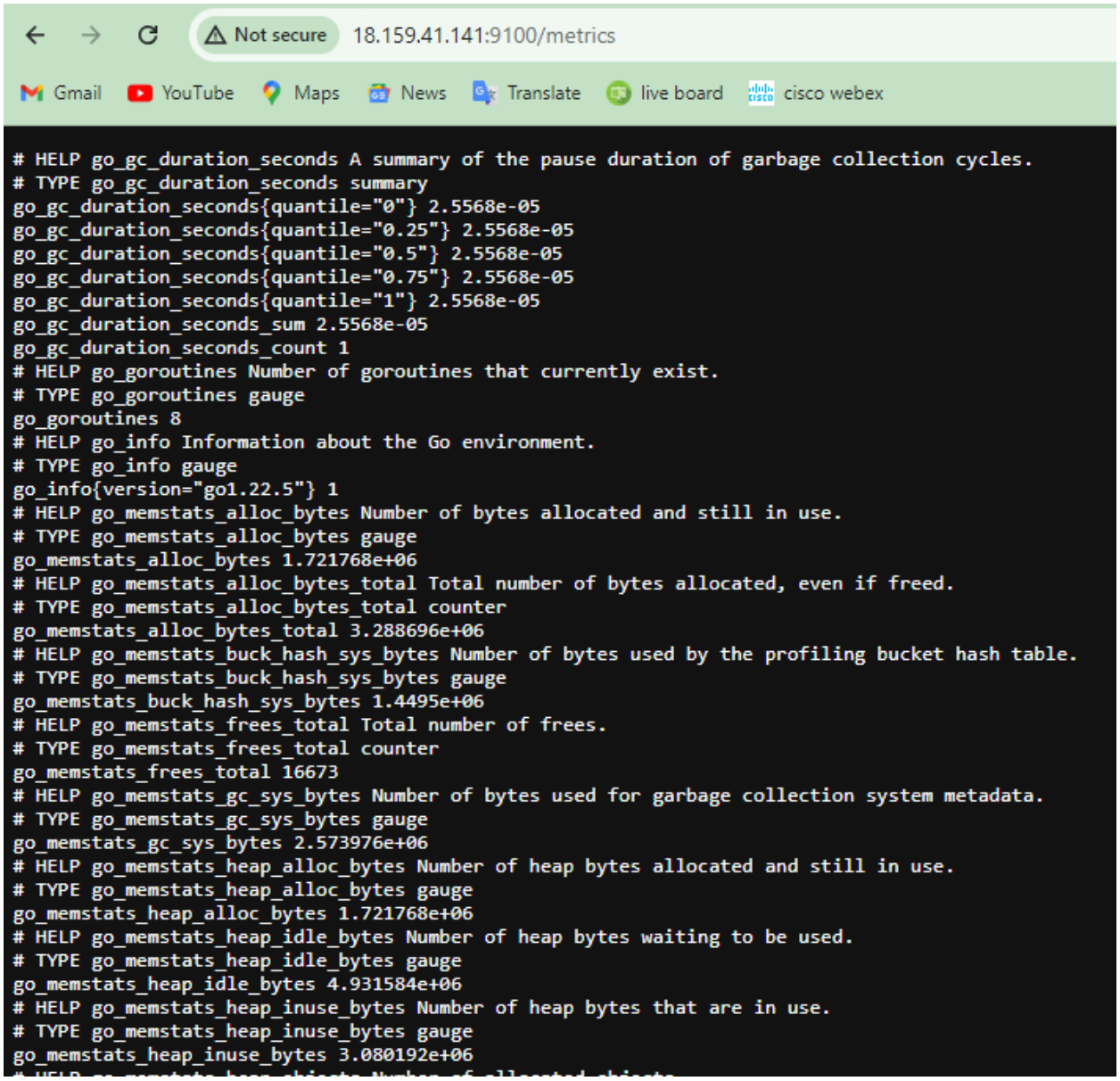
->Node exporter configuration for the view of the metrics

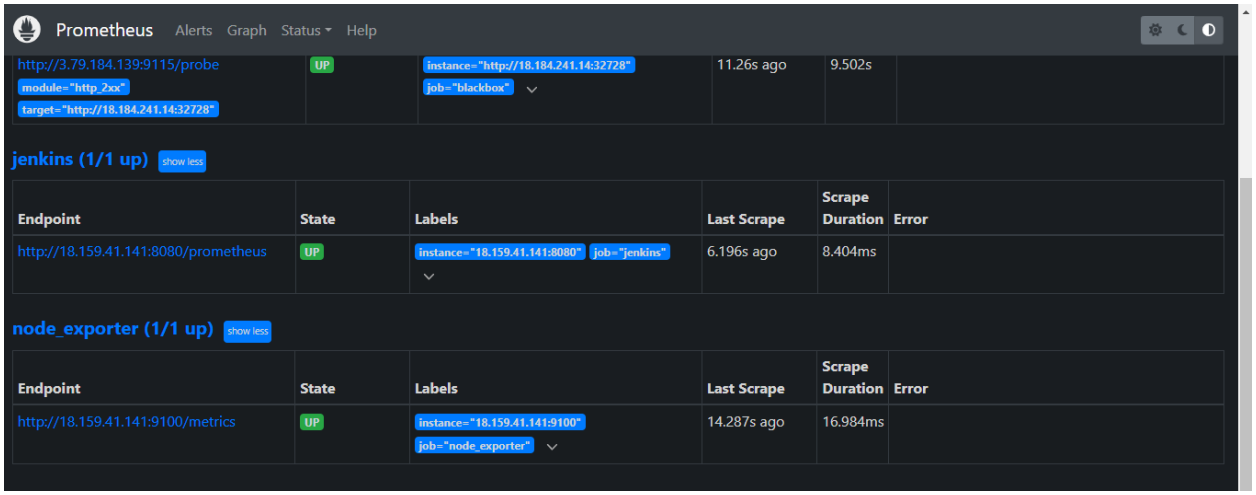


Prometheus Node Exporter

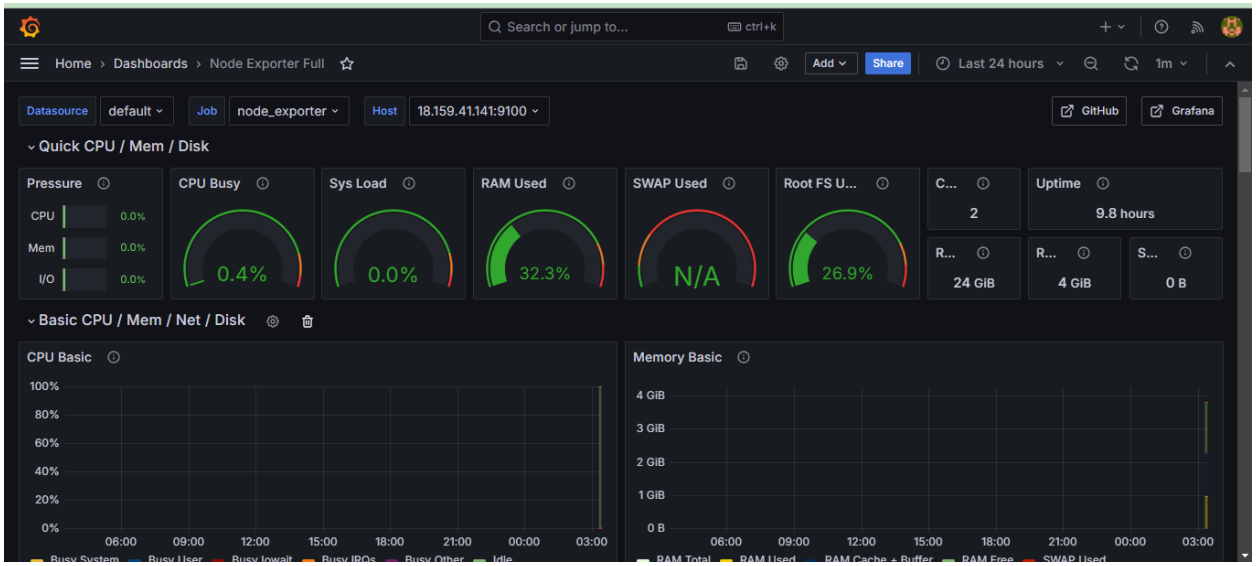
Version: (version=1.8.2, branch=HEAD, revision=f1e0e8360aa60b6cb5e5cc1560bed348fc2c1895)

- Metrics


Not secure
18.159.41.141:9100/metrics
Gmail
YouTube
Maps
News
Translate
live board
cisco webex
HELP go_gc_duration_seconds A summary of the pause duration of garbage collection cycles.
TYPE go_gc_duration_seconds summary
go_gc_duration_seconds{quantile="0"} 2.5568e-05
go_gc_duration_seconds{quantile="0.25"} 2.5568e-05
go_gc_duration_seconds{quantile="0.5"} 2.5568e-05
go_gc_duration_seconds{quantile="0.75"} 2.5568e-05
go_gc_duration_seconds{quantile="1"} 2.5568e-05
go_gc_duration_seconds_sum 2.5568e-05
go_gc_duration_seconds_count 1
HELP go_goroutines Number of goroutines that currently exist.
TYPE go_goroutines gauge
go_goroutines 8
HELP go_info Information about the Go environment.
TYPE go_info gauge
go_info{version="go1.22.5"} 1
HELP go_memstats_alloc_bytes Number of bytes allocated and still in use.
TYPE go_memstats_alloc_bytes gauge
go_memstats_alloc_bytes 1.721768e+06
HELP go_memstats_alloc_bytes_total Total number of bytes allocated, even if freed.
TYPE go_memstats_alloc_bytes_total counter
go_memstats_alloc_bytes_total 3.288696e+06
HELP go_memstats_buck_hash_sys_bytes Number of bytes used by the profiling bucket hash table.
TYPE go_memstats_buck_hash_sys_bytes gauge
go_memstats_buck_hash_sys_bytes 1.4495e+06
HELP go_memstats_frees_total Total number of frees.
TYPE go_memstats_frees_total counter
go_memstats_frees_total 16673
HELP go_memstats_gc_sys_bytes Number of bytes used for garbage collection system metadata.
TYPE go_memstats_gc_sys_bytes gauge
go_memstats_gc_sys_bytes 2.573976e+06
HELP go_memstats_heap_alloc_bytes Number of heap bytes allocated and still in use.
TYPE go_memstats_heap_alloc_bytes gauge
go_memstats_heap_alloc_bytes 1.721768e+06
HELP go_memstats_heap_idle_bytes Number of heap bytes waiting to be used.
TYPE go_memstats_heap_idle_bytes gauge
go_memstats_heap_idle_bytes 4.931584e+06
HELP go_memstats_heap_inuse_bytes Number of heap bytes that are in use.
TYPE go_memstats_heap_inuse_bytes gauge
go_memstats_heap_inuse_bytes 3.080192e+06



->Monitoring of the jenkins



Conclusion

In conclusion, this CI/CD pipeline establishes a structured approach to software delivery, integrating automated testing, security checks, deployment orchestration, and monitoring. By leveraging Jenkins for build automation, ArgoCD for GitOps-driven deployments, and tools like SonarQube, Nexus, Trivy, Prometheus, and Grafana for quality assurance, artifact management, security scanning, and monitoring, the pipeline ensures continuous improvement in software quality, reliability, and performance across the development lifecycle.

KHUSHI THACKER -21bctc91