prime video Clone App — End-to-End Secure &

Scalable Deployment with DevSecOps & Jenkins!

Thrilled to showcase our latest project — a prime video **Clone Application** engineered with a **DevSecOps CI/CD pipeline** and powered by **Jenkins** Parameterise Build to deliver fully automated, secure, and scalable deployments.



prime video Clone App — End-to-End Secure & Scalable Deployment with DevSecOps & Jenkins!

Tech Stack & Key Integration

- Kubernetes & Docker for seamless, containerized, and scalable application deployments Jenkins — to enable reusable, standardized, and consistent CI/CD pipelines.
- SonarQube, Trivy, OWASP Dependency-Check ensuring robust security, vulnerability scanning, and code quality automation.
- Prometheus & Grafana for comprehensive real-time monitoring and alerting.
- Gmail Email alerts and collaboration-driven notifications
- Parameterized environment orchestration for on-demand infrastructure setup and teardown.

Key Highlights & Takeaways:

- Security-by-design with integrated DevSecOps practices
- Automated, reusable pipelines ensuring consistency and efficiency
- Production-grade scalability leveraging Kubernetes
- Rapid deployment lifecycle driven by modern CI/CD automation

This solution represents a blueprint for secure, scalable, and production-ready application delivery, embodying best practices in DevSecOps, automation, and cloud-native architecture.

Now, let's get started and dig deeper into each of these steps:

STEP 1: Configure Infrastructure In AWS Cloud

- Launch an EC2 Instance Ubuntu (22.04) T3 X Large Instance
- Go to the AWS Management Console → EC2 → Instances.Click Launch Instance.
- Set the following configurations:
- Name: <Instance_Name>
- AMI (Amazon Machine Image): Ubuntu Server 22.04 LTS (HVM), SSD Volume type.
- Instance Type: t3.xlarge (4 vCPUs, 16 GB RAM) o
- Key Pair: Select an existing key pair or create a new one.
- Storage: Default (e.g., 30GB GP3 SSD, adjust as needed

STEP 2 : Configure Security Group

Port	Protocol	Description
22	TCP	SSH (for remote access)
80	TCP	HTTP (Web traffic)
443	TCP	HTTPS (Secure web traffic)
8080	TCP	Web applications (Tomcat, etc.)
587	TCP	SMTP (Email sending)
465	TCP	SMTP over SSL
3000	TCP	Web apps (Grafana, Node.js, etc.)
9000	TCP	SonarQube/Web apps

Connect EC2 Instance through terminus, mobaxterm

STEP 2 : Install Jenkins, Docker , awscli, terraform, kubectl , eksctl and Trivy

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Access Jenkins in your browser:

http://<public_TP>:8080

Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

/var/lib/jenkins/secrets/initialAdminPassword

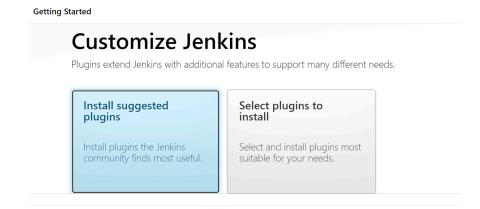
Please copy the password from either location and paste it below.

Administrator password

Unlock Jenkins using an administrative password and install the suggested plugins.
 Retrieve the initial admin password:

sudo cat /var/lib/jenkins/secrets/initialAdminPassword Unlock Jenkins using an

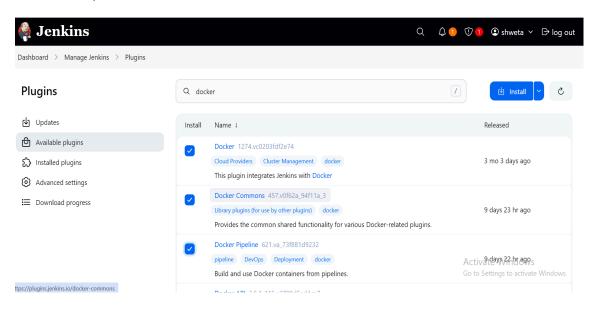
administrative password and install the suggested plugins.



- Create a user click on save and continue.
- Jenkins Getting Started Screen.
- Follow the setup wizard and install recommended plugins.

Install Plugins like JDK, SonarQube Scanner, NodeJs, OWASP Dependency Check Goto Manage Jenkins → Plugins → Available Plugins → Install below plugins

- 1. Eclipse Temurin Installer (Install without restart)
- 2. SonarQube Scanner (Install without restart)
- 3. NodeJs Plugin (Install Without restart) 16.20.2
- 4. OWASP Dependency Check Plugins
- 5. Stage view
- 6. jdk Docker plugin
- 7. Docker 8. Docker Commons
- 9. Docker Pipeline
- 10. Docker API
- 11. Docker-build-step



- Setup SonarQube Server
- we create a sonarqube container

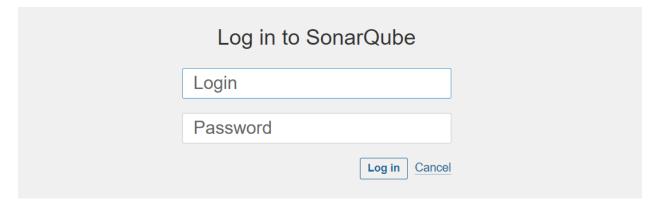
docker run -d --name sonar -p 9000:9000 sonarqube:

```
ubuntu@ip-172-31-4-238:~/hotstar-kubernetes/scripts$ docker run -d --name sonar
:9000 sonarqube:lts-community
Unable to find image 'sonarqube:lts-community' locally
lts-community: Pulling from library/sonarqube
89dc6ea4eae2: Pull complete
31436012ac5b: Pull complete
2d16eb76e762: Pull complete
ac81863d97cb: Pull complete
26f6dfeccc10: Pull complete
47343cdb8fb1: Pull complete
7c8e090ec954: Pull complete
4f4fb700ef54: Pull complete
Digest: sha256:lf0acc4139fc0bf09f39b962a63b56b10393cb0d07a4aa28346ea0af5b95f764
Status: Downloaded newer image for sonarqube:lts-community
cf1e37d1fe68d89a6ffe2e352a718c13b922e48aa69e6c887c87f2eae7e93d50
```

Now SonarQube server is running you can access it from

<publicIP of Instance>:9000

• Login to SonarQube (default username and password is : admin-admin)



 Enter username and password, click on login and change password username admin password admin

username admin

password admin

Update your password

This account should not use the default password.

Enter a new password

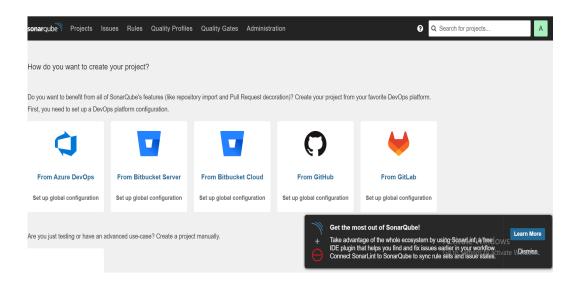
All fields marked with * are required

Old Password *

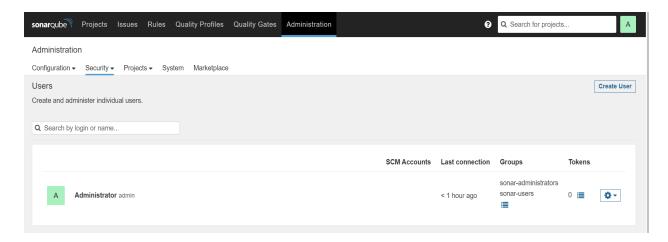
New Password *

Confirm Password *

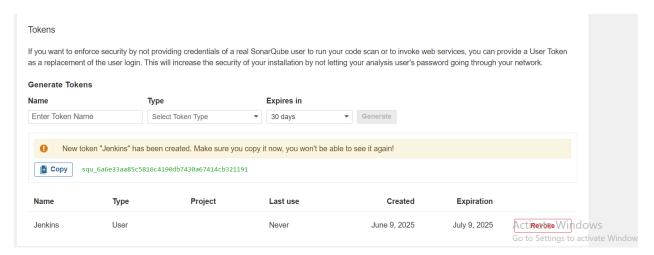
Update New password, This is Sonar Dashboard



B. - Create Sonar token in order to connect with Jenkins Click on Administration \to Security \to Users \to Click on Tokens and Update Token \to Give it a name \to and click on Generate Token



Create a token with a name and generate



Go to manage jenkins & add Credentials -> Add Secret Text. It should look like this

New credentials Kind Secret text Scope ? Global (Jenkins, nodes, items, all child items, etc) Secret ID ? Sonar-token Activate Windows Go to Settings to activate Windows

Now, go to Dashboard \rightarrow Manage Jenkins \rightarrow System and Add like the below image

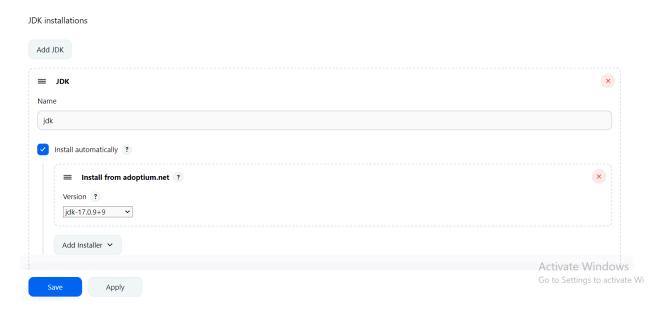


The Configure System option is used in Jenkins to configure different server Global Tool Configuration is used to configure different tools that

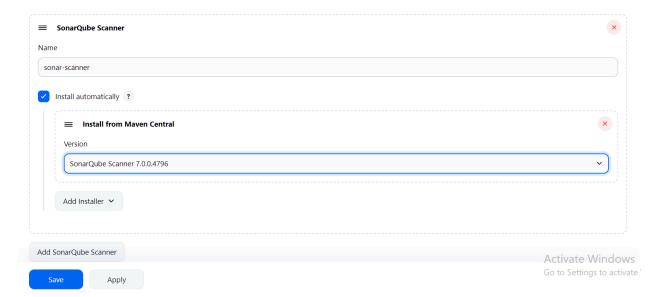
We install using Plugins We will install a sonar scanner in the tools.

Manage Jenkins -> Tools -> SonarQube Scanner

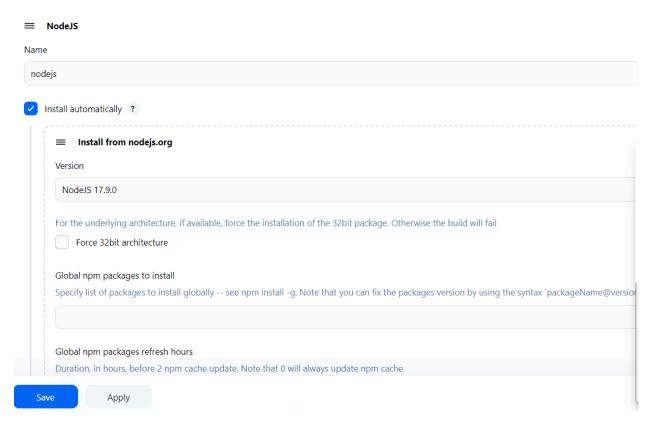
1.JDK Configuration



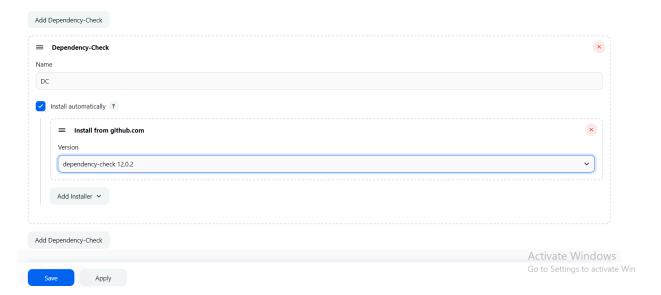
2. Configuration of sonar-scanner



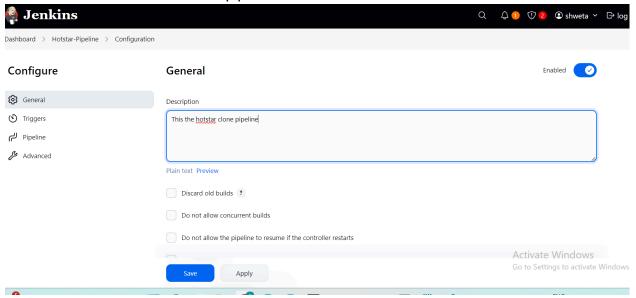
3. Configuration of nodejs



4. Configure Dependency Check



Create Job for Hotstar Let's add a pipeline:



Setup Jenkins GitHub token inorder to connect with Private Registry

- Generate Classic GitHub Token

Go to GitHub \rightarrow Settings \rightarrow Developer Settings \rightarrow Personal Access Tokens. Click Generate new token (classic). Set Expiration (or No Expiration if required).

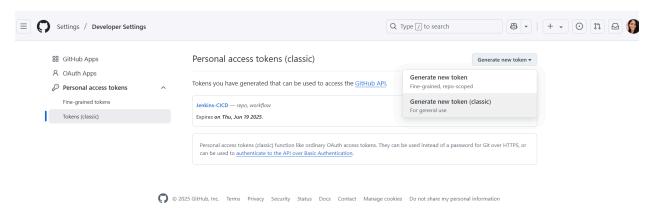
Set Scopes:

o repo \rightarrow Full control of private repositories.

o admin:repo_hook → Manage repository webhooks.

o workflow → Required for GitHub Actions (optional).

Click Generate token and copy the token



Configure Jenkins with GitHub Token Add Credentials in Jenkins

1. Go to Jenkins Dashboard \rightarrow Manage Jenkins \rightarrow Manage Credentials.

2. Click Global Credentials (Unrestricted) → Add Credentials.

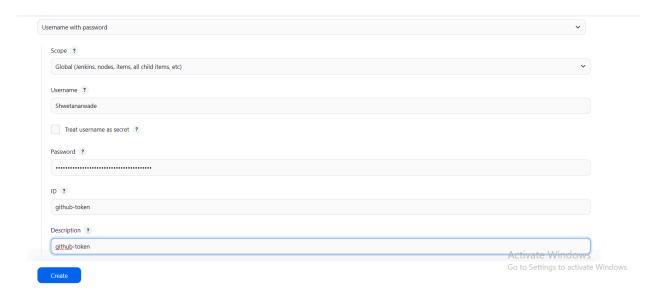
3. Select: o Kind: Username and password

o Username: Your GitHub username

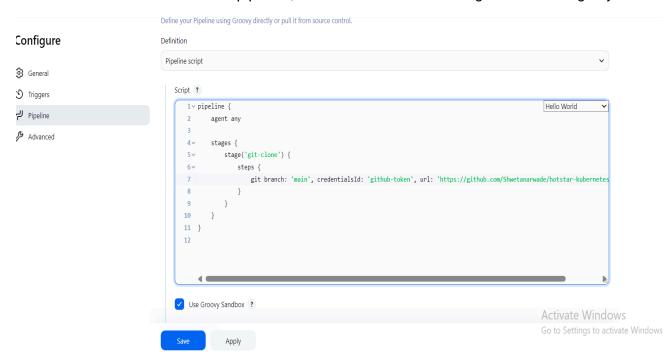
o Password: Paste your GitHub Token

o ID: github-token

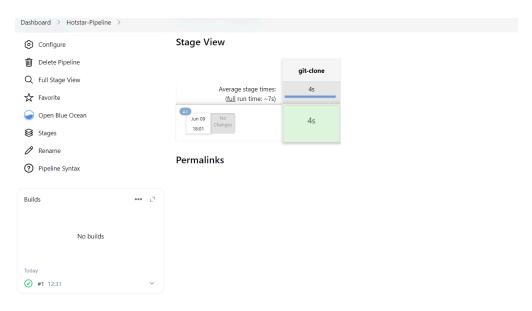
o Description: GitHub Classic Token



Create Job for Hotstar Let's add a pipeline, to test the Github Clone stage of Private Registry



Apply and Save and click on Build



Add docker credentials



Install Dockers scout in the app server Install Docker Scout: docker login Give Dockerhub credentials here curl - sSfL https://raw.githubusercontent.com/docker/scout-cli/main/install.sh | sh - s - b /usr/local/bin

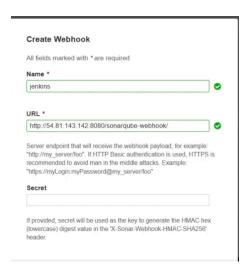
```
Username: aseemakram19
IARNING! Your password will be stored unencrypted in /home/ubuntu/.docker/config.json.
configure a credential helper to remove this warning. See
nttps://docs.docker.com/engine/reference/commandline/login/#credentials-store
Login Succeeded
ubuntu@ip-10-0-1-103:/var/lib/jenkins/workspace/amazon-prime-video$ curl -sSfL https://raw.g
<u>ithubusercontent.com/docker/scout-cli/main/install.sh</u> | sh -s -- -b /usr/local/bin<sup>*</sup>
info] fetching release script for tag='v1.17.1'
info] using release tag='v1.17.1' version='1.17.1' os='linux' arch='amd64'
install: cannot create regular file '/usr/local/bin/docker-scout': Permission denied
error] failed to install docker-scout
ubuntu@ip-10-0-1-103:/var/lib/jenkins/workspace/amazon-prime-video$ sudo su
root@ip-10-0-1-103:/var/lib/jenkins/workspace/amazon-prime-video# curl -sSfL <u>https://raw.gi</u>t
<u> hubusercontent.com/docker/scout-cli/main/install.sh | sh -s -- -b /usr/local/bin</u>
info] fetching release script for tag='v1.17.1
info] using release tag='v1.17.1' version='1.17.1' os='linux' arch='amd64'
info] installed /usr/local/bin/docker-scout
root@ip-10-0-1-103:/var/lib/jenkins/workspace/amazon-prime-video# 📕
```

In the Sonarqube Dashboard add a quality gate also

Administration -> Configuration -> Webhooks



Create a webhook



Create a Gmail SMTP App Password

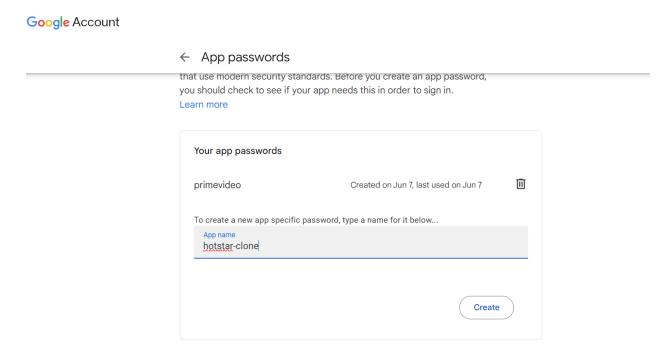
An App Password is a 16-character password that allows third-party applications (like Jenkins) to send emails using Gmail SMTP securely.

Step 1: Enable 2-Step Verification Before generating an App Password, you must enable 2-Step Verification in your Google Account.

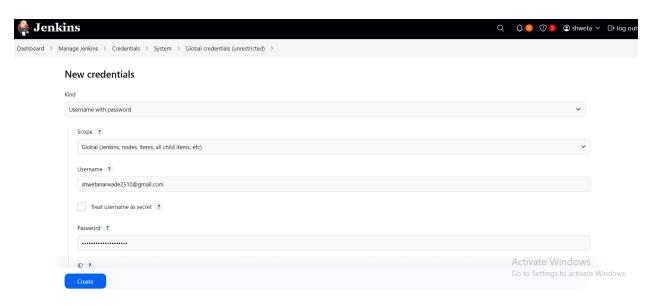
- 1. Go to Google Account Security: Google My Account
- 2. Scroll to "Signing in to Google".
- 3. Click "2-Step Verification" → Click "Get Started".
- 4. Follow the steps to set up 2-Step Verification (via SMS or Authenticator App).

Step 2: Generate an App Password

- 1. Go to App Passwords Page: Google App Passwords
- 2. Sign in with your Google Account.
- 3. Under "Select app", choose "Mail".
- 4. Under "Select device", choose "Other (Custom Name)" and enter "Jenkins SMTP".
- 5. Click "Generate".
- 6. Copy the 16-character App Password (e.g., abcd efgh ijkl mnop).

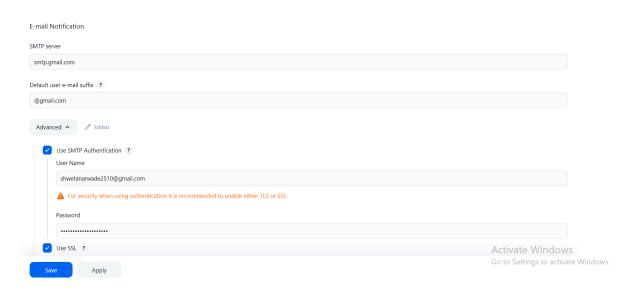


Add credentials as Username and password in jenkins



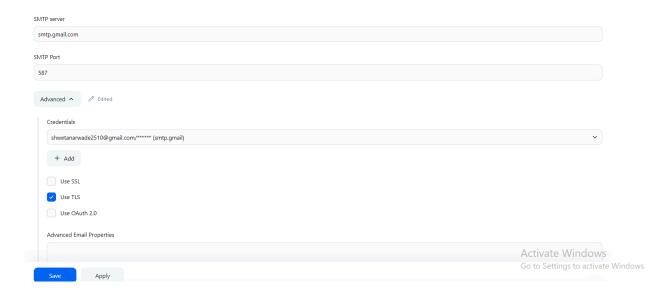
Step 3: Configure Gmail SMTP in Jenkins

- 1. Go to Jenkins Dashboard \rightarrow Manage Jenkins \rightarrow Configure System.
- 2. Scroll to "E-mail Notification".
- 3. Set the following: o SMTP Server: smtp.gmail.com
- o Use SMTP Authentication: Checked o User Name: Your Gmail ID (your-email@gmail.com)
- o Password: Paste the App Password
- o SMTP Port: 465
- o Use TLS: Checked



4. Click Save. Email Extension Plugin xsuc kxeb xcvk xqkf

- 1. Basic Email Notification SMTP Server: smtp.gmail.com
 - Email Suffix: @gmail.com (default user email domain)
 - SMTP Authentication: Enabled
 - Username: Your Gmail address
 - Password: Your Gmail password or App Password (for 2-factor authentication)
 - Use TLS: CheckedSMTP Port: 587
 - Reply-To Address: Your email address
 - Charset: UTF-8



Jenkins Credentials Provider: Jenkins Global (Jenkins, nodes, items, all child items, etc) Username ? shwetanarwade2510@gmail.com Treat username as secret ? Password ? ID ? smtp.gmail Description ? smtp.gmail

Add your gmail credentials in credentials section of Jenkins

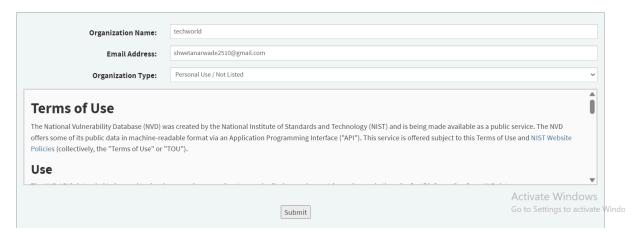
And last Register for NVD API for Dependency Check The National Vulnerability Database (NVD) API provides access to security vulnerabilities (CVEs) and is often used with tools like OWASP Dependency-Check to identify security risks in software dependencies.

Step 1: Create an NVD API Key

- 1. Go to the NVD API Registration Page:
- o Open: NVD API Registration
- 2. Sign In or Create an Account:
- o Click Sign In (or create an account if you don't have one).
- 3. Request an API Key:
- o Provide your details and agree to the terms.
- o Click Submit.
- 4. Receive API Key via Email:
- o Once approved, you'll receive an API key.

Request an API Key

To request an NVD API Key, please provide your organization name and a valid email address, and indicate your organization type. You must scroll to end of the Terms of Use Agreement and check "I agree to the Terms of Use" to obtain an API Key. Upon submitting the request, you will receive an email containing a single-use hyperlink that is used to activate and view your API Key. If your key is not activated within seven days, a new request for an API Key must be submitted.



Then Configure the pipeline

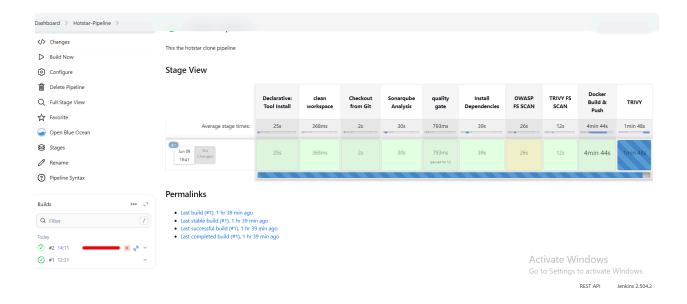
```
pipeline{
   agent any
   tools{
      jdk'jdk'
      nodejs 'node17'
   }
   environment {
      SCANNER_HOME=tool 'sonar-scanner'
   }
   stages {
      stage('clean workspace'){
      steps{
       cleanWs()
      }
   }
}
```

```
stage('Checkout from Git'){
      steps{
        git branch: 'main', url:
'https://github.com/Aseemakram19/amazon-prime-video-kubernetes.git'
      }
    }
    stage("Sonarqube Analysis "){
      steps{
        withSonarQubeEnv('SonarQube') {
          sh " $SCANNER_HOME/bin/sonar-scanner
-Dsonar.projectName=amazon-prime-video \
          -Dsonar.projectKey=amazon-prime-video "
        }
      }
    }
    stage("quality gate"){
      steps {
        script {
          waitForQualityGate abortPipeline: false, credentialsId: 'Sonar-token'
        }
      }
    }
    stage('Install Dependencies') {
      steps {
        sh "npm install"
      }
    }
```

```
stage('TRIVY FS SCAN') {
  steps {
    sh "trivy fs . > trivyfs.txt"
  }
}
stage("Docker Build & Push"){
  steps{
    script{
      withDockerRegistry(credentialsId: 'docker', toolName: 'docker'){
        sh "docker build -t amazon-prime-video ."
        sh "docker tag amazon-prime-video aseemakram19/amazon-prime-video:latest"
        sh "docker push aseemakram19/amazon-prime-video:latest"
      }
    }
  }
}
          stage('Docker Scout Image') {
  steps {
    script{
      withDockerRegistry(credentialsId: 'docker', toolName: 'docker'){
        sh 'docker-scout quickview aseemakram19/amazon-prime-video:latest'
        sh 'docker-scout cves aseemakram19/amazon-prime-video:latest'
        sh 'docker-scout recommendations aseemakram19/amazon-prime-video:latest'
      }
    }
```

```
}
    stage("TRIVY-docker-images"){
      steps{
        sh "trivy image aseemakram19/amazon-prime-video:latest > trivyimage.txt"
     }
    }
    stage('App Deploy to Docker container'){
      steps{
        sh 'docker run -d --name amazon-prime-video -p 3000:3000
aseemakram19/amazon-prime-video:latest'
      }
   }
 }
  post {
  always {
    script {
      def buildStatus = currentBuild.currentResult
      def buildUser =
currentBuild.getBuildCauses('hudson.model.Cause$UserIdCause')[0]?.userId ?: 'Github User'
      emailext (
        subject: "Pipeline ${buildStatus}: ${env.JOB_NAME} #${env.BUILD_NUMBER}",
        body: """
          This is a Jenkins amazon-prime-video CICD pipeline status.
          Project: ${env.JOB_NAME}
```

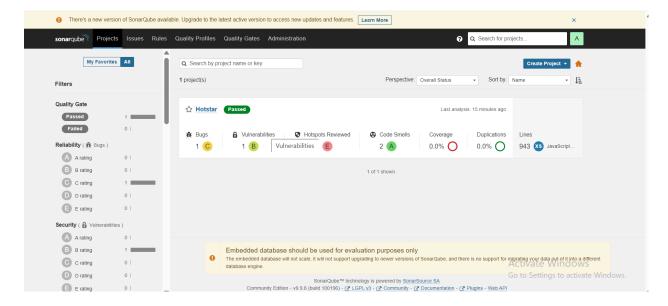
```
Build Number: ${env.BUILD_NUMBER}
         Build Status: ${buildStatus}
         Started by: ${buildUser}
         Suild URL: <a href="${env.BUILD_URL}">${env.BUILD_URL}</a>
       to: 'mohdaseemakram19@gmail.com',
       from: 'mohdaseemakram19@gmail.com',
       replyTo: 'mohdaseemakram19@gmail.com',
       mimeType: 'text/html',
       attachmentsPattern: 'trivyfs.txt,trivyimage.txt'
     )
   }
 }
Stage View after building pipeline
```



Our Application is live with this output

<publicip_of_instance>:3000

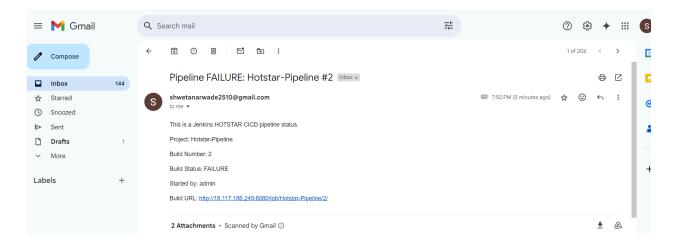
You can see the report has been generated and the status shows as passed. You can see that there are 943 lines it scanned. To see a detailed report, you can go to issues. You will see that in status, a graph will also be generated and Vulnerabilities.



Our Application is live with this output



Email alert with Post build



2. Verify Docker Images in Dockerhub

