🚀 **Successfully Completed My CI/CD Pipeline Project with AWS ECS, Jenkins, Terraform, and Trivy!** 🚀

I’m excited to share that I have successfully implemented a **fully automated CI/CD pipeline** using **Terraform, AWS ECS, Jenkins, Docker, SonarQube, and Trivy** for containerized application deployment.

🔹 **Project Highlights:**

✅ **Infrastructure as Code (IaC)** – Automated infrastructure provisioning with **Terraform**, hosted on **GitHub**.

✅ **CI/CD Automation** – Configured **GitHub Actions** to trigger Jenkins pipelines.

✅ **Code Quality & Security** – Integrated **SonarQube** for static code analysis and **Trivy** for vulnerability scanning.

✅ **Dockerized Deployment** – Built and pushed Docker images to **DockerHub**, deploying to **AWS ECS**.

✅ **Live Monitoring** – Ensured **automated quality checks** before deployment.

🔹 **Technologies Used:**

✔ **Terraform** – Infrastructure Automation

✔ **AWS ECS** – Container Orchestration

✔ **Jenkins** – CI/CD Pipeline

✔ **SonarQube** – Code Quality Analysis

✔ **Trivy** – Security Scanning

✔ **Docker & GitHub Actions** – Deployment Automation

💡 **Key Takeaways:**

📌 Learned best practices in **DevOps, security, and cloud automation**.

📌 Implemented a **scalable, secure, and efficient deployment workflow**.

📌 Hosted project **Terraform code & pipeline configurations on GitHub**.

🔗 **GitHub Repo:** [Add your GitHub link here]

🔗 **Live App Link:** [Add your app link here]

A huge thanks to the community for all the learning resources and guidance. Looking forward to applying these skills to real-world projects! 🚀

#AWS #Terraform #Jenkins #ECS #DevOps #CI/CD #Docker #SonarQube #Trivy #Cloud #Automation

## 📌 Project Overview

The project involved implementing a fully automated CI/CD pipeline with **infrastructure as code** using Terraform and automated quality and security checks. The pipeline ensures a seamless workflow from code commit to deployment.

**🛠️ Tech Stack**

* **Terraform** - Infrastructure as Code (IaC) for AWS setup
* **AWS ECS** - Elastic Container Service for containerized deployment
* **Jenkins** - CI/CD automation
* **Docker** - Containerization
* **SonarQube** - Code quality analysis
* **Trivy** - Security vulnerability scanning

1️⃣ **Provisioning Infrastructure using Terraform**

* Created EC2 instances for Jenkins and SonarQube.
* Configured **Security Groups** for inbound access to required ports.

Machine generated alternative text:
(2) Info 
Instances 
Last updated 
less than a minute ago 
Connect 
Launch instances 
Instance state 
V 
@ Running Q Q 
@ Running Q Q 
All states v 
Instance type 
t2.micro 
t2.medium 
Q Find Instance by attribute or tag (case-sensitive) 
Name O V I Instance ID 
V 
Status check 
@ 2/2 checks passec 
@ 2/2 checks passec 
Sonarqube_Se... 
C) Jenkins Server 
i-Od36abe4753c73869 
i-0616834ff54ff3603 

Machine generated alternative text:
sg-OffOb47509e928e5b - Mine_SG 
Details 
Security group name 
Security group ID 
It sg-0ff0b47509e928e5b 
Mine SG 
Inbound rules count 
Owner 
It 970547368660 
6 Permission entries 
Description 
It Allow inbound traffic on 
required ports 
Outbound rules count 
1 Permission entry 
VPC associations - new 
Actions v 
vpc ID 
ypc- 
031 
- new 
Type 
SSH 
Tags 
Edit inbound rules 
Sharing 
V 
Inbound rules 
Outbound rules 
IP version 
IPv4 
IPv4 
IPv4 
IPv4 
IPv4 
IPv4 
V 
Inbound rules 
(6) 
Q Search 
Security group rule ID v 
sgr-08ö409dc1edd65725 
sgr-0f6c0d640460d8ö24 
sgr-034885195bd0c2f90 
sgr-0454b23bd320cef80 
sgr-Oadff4f359b7fa4be 
sgr-047d8ä5708926383 
Manage tags 
Protocol 
TCP 
TCP 
TCP 
TCP 
TCP 
TCP 
V 
Port range 
22 
8081 
443 
Custom TCP 
Custom TCP 
HTTP 
HTTPS 
Custom TCP 

Machine generated alternative text:
ecsServiceRole 
ecsTaskExecutionRole 
AWS Service: ecs 
AWS Service: ecs-tasks 

Machine generated alternative text:
Amazon Elastic Container Service 
(1) Info 
Clusters 
Q Search clusters 
Cluster 
my cluster 
Clusters 
V 
Tasks 
No tasks running 
V 
February 24, 
Container instances 
O EC2 
Last updated 
Create cluster 
2025 at 21:23 (UTC+5:30) 
V I CloudWatch monitoring 
@ Default 
V 
Services 

2️⃣ **Configuring Jenkins**

* Installed required Jenkins plugins (SonarQube Scanner, Docker Pipeline, etc.)
* Configured credentials for GitHub, DockerHub, and SonarQube.

Machine generated alternative text:
A Not secure 
AWS Management... 
Getting Started 
3.109.143.134:8080 
Home - Microsoft A... 
Azure DevOpsSum... 
GitHub 
WhatsApp 
Zoom 
O ChatGPT 
Finish update • 
» All Bookma 
Customize Jenkins 
Plugins extend Jenkins with additional features to support many different needs. 
Install suggested 
plugins 
Install plugins the Jenkins 
community finds most useful. 
Select plugins to 
install 
Select and install plugins most 
suitable for your needs. 

Machine generated alternative text:
Amazon Elastic Container Service Clusters my_cluster Services 
Last u pdated 
February 24, 2025 at 21:29 
CloudWatch monitoring 
Update cluster 
Delete cluster 
my_cluster 
Cluster overview 
ARN 
It arn:aws:ecs:ap-south-1:970547368660: 
cluster/my_cluster 
Status 
@Active 
Active 
Metrics 
ARN 
Scheduled tasks 
Registered container instances 
Running 
Delete service 
@ Default 
Tasks 
Pending 
Configuration 
Tags 
Manage tags 
Create 
Infrastructure 
Services 
Draining 
Services 
Tasks 
Services (1) Info 
Q Filter services by value 
Service name 
my_service 
Update 
V 
V 
Filter launch type 
Any launch type 
v Service... 
Status 
Filter service type 
Any service type 
Deployments and tasks 
Last deploy... 
In progress 
@Active 
REPLICA 
It arn:aws:ecs:ap-s 
0/1 Tasks running 

Machine generated alternative text:
Jenkins 
Dashboard 
+ New Item 
Build History 
@ Manage Jenkins 
My Views 
Build Queue 
No builds in the queue. 
Build Executor Status 
0/2 
w 
Name 
Santhu_project 
Last Success 
N/A 
Q 
Last Failure 
N/A 
@ Santhosh C v 
log out 
Add description 
Last Duration 
N/A 
s 
Icon: 
s 

3️⃣ **Integrating SonarQube for Code Analysis**

* Installed SonarQube and configured SonarQube server in Jenkins.
* Generated SonarQube token and integrated it into the pipeline.

Machine generated alternative text:
ubuntu@ip-172 
CONTAINER ID 
NAMES 
aa33dc75ec46 
sonarqube 
ubuntu@ip-172 
sonarqube 
ubuntu@ip-172 
CONTAINER ID 
aa33dc75ec46 
sudo 
IMAGE 
sona rqube : Its 
sudo 
sudo 
IMAGE 
NAMES 
sonarqube : Its 
docker ps -a 
COWAND 
" /opt/sona rqube/dockm" 
docker start sonarqube 
docker ps 
COWAND 
" /opt/sona rqube/dockm" 
CREATED 
2 hours 
CREATED 
2 hours 
ago 
ago 
STATUS 
Exited ( 130) 6 minutes ago 
PORTS 
STATUS 
Up 7 seconds 
PORTS 
sonar ube 
ubuntu@ip-172-31-1-24:. 

Machine generated alternative text:
A Not secure 
AWS Management... 
13.200.215.150:9000/projects/create 
Home - Microsoft A... Azure DevOpsSum... GitHub WhatsApp Zoom 
O ChatGPT 
Learn More 
Finish update 
All Bookmark 
Leam More 
Dismiss 
There's a new version of SonarQube available. upgrade to the latest active version to access new updates and features. 
sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration 
How do you want to create your project? 
Q Search tor projects 
Do you want to benefit from all ot SonarQube's teatures (like repository import and Pull Request decoration)? Create your project from your favorite Devops platform. 
First, you need to set up a Devops platform configuration. 
From Bitbucket Cloud 
Set up global configuration 
From GitHub 
Set up global configuration 
From GitLab 
Set up global configuration 
From Azure DevOps 
Set up global configuration 
From Bitbucket Server 
Set up global configuration 
Are you just testing or have an advanced use-case? Create a project manually. 
Manually 
Embedded database should be used for evaluation purposes onl 
The embedded database will not scale. it will not support uoaradina to newer versions 
Get tie most out of SonarQube! 
Take advantage ot the whole ecosystem by using SonarLmt, a tree 
IDE plugin that you find and fix issues earlier in your workflow 
Connect SonarLint to SonarQube to sync rule sets and issue states. 

Machine generated alternative text:
sonarqube 
Projects 
Issues 
A 
Tokens 
Rules 
Quality Profiles 
Quality Gates 
Administration 
Profile 
Security 
Q Search for projects__. 
Notifications 
Projects 
Administrator 
If you want to enforce security by not providing credentials of a real SonarQube user to run your code scan or to invoke web services, you can provide a User Token 
as a replacement ot the user login. This will increase the security of your installation by not letting your analysis user's password going through your network. 
Generate Tokens 
Name 
Enter Token Name 
Select Token Type 
Expires in 
30 days 
Generate 
Expiration 
May 25, 2025 
Revoke 
O New token "My access" has been created. Make sure you copy it now, you won't be able to see it again' 
Copy 
sqa ddc4ae26b6b9e2f567d72ee345d4ee88f1d14c71 
Last use 
Never 
Created 
February 24, 2025 
Name 
My_access 
Type 
Global 
Project 
Enter a new password 
All fields marked with * are required 
Old Password 

Machine generated alternative text:
Jenkins 
Dashboard 
Manage Jenkins 
Plugins 
Updates 
Available plugins 
Installed plugins 
Advanced setti ngs 
Download progress 
Plugins 
Released 
27 days ago 
29 days ago 
5 days 21 hr ago 
9 mo 3 days ago 
10 days ago 
@ Santhosh C v 
Install 
13 log out 
Q stage 
Install 
Name L 
SonarQube Scanner 2.18 
External SiteAooI Integrations Build Reports 
This plugin allows an easy integration of SonarQube, the open source platform for Continuous Inspection of code quality. 
Docker 1.9.0 
Cloud Providers Cluster Management docker 
This plugin integrates Jenkins with Docker 
Docker Pipeline 596.v3eS972b 46b e2 
pipeline DevOps Deplow-nent docker 
Build and use Docker containers from pipelines. 
docker-build-step 2.12 
Build Tools docker 
This plugin allows to add various docker commands to your job as build steps. 
Warning: This plugin version may not be safe to use. Please review the following security notices: 
CSRF vulnerability.ng_mjsÄpermission check 
Pipeline: Stage View 2.37 
user Interface 
Pipeline Stage View Plugin. 

* + Go to Manage Jenkins → Tools → SonarQube Scanner.

Machine generated alternative text:
Docker installations 
Add Docker 
Name 
docker 
e 
Install automatically 
Add Installer 
Add Docker 
Apply 
Jenkins 2.492.1 

Go to Manage Jenkins → Credentials → Global → Add Credentials

Machine generated alternative text:
(unrestricted) 
New credentials 
text 
GlnEMl c*iki items, etc:) 
Create 

Machine generated alternative text:
Global credentials (unrestricted) 
:redentials that should be available irrespective of domain specification to requirements matching. 
+ Add Credentials 
Description 
sonar-pass 
docker-pass 
con: 
s 
ID 
sonar-pass 
docker-pass 
Name 
sonar-pass 
(docker-pass) 
Kind 
Secret text 
Username with password 

Machine generated alternative text:
Dashboard 
Manage Jenkins 
Tools 
Edited 
Add SonarScanner for MSBuild 
SonarQube Scanner installations 
SonarQube Scanner installations 
Add SonarQube Scanner 
SonarQube Scanner 
Name 
SonarQube 
SONAR RUNNER HOME 
/opt/sonar-scanner 
Install automatically 
Add SonarQube Scanner 

## Machine generated alternative text: SonarQube servers If checked, job administrators will be able to inject a SonarQube server configuration as environment variables in the build. Environment variables SonarQube installations List of SonarQube installations Name SonarQube Sewer URL Default is http://localhost:9000 http://13.200.21S.1SO:9000/ Sewer authentication token SonarQube authentication token. Mandatory when anonymous access is disabled. sonar-pass + Add Advanced v Add SonarQube 📌 Jenkins Pipeline Script

pipeline {

agent any

environment{

SCANNER\_HOME= tool 'SonarQube'

}

stages {

stage('Gitcheckout') {

steps {

git branch: 'main', url: '<https://github.com/Santhunew/Movie-Date.git>'

}

}

stage('Trivy Filesystem scan') {

steps {

sh 'trivy fs --format table -o trivy-fs-report.html .'

}

}

stage('SonarQube') {

steps {

withSonarQubeEnv('SonarQube') {

sh '''

/opt/sonar-scanner/bin/sonar-scanner \

-Dsonar.projectKey=Movie\_date \

-Dsonar.projectName=Movie\_date \

-Dsonar.host.url=http://13.200.215.150:9000 \

-Dsonar.login=$SONAR\_AUTH\_TOKEN

'''

}

}

}

stage('Build & Tag Docker Image') {

steps {

withDockerRegistry(credentialsId: 'docker-pass', url: '<https://index.docker.io/v1/>') {

sh "docker build -t santhoshss7878/moviedate:v1 ."

}

}

}

stage('Push Docker Image') {

steps {

withDockerRegistry(credentialsId: 'docker-pass', url: '<https://index.docker.io/v1/>') {

sh "docker push santhoshss7878/moviedate:v1"

}

}

}

stage('Deploy to container') {

steps {

sh "docker run -d -p 8081:80 santhoshss7878/moviedate:v1"

}

}

}

}

Machine generated alternative text:
Santhu_project 
Stage View 
Average stage times: 
(full run time: —37s) 
01:11 
Changes 
Gitcheckout 
732ms 
732ms 
Trivy 
Filesystem 
662ms 
S62ms 
SonarQube 
14s 
14s 
Build & Tag 
Docker Image 
Push Docker 
Image 
18s 
Deploy to 
container 
577ms 
577ms 
SonarQube Quality Gate 
Movie date 
Passed 
server-side processing: 
Success 
Permalinks 
Last build (#31), 24 min ago 
Last stable build (#31), 24 min ago 
Last successful build (#31), 24 min ago 
Last failed build (#30), 26 min ago 
Last unsuccessful build (#30), 26 min ago 
Last completed build (#31), 24 min ago 

Machine generated alternative text:
Tent... 
Home - Microsoft A... Azure DevOpsSum... GitHub WhatsApp Zoom O ChatGPT cg prithvi mela shar... 
GIT interview questi... 
Login 
devops class 
e EPFO 
6 Minimal Academic... 
O There's a new version ot SonarQube available. upgrade to the latest active version to access new updates and teatures. 
sonarqubö Projects Issues Rules Quality Profiles Quality Gates Administration 
Learn More 
Last analysis of this Branch had 1 warning 
Reviewed 
New Code Smells 
Q Search for projects__. 
February 25, 2025 at 1:11 AM Version not provided 
Project Settings • 
project Intormation 
Reliability 
Security 
Security Review 
Maintainability 
Movie date 
main O 
Overview Issues Security Hotspots 
QUALITY GATE STATUS O 
Passed 
A" concitions passed. 
Measures 
Code Activity 
MEASURES 
New Code 
Since February 25, 2 
Started 48 minutes ago 
New Bugs 
Overall Code 
0 
New Vulnerabilities 
New Security Hotspots O 
Added Debt 
Duplications on 0 New Lines 

Machine generated alternative text:
santhoshss7878 
Name 
santhoshss7878/moviedate 
ew 
Introducin our new CEO Don Johnson - Read More -Y 
hub 
Q Search by repository name 
All content 
Visibility 
Public 
Create a repository 
Scout 
Inactive 
Last Pushed 
25 minutes ago 
Contains 

Machine generated alternative text:
santhoshss7878 / Repositories 
Using 0 of 1 private repositories. 
santhoshss7878/moviedate 
moviedate 
General 
Last pushed 25 minutes ago • Repository size: 68.8 MB 
Add a description 
Add a category 
Docker commands 
To push a new tag to this repository: 
docker push santhoshss7878/moviedate :tagname 
Public view 
General 
Tags 
Tags 
Image Management 
Webhooks 
Pulled 
Settings 
Pushed 
25 minutes 
BETA 
Builds 
Collaborators 
This repository contains 1 tag(s). 
Tag 
os 
Type 
Image 
less than 1 day 

Machine generated alternative text:
nextpage.html 
X 3.109.143.134:8081/yes.html 
e C Not secure 
3.109.143.134:8081/yes.html 
Hey, can we go to the cinema? 
Yes 
No 

Machine generated alternative text:
nextpage.html 
X 3.109.143.134:8081/finaIly.htmI X + 
A Not secure 
3.109.143.134:8081/finally.html 
Awesome! What time works best for you? 
Sun 
Mon 
Tue 
Wed 
Let's Fix a Date 
Thu Fri 
Sat 

Machine generated alternative text:
nextpage.html 
X 3.109.143.134:8081/nextpage.htm X 
e C Not secure 
3.109.143.134:8081/nextpage.html 
Fantastic! Let's meet then. I can't wait to catch up 
and have an awesome time together! 
WOOHOO!' 