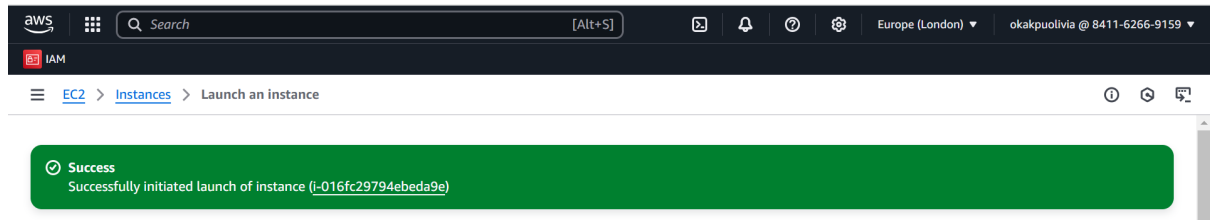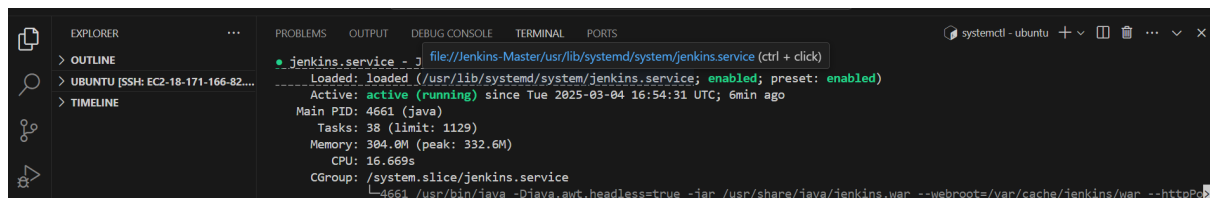# Automating CI/CD with Jenkins, Docker, ArgoCD, and AWS EKS

Jenkins-Master Instance launched in AWS Console
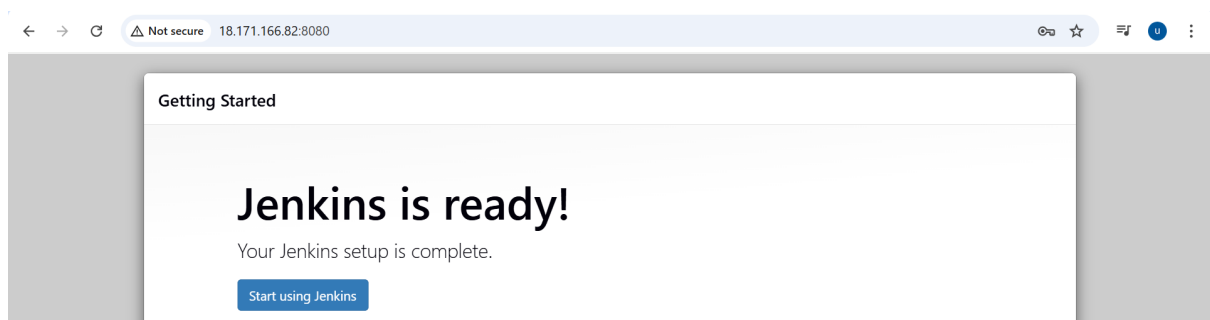

Jenkins is active and running on the Jenkins-Master Server

Jenkins-Master accessed on the web browser:8080

Jenkins setup complete

Jenkins-Agent Launched on Console

Jenkins-Agent Nodes integrated with the Jenkins-Master

Test Pipeline executed (Hello World)

The pipeline is executing on the Jenkins-Agent (Connection successful)

SonarQube active (running) on the CLI

Database and Credentials setup for SonarQube via CLI

```
$ .bashrc
$ .profile
≡ .sudo_as_admin_successful
≡ .wget-hsts

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS                                    bash - ubuntu  + ∨  ⊞  🗑  ...  ∧  ✕

Executing: /usr/lib/systemd/systemd-sysv-install enable postgresql
ubuntu@ip-172-31-7-119:~$ sudo systemctl enable postgresql
Synchronizing state of postgresql.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable postgresql
ubuntu@ip-172-31-7-119:~$ sudo passwd postgres
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-7-119:~$ su - postgres
Password:
postgres@ip-172-31-7-119:~$
postgres@ip-172-31-7-119:~$ createuser sonar
postgres@ip-172-31-7-119:~$ psql
psql (17.4 (Ubuntu 17.4-1.pgdg24.04+2))
Type "help" for help.

postgres=# ALTER USER sonar WITH ENCRYPTED password 'sonar';
ALTER ROLE
postgres=#  CREATE DATABASE sonarqube OWNER sonar;
CREATE DATABASE
postgres=# grant all privileges on DATABASE sonarqube to sonar;
GRANT
postgres=# \q
postgres@ip-172-31-7-119:~$ exit
logout
ubuntu@ip-172-31-7-119:~$

> TIMELINE
SSH: ec2-3-8-232-87.eu-west-2.compute.am...    ⊗ 0 ⚠ 0    🚩 0
```

SonarQube accessed and logged in via port 9000 through the web browser
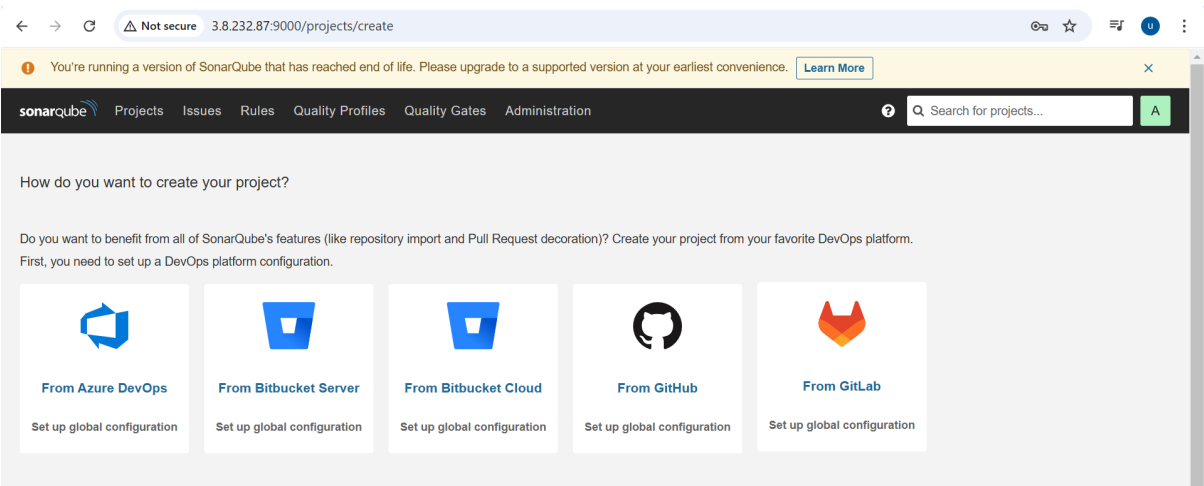
SonarQube Analysis ran successfully

register-app-1-ci - Stage View

	Declarative: Checkout SCM	Declarative: Tool Install	Cleanup Workspace	Checkout from SCM	Build Application	Test Application	SonarQube Analysis
Average stage times: (full run time: ~44s)	3s	353ms	670ms	1s	13s	6s	26s
#4 02:48 2	5s	396ms	764ms	2s	10s	6s	26s
#2 17:55 No Changes	780ms	310ms	576ms	1s	16s	6s	

Quality gate stage ran successfully

Dashboard > register-app-1-ci > #5

```
[Pipeline] {
[Pipeline] waitForQualityGate
Checking status of SonarQube task 'AZVumQVTnhYDKoAi4cbT' on server 'sonarqube-server'
SonarQube task 'AZVumQVTnhYDKoAi4cbT' status is 'IN_PROGRESS'
SonarQube task 'AZVumQVTnhYDKoAi4cbT' status is 'SUCCESS'
SonarQube task 'AZVumQVTnhYDKoAi4cbT' completed. Quality gate is 'OK'
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

SonarQube Dashboard
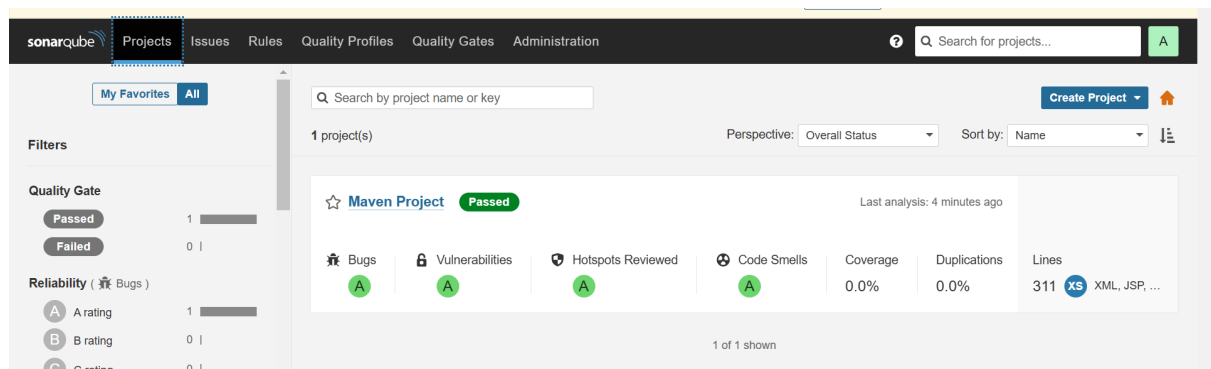
Docker installation was successful
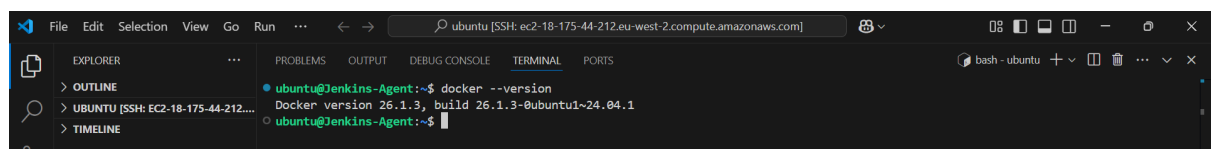
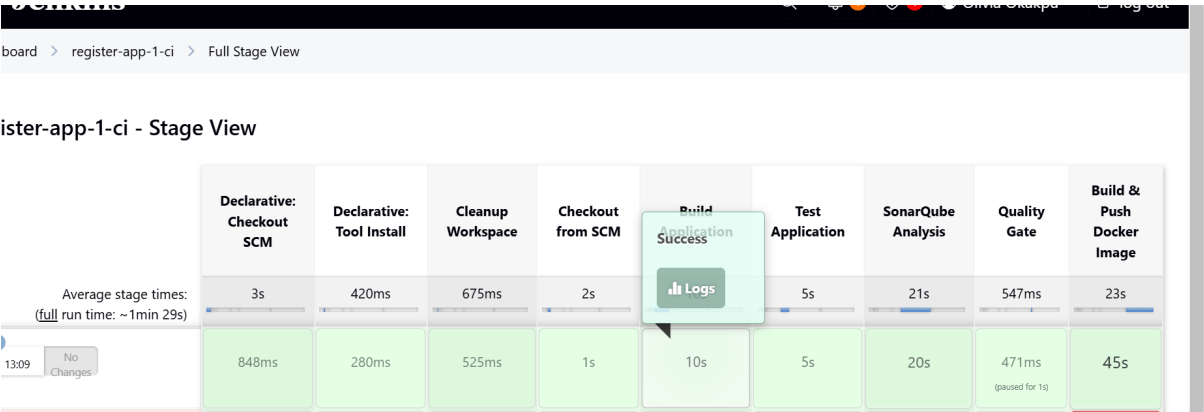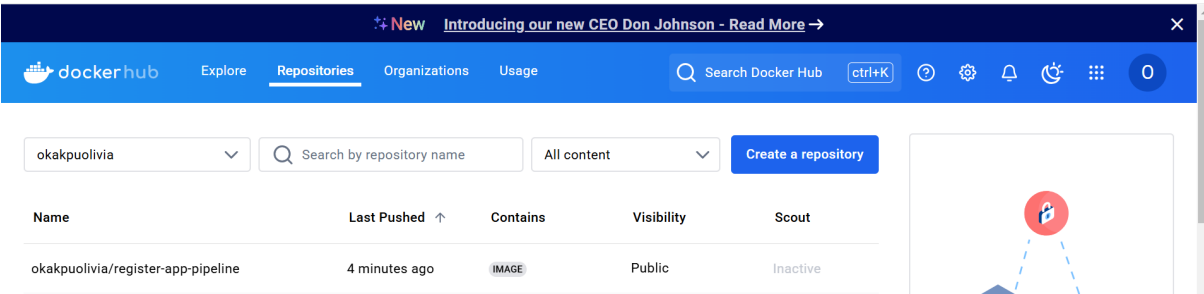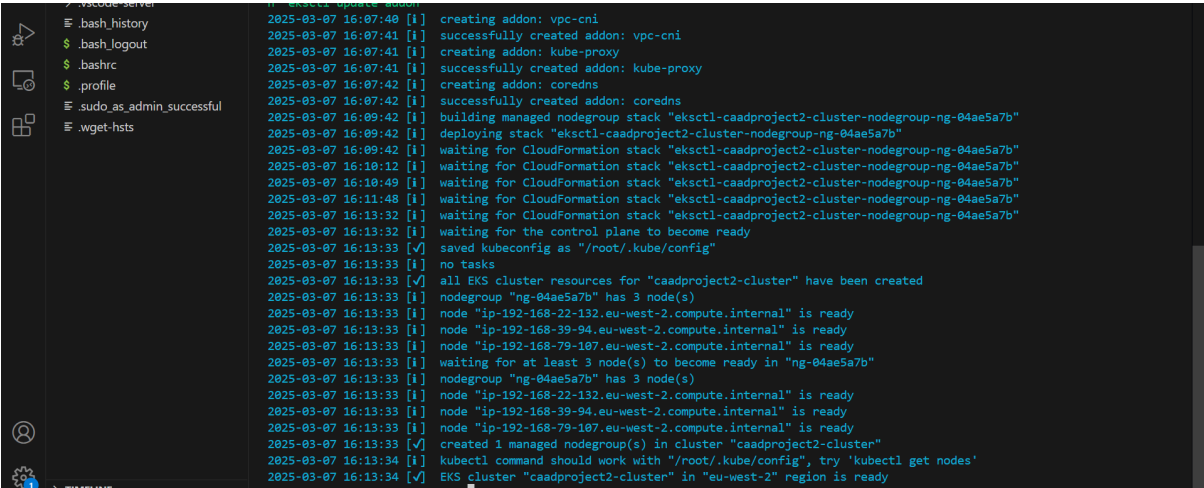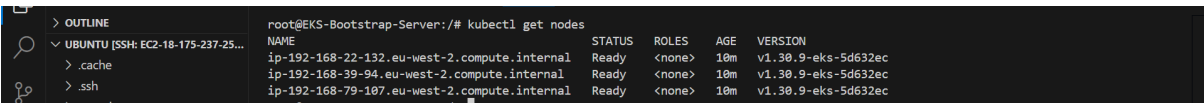# Build and Push Docker Image stage ran successfully

Pipeline success- Image pushed to DockerHub

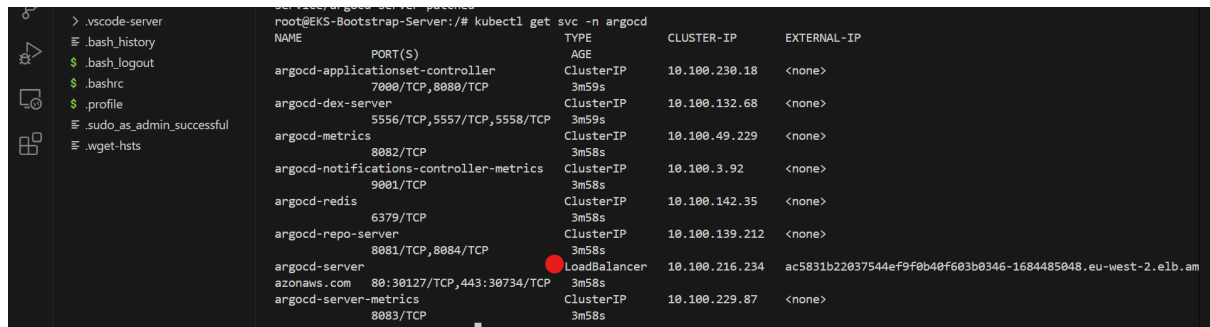# Created EKS Cluster and nodes on the CLI
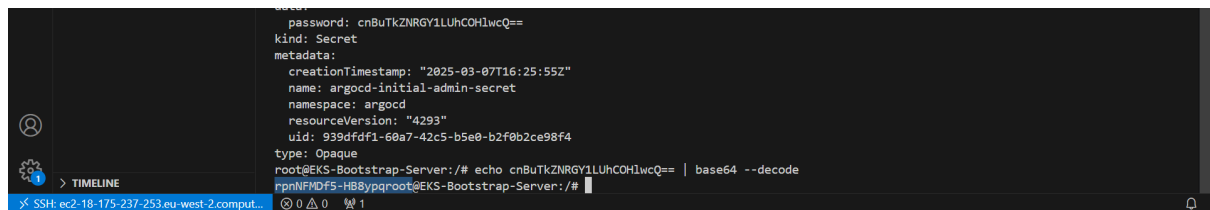

Nodes showing on the CLI

Load Balancer in AgroCD namespace
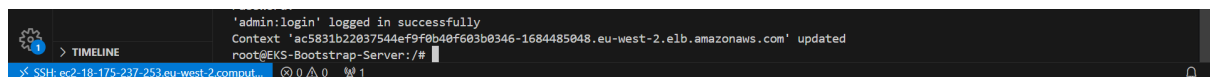

```
                         service/argocd-server-patched
 > .vscode-server        root@EKS-Bootstrap-Server:/# kubectl get svc -n argocd
 ≡ .bash_history         NAME                                      TYPE           CLUSTER-IP       EXTERNAL-IP
 $ .bash_logout                              PORT(S)                              AGE
 $ .bashrc               argocd-applicationset-controller          ClusterIP      10.100.230.18    <none>
 $ .profile                                  7000/TCP,8080/TCP                    3m59s
 ≡ .sudo_as_admin_successful  argocd-dex-server                    ClusterIP      10.100.132.68    <none>
 ≡ .wget-hsts                                5556/TCP,5557/TCP,5558/TCP  3m59s
                         argocd-metrics                            ClusterIP      10.100.49.229    <none>
                                             8082/TCP                             3m58s
                         argocd-notifications-controller-metrics   ClusterIP      10.100.3.92      <none>
                                             9001/TCP                             3m58s
                         argocd-redis                              ClusterIP      10.100.142.35    <none>
                                             6379/TCP                             3m58s
                         argocd-repo-server                        ClusterIP      10.100.139.212   <none>
                                             8081/TCP,8084/TCP                    3m58s
                         argocd-server                             LoadBalancer   10.100.216.234   ac5831b22037544ef9f0b40f603b0346-1684485048.eu-west-2.elb.am
                         azonaws.com  80:30127/TCP,443:30734/TCP    3m58s
                         argocd-server-metrics                     ClusterIP      10.100.229.87    <none>
                                             8083/TCP                             3m58s
```

## AgroCD login credentials decoded

```
      password: cnBuTkZNRGY1LUhCOHlwcQ==
kind: Secret
metadata:
    creationTimestamp: "2025-03-07T16:25:55Z"
    name: argocd-initial-admin-secret
    namespace: argocd
    resourceVersion: "4293"
    uid: 939dfdf1-60a7-42c5-b5e0-b2f0b2ce98f4
type: Opaque
root@EKS-Bootstrap-Server:/# echo cnBuTkZNRGY1LUhCOHlwcQ== | base64 --decode
rpnNFMDf5-HB8ypqroot@EKS-Bootstrap-Server:/#
```

`SSH: ec2-18-175-237-253.eu-west-2.comput...` ⊗0 ⚠0 ⚡1

Login success on the CLI


```
        password:
        'admin:login' logged in successfully
Context 'ac5831b22037544ef9f0b40f603b0346-1684485048.eu-west-2.elb.amazonaws.com' updated
root@EKS-Bootstrap-Server:/#
```
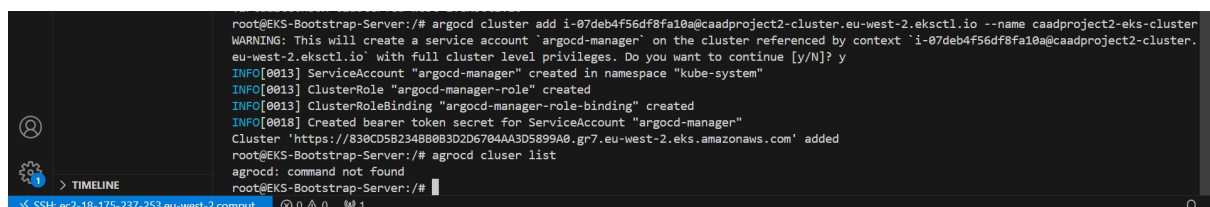
`SSH: ec2-18-175-237-253.eu-west-2.comput...` ⊗0 ⚠0 ⚡1
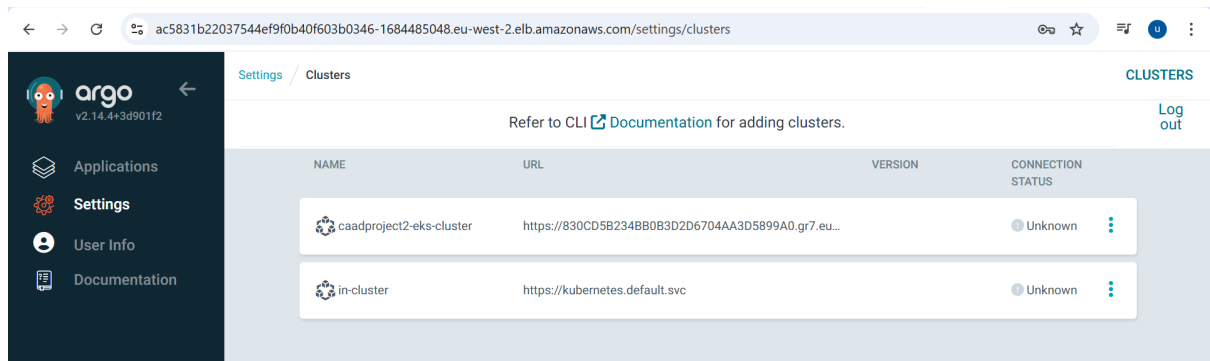
Accessed AgroCD using load balancer URL
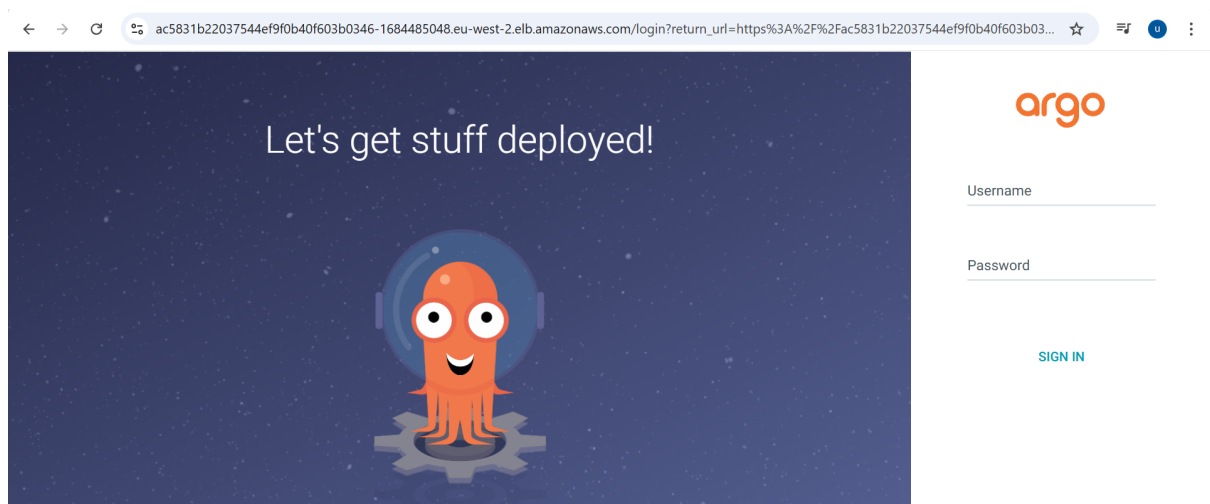
EKS cluster added to AgroCD via CLI


```
root@EKS-Bootstrap-Server:/# argocd cluster add i-07deb4f56df8fa10a@caadproject2-cluster.eu-west-2.eksctl.io --name caadproject2-eks-cluster
WARNING: This will create a service account `argocd-manager` on the cluster referenced by context `i-07deb4f56df8fa10a@caadproject2-cluster.
eu-west-2.eksctl.io` with full cluster level privileges. Do you want to continue [y/N]? y
INFO[0013] ServiceAccount "argocd-manager" created in namespace "kube-system"
INFO[0013] ClusterRole "argocd-manager-role" created
INFO[0013] ClusterRoleBinding "argocd-manager-role-binding" created
INFO[0018] Created bearer token secret for ServiceAccount "argocd-manager"
Cluster 'https://830CD5B234BB0B3D2D6704AA3D5899A0.gr7.eu-west-2.eks.amazonaws.com' added
root@EKS-Bootstrap-Server:/# agrocd cluser list
agrocd: command not found
root@EKS-Bootstrap-Server:/#
```
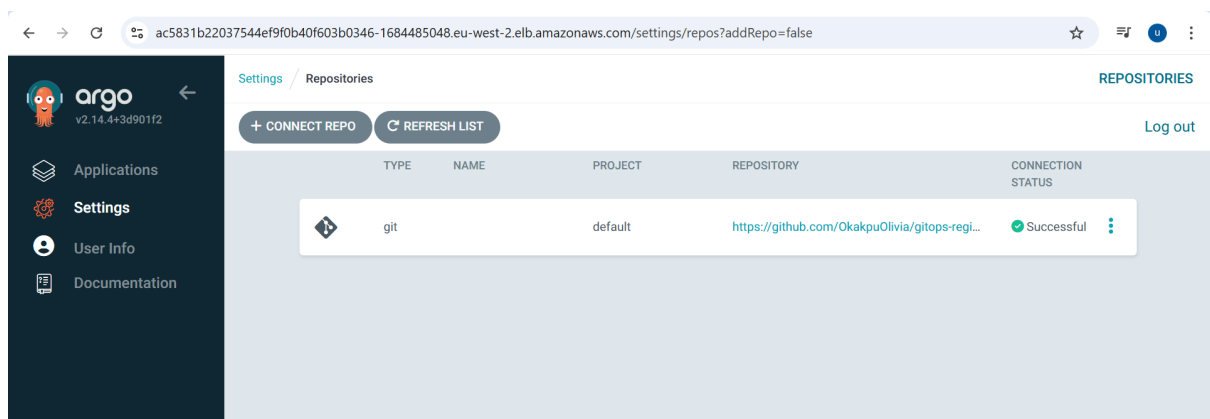
`SSH: ec2-18-175-237-253.eu-west-2.comput...` ⊗0 ⚠0 ⚡1

Cluster successfully added and visible on the AgroCD dashboard
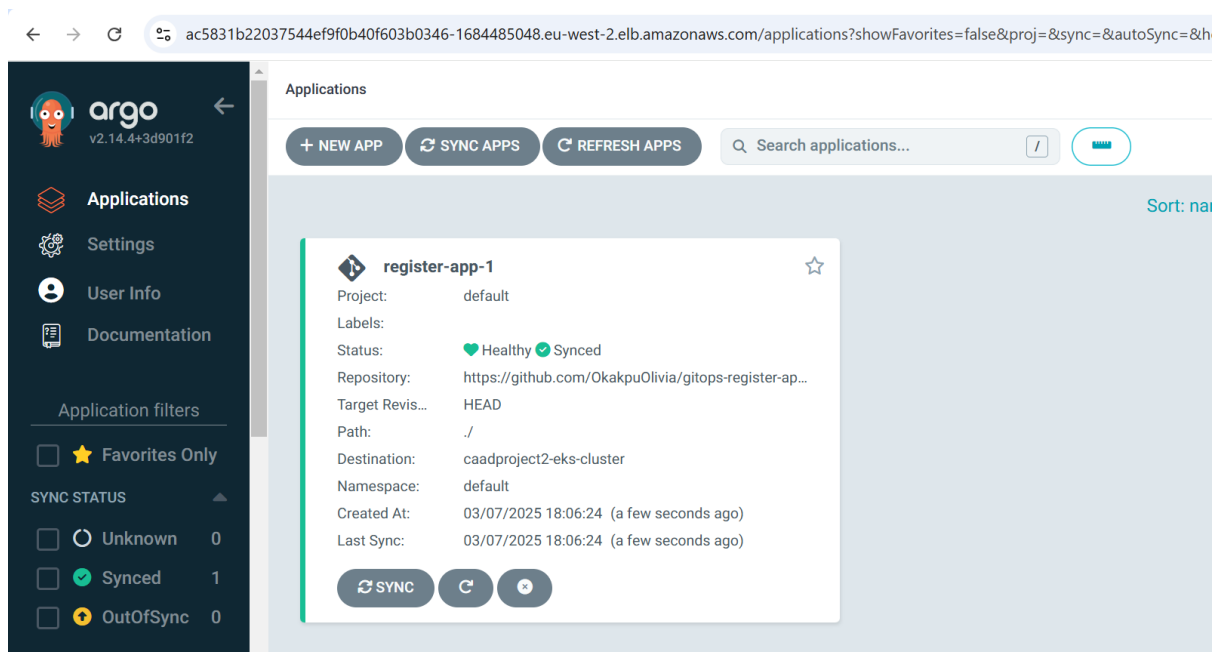
Github repository successfully connected

Application created on EKS cluster

Kubernetes External DNS for Load Balancer

Apache Tomcat accessed using Load Balancer DNS:8080

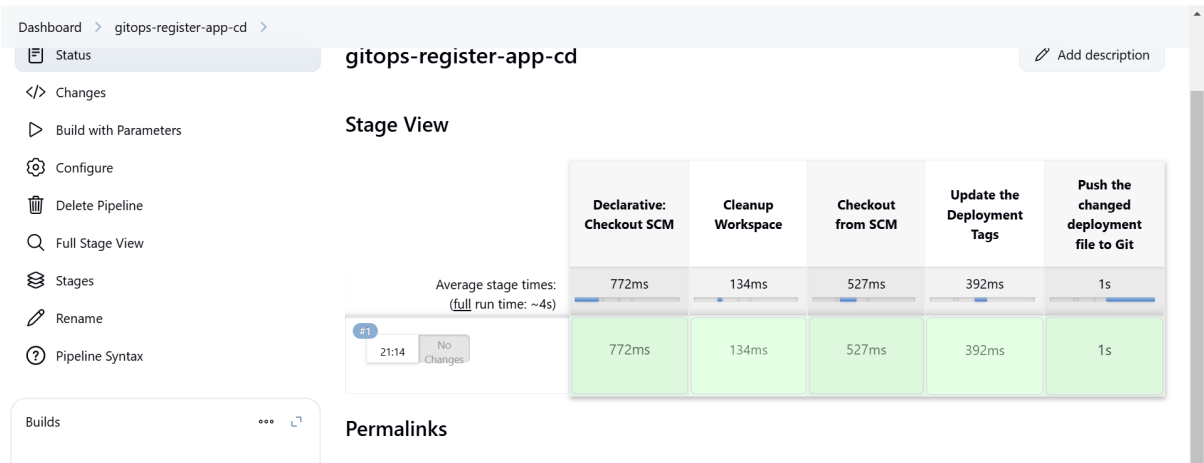Application accessed using Load Balancer DNS:8080/webapp

Health and sync status are both confirmed as OK in AgroCD app
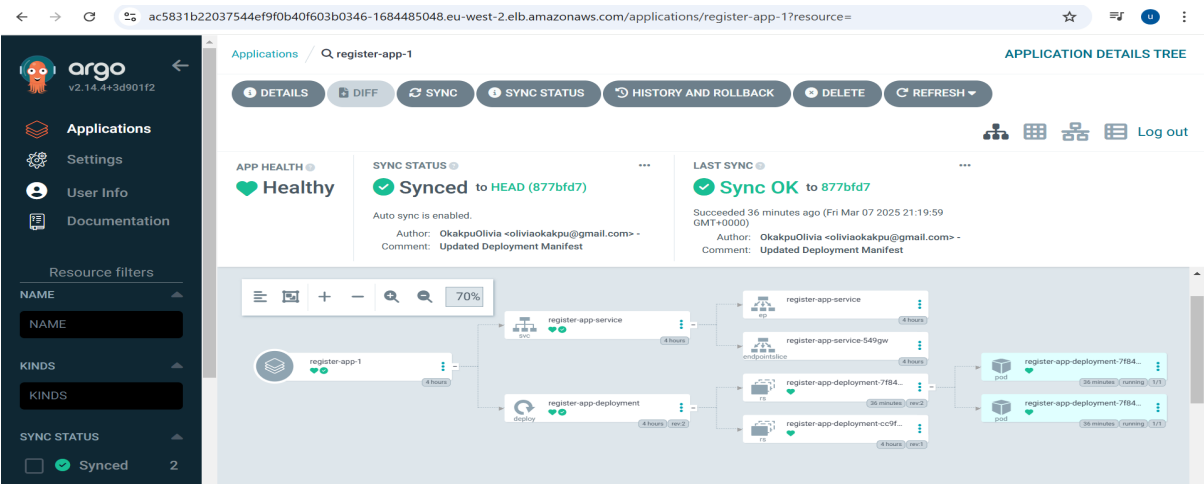
CI trigger for (gitops-resgister-app) CD job was successful
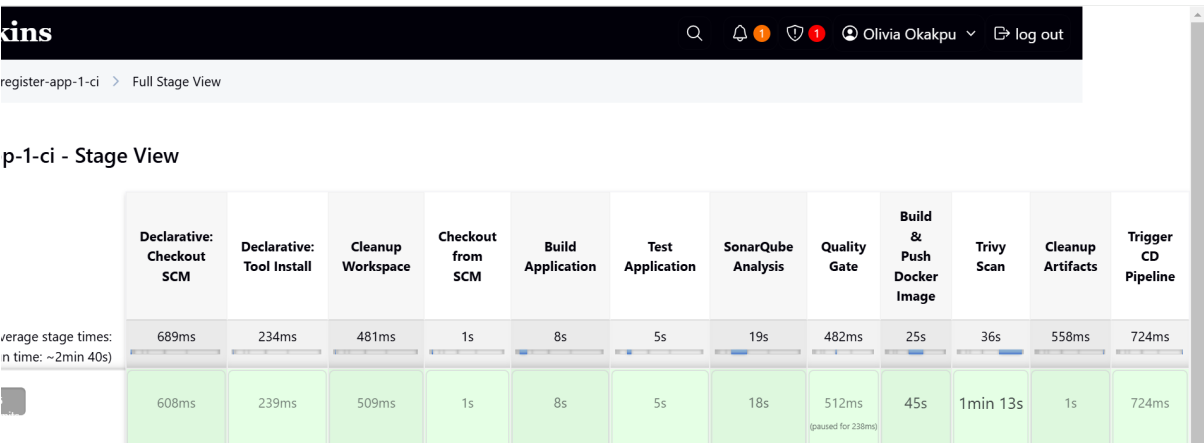
The CD trigger was successful, and the pipeline executed without issues

Verified the latest version of the image on DockerHub to confirm the update after the successful CI/CD execution

Instances used in executing the project

Github Repository

https://github.com/OkakpuOlivia/register-app-1.git

https://github.com/OkakpuOlivia/gitops-register-app.git