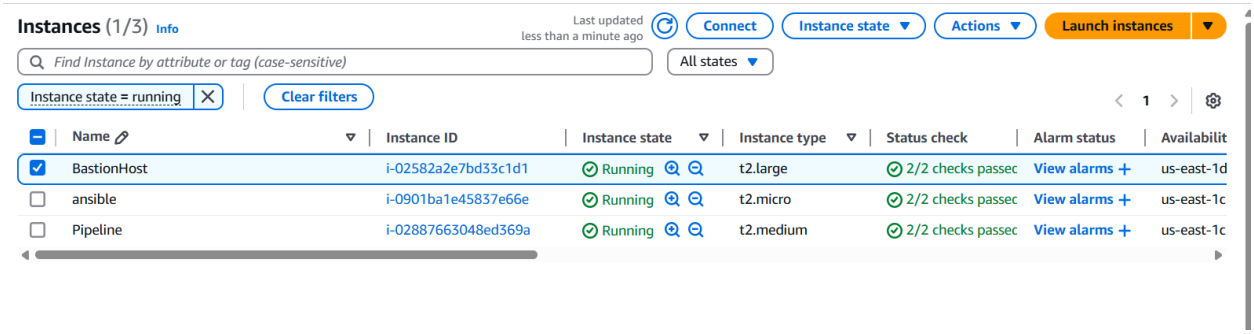
Assessment Overview

Created Three Servers: Ansible Master, Bastion Host (Slave) and Pipeline (Jenkins) (Slave).



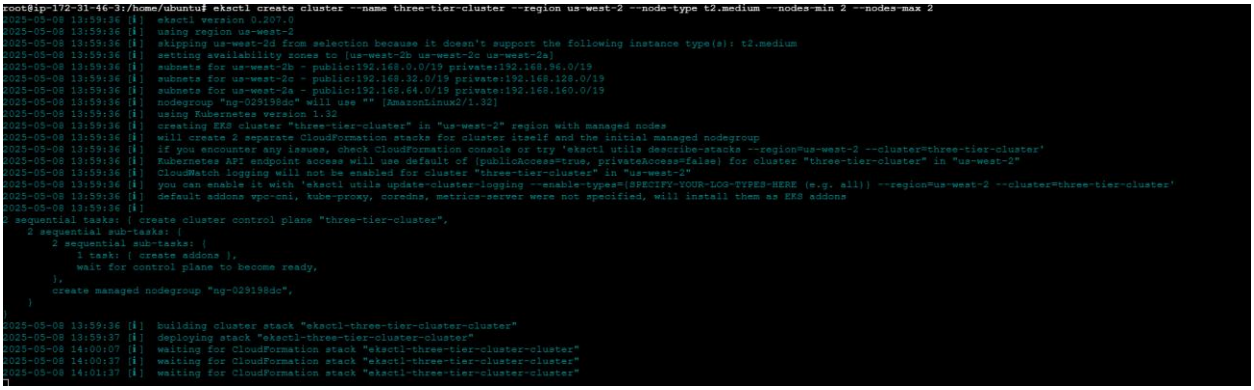
All the installation is done through Ansible.

1. Created a Bastion Host with required configurations installed using Ansible making it only source of contact with Kubernetes Cluster present in Private Subnet.

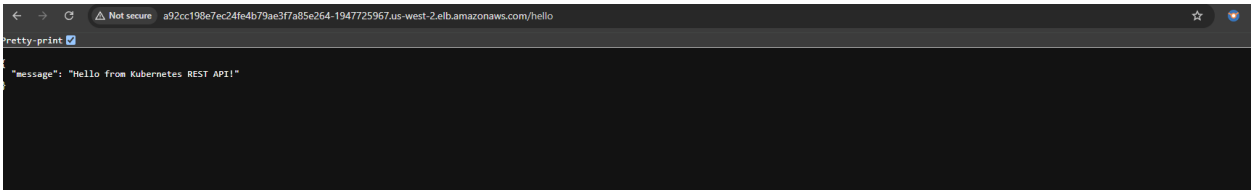
```
ubuntu@ip-172-31-46-3:~$ kubectl version --client
Client Version: v1.31.0
Kustomize Version: v5.4.2
ubuntu@ip-172-31-46-3:~$
```

```
[root@ip-172-31-19-160 bastion-playbooks]# vi main.yml
[root@ip-172-31-19-160 bastion-playbooks]# ansible-playbook -i inventory.ini main.yml

PLAY [bastionhost] ************************************************************************************************************************************************************

TASK [Gathering Facts] ********************************************************************************************************************************************************
ok: [ubuntu@54.172.91.255]

TASK [eksctl : Copy bash script to server] ************************************************************************************************************************************
changed: [ubuntu@54.172.91.255]

TASK [eksctl : execute bash script on server] *********************************************************************************************************************************
changed: [ubuntu@54.172.91.255]

TASK [prerequisits : install basic packages] **********************************************************************************************************************************
ok: [ubuntu@54.172.91.255]

TASK [prerequisits : change permission for /opt] ******************************************************************************************************************************
ok: [ubuntu@54.172.91.255]

TASK [kubectl : Copy bash script to server] ***********************************************************************************************************************************
ok: [ubuntu@54.172.91.255]

TASK [kubectl : execute bash script on server] ********************************************************************************************************************************
changed: [ubuntu@54.172.91.255]

TASK [kubectl : Installing Skaffold] ******************************************************************************************************************************************
changed: [ubuntu@54.172.91.255]

TASK [helm : install helm from direct url] ************************************************************************************************************************************
changed: [ubuntu@54.172.91.255]
```

Created Kubernetes Cluster with nginx Controller

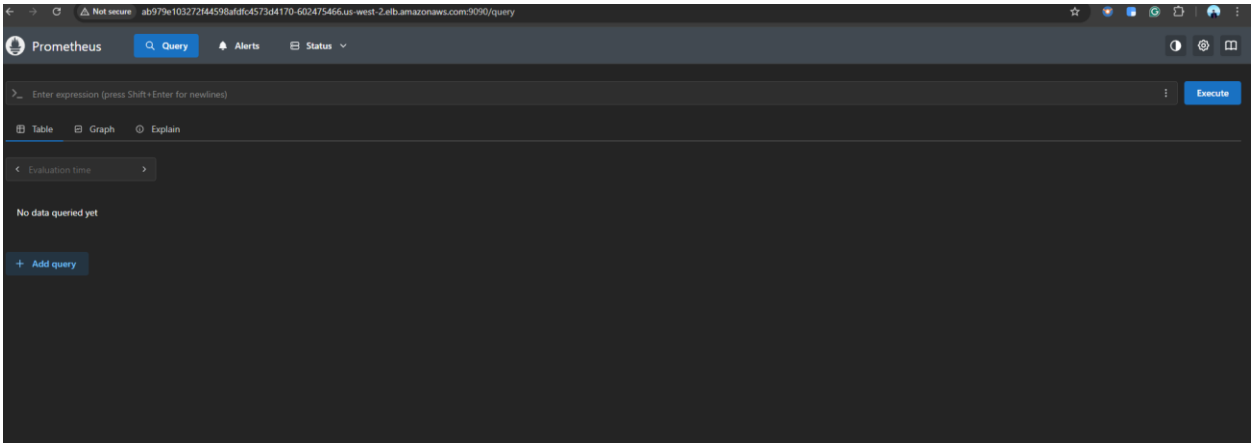


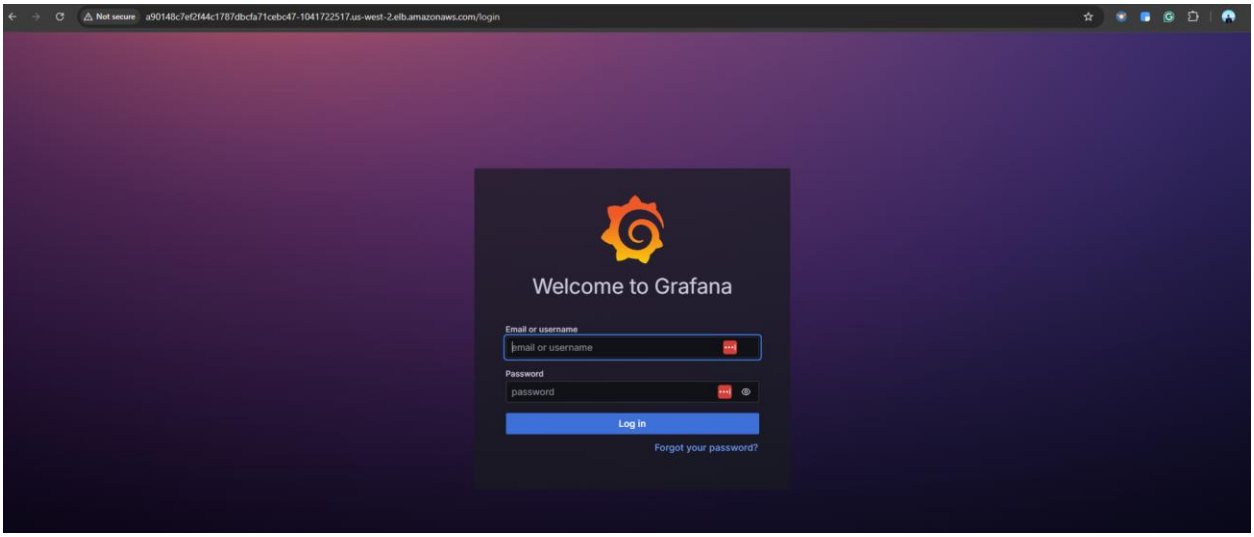

```
root@ip-172-31-46-3:/home/ubuntu/Build-A-High-Availability-System-Design-Assessment/K8s Manifest - Hot# kubectl get pods -n ingress-nginx
NAME                                        READY   STATUS    RESTARTS   AGE
ingress-nginx-controller-6885cfc548-pwnwp   1/1     Running   0          27s
root@ip-172-31-46-3:/home/ubuntu/Build-A-High-Availability-System-Design-Assessment/K8s Manifest - Hot# kubectl get ingress
NAME              CLASS   HOSTS   ADDRESS                                                                   PORTS   AGE
backend-ingress   nginx   *       a109c25fa162c4bb8ad2750a1049639a-1514297137.us-west-2.elb.amazonaws.com   80      36m
```



Prometheus and Grafana Setup using Helm:

```
    meta.helm.sh/release-namespace: prometheus
  creationTimestamp: "2025-05-08T14:50:36Z"
  labels:
    app: kube-prometheus-stack-prometheus
    app.kubernetes.io/instance: stable
    app.kubernetes.io/managed-by: Helm
    app.kubernetes.io/part-of: kube-prometheus-stack
    app.kubernetes.io/version: 72.1.1
    chart: kube-prometheus-stack-72.1.1
    heritage: Helm
    release: stable
    self-monitor: "true"
  name: stable-kube-prometheus-sta-prometheus
  namespace: prometheus
  resourceVersion: "8395"
  uid: b979e103-272f-4459-8afd-fc4573d4170c
pec:
  clusterIP: 10.100.238.69
  clusterIPs:
  - 10.100.238.69
  internalTrafficPolicy: Cluster
  ipFamilies:
  - IPv4
  ipFamilyPolicy: SingleStack
  ports:
  - name: http-web
    port: 9090
    protocol: TCP
    targetPort: 9090
  - appProtocol: http
    name: reloader-web
    port: 8080
    protocol: TCP
    targetPort: reloader-web
  selector:
    app.kubernetes.io/name: prometheus
    operator.prometheus.io/name: stable-kube-prometheus-sta-prometheus
  sessionAffinity: None
  type: LoadBalancer
tatus:
  loadBalancer: {}
```

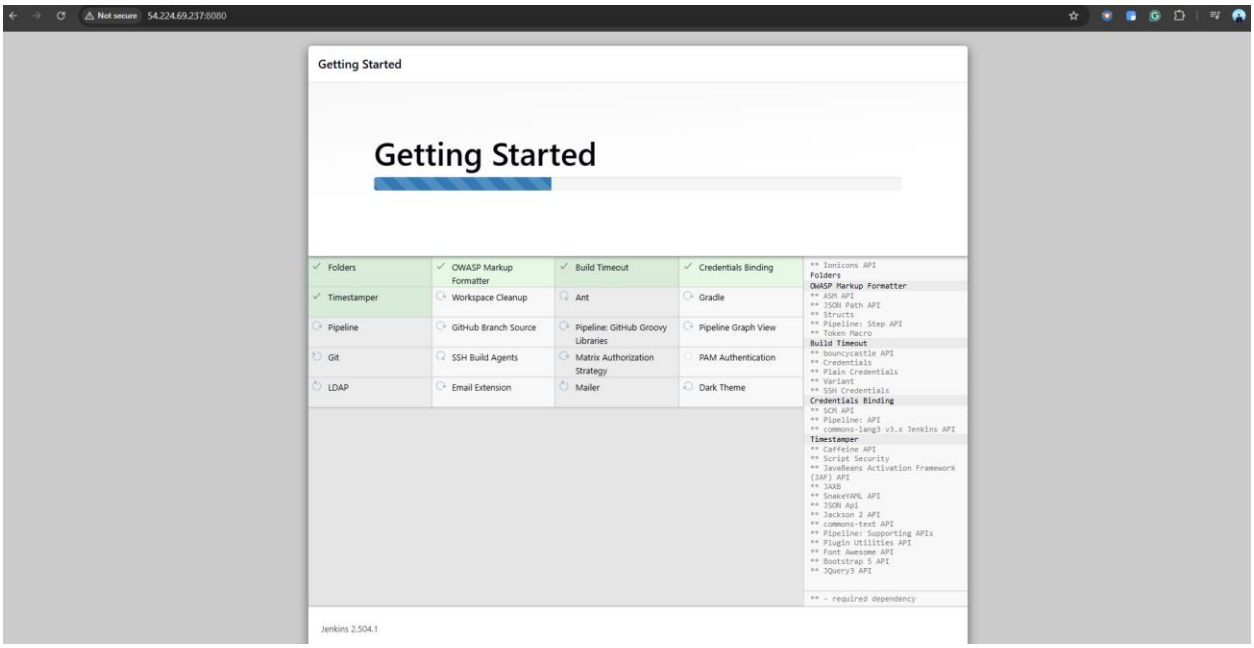


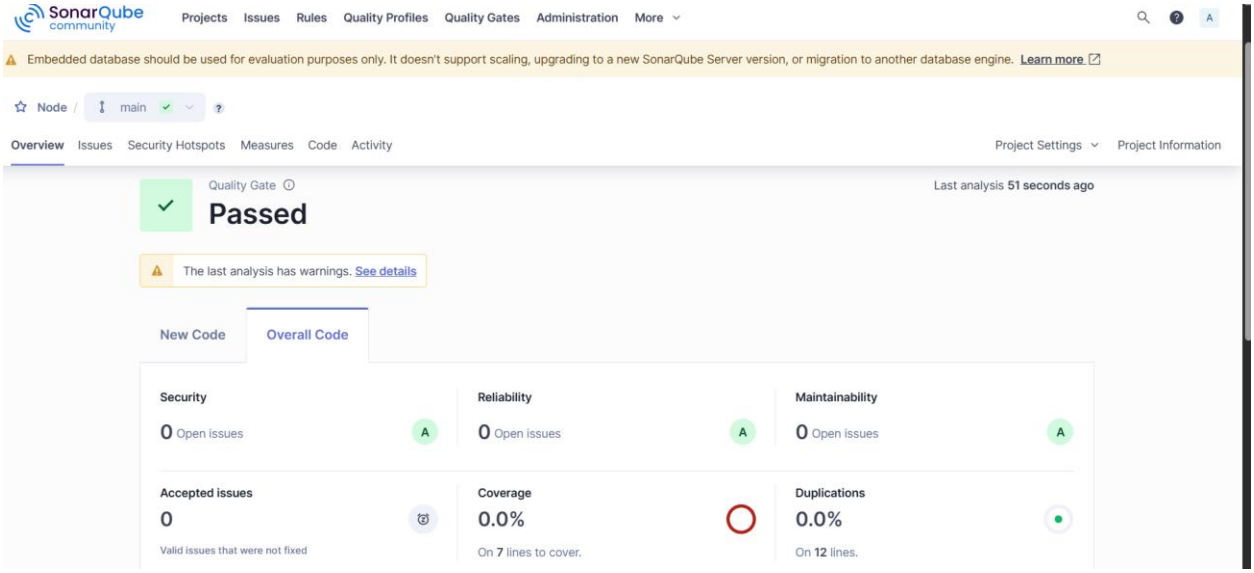

Not secure
a90148c7ef2f44c1787dbcfa71cebc47-1041722517.us-west-2.elb.amazonaws.com/login
Welcome to Grafana
Email or username
email or username
Password
password
Log in
Forgot your password?


Grafana
Home
Bookmarks
Starred
Dashboards
Explore
Drilldown
New!
Alerting
Connections
Administration
Home › Dashboards › Kubernetes / Views / Pods
Search or jump to...
Add
Settings
Exit edit
Save dashboard
datasource Prometheus
cluster
namespace default
pod All
resolution 30s
job kube-state-metrics
terraform
oncall
Last 1 hour
Refresh 30s
Kubernetes (2 panels)
Network
Network - Bandwidth
256 B/s
128 B/s
0 B/s
-128 B/s
Received
Transmitted
Network - Packets Rate
2 p/s
1 p/s
0 p/s
-1 p/s
Network - Packets Dropped
100 p/s
80 p/s
60 p/s
40 p/s
20 p/s
0 p/s
Network - Errors
10:25
10:30
10:35
10:40
10:45
10:50
10:55
11:00
11:05
11:10
11:15
11:20

Installing Jenkins and SonarQube for pipeline:

```
TASK [Gathering Facts] *********************************************************
[WARNING]: Platform linux on host ec2-user@54.224.69.237 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of t
path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [ec2-user@54.224.69.237]

TASK [jenkins : Ensure Java is installed (Amazon Linux 2)] *********************
ok: [ec2-user@54.224.69.237]

TASK [jenkins : Add Jenkins repo] **********************************************
ok: [ec2-user@54.224.69.237]

TASK [jenkins : Import Jenkins GPG key] ****************************************
ok: [ec2-user@54.224.69.237]

TASK [jenkins : Install Jenkins] ***********************************************
ok: [ec2-user@54.224.69.237]

TASK [jenkins : Enable and start Jenkins service] ******************************
ok: [ec2-user@54.224.69.237]

TASK [SonarQube : Install Docker] **********************************************
changed: [ec2-user@54.224.69.237]

TASK [SonarQube : Ensure Docker service is running] ****************************
changed: [ec2-user@54.224.69.237]

TASK [SonarQube : Add ec2-user to docker group] ********************************
changed: [ec2-user@54.224.69.237]

TASK [SonarQube : Pull SonarQube Docker image] *********************************
changed: [ec2-user@54.224.69.237]

TASK [SonarQube : Run SonarQube container] *************************************
changed: [ec2-user@54.224.69.237]

PLAY RECAP *********************************************************************
ec2-user@54.224.69.237     : ok=11   changed=5    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```




SonarQube community
Projects
Issues
Rules
Quality Profiles
Quality Gates
Administration
More
A
Embedded database should be used for evaluation purposes only. It doesn't support scaling, upgrading to a new SonarQube Server version, or migration to another database engine. Learn more
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Code
Activity
Project Settings
Project Information
Quality Gate
Passed
Last analysis 51 seconds ago
The last analysis has warnings. See details
New Code
Overall Code
Security
0 Open issues
A
Reliability
0 Open issues
A
Maintainability
0 Open issues
A
Accepted issues
0
Valid issues that were not fixed
Coverage
0.0%
On 7 lines to cover.
Duplications
0.0%
On 12 lines.