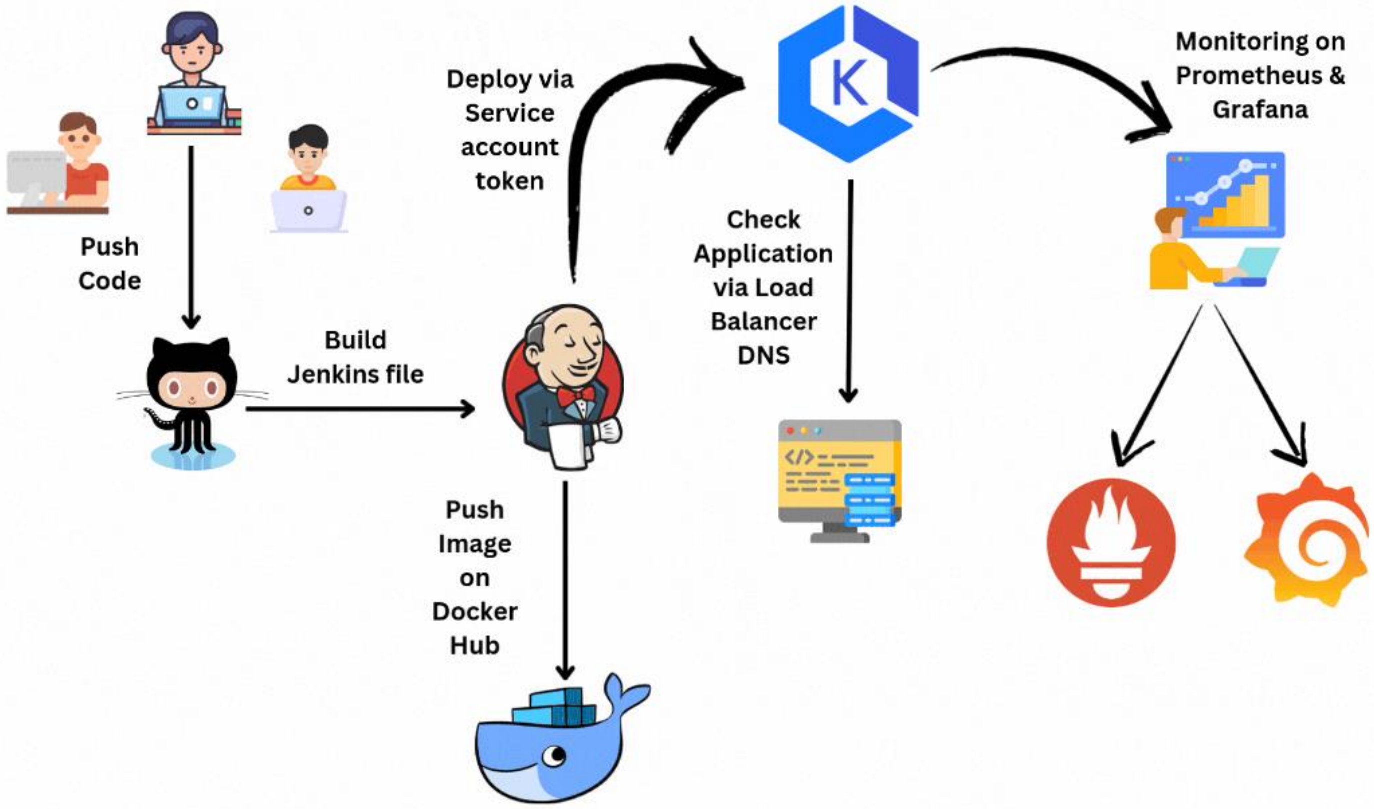
PROJECT

End-to-End E-Commerce Microservices Built with AWS EKS, Jenkins, Docker, and Kubernetes

Tool Use

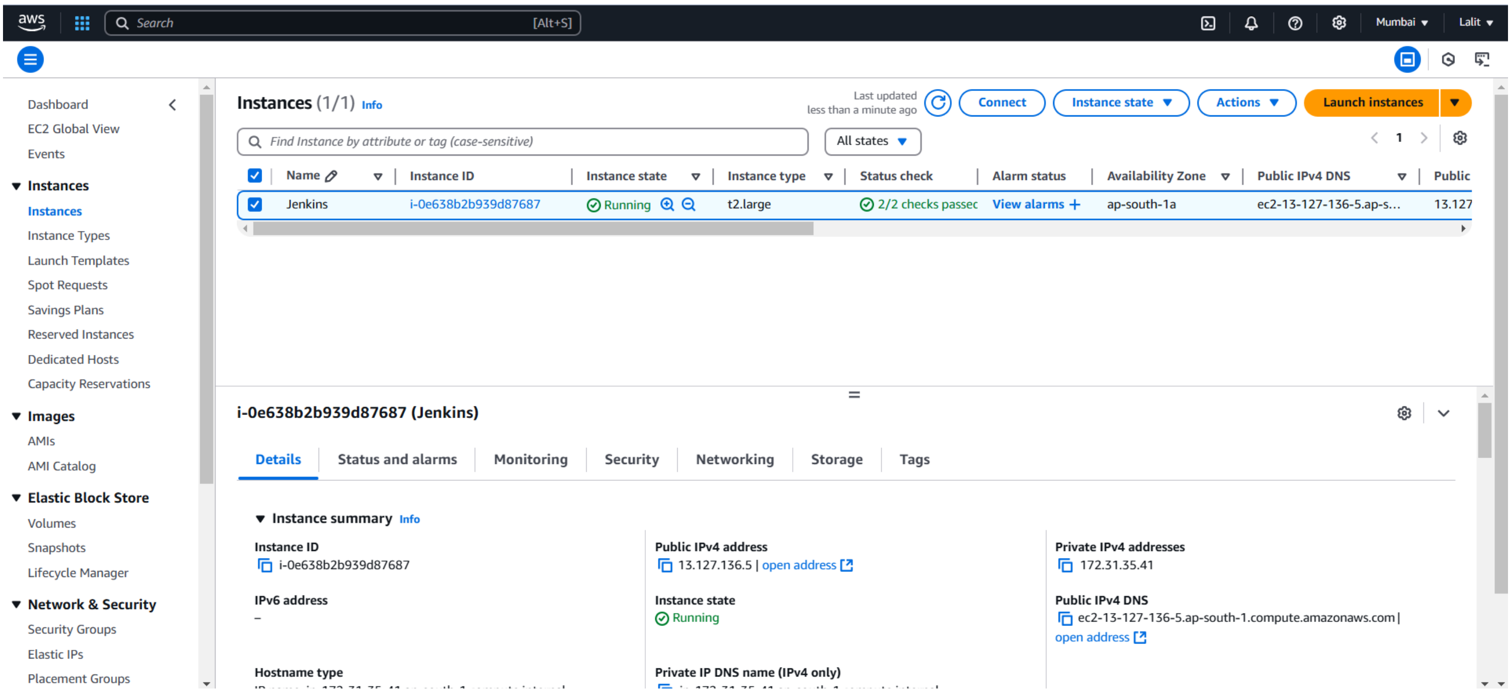
1. **AWS Console:** Used to manage servers and resources efficiently.
2. **AWS EKS (Elastic Kubernetes Service):** Facilitates the management of Kubernetes clusters on AWS.
3. **IAM (Identity and Access Management):** Manages user permissions and access to AWS resources.
4. **Jenkins:** Automates the CI/CD pipeline and application deployments.
5. **GitHub:** Hosts code repositories and provides version control.
6. **Docker:** Enables containerization of applications for simplified deployment and scaling.
7. **Docker Hub:** Serves as a platform to store and manage Docker images.
8. **kubectl:** A command-line tool for interacting with Kubernetes clusters.
9. **eksctl:** Simplifies the creation and management of EKS clusters on AWS.
10. **Kubernetes:** An orchestration platform for automating the deployment, scaling, and management of containerized applications.
11. **Prometheus & Grafana:** Tools used for monitoring and visualizing system metrics.



Push Code
Build Jenkins file
Deploy via Service account token
Push Image on Docker Hub
Check Application via Load Balancer DNS
Monitoring on Prometheus & Grafana

Step 1: Setting Up Your EC2 Instance

- **Storage:** Attach a 30 GB EBS volume.
- **Instance Type:** t2.large for better performance with 2 vCPUs and 8 GB RAM.
- **IAM Role:** Assign a role with full access to manage AWS resources.



Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public
Jenkins	i-0e638b2b939d87687	Running	t2.large	2/2 checks passec	View alarms +	ap-south-1a	ec2-13-127-136-5.ap-s...	13.127

i-0e638b2b939d87687 (Jenkins)

Instance ID
i-0e638b2b939d87687

Public IPv4 address
13.127.136.5 | open address

Private IPv4 addresses
172.31.35.41

IPv6 address
–

Instance state
Running

Public IPv4 DNS
ec2-13-127-136-5.ap-south-1.compute.amazonaws.com | open address

Hostname type

Private IP DNS name (IPv4 only)

Step 2: Install AWS CLI, kubectl, and eksctl

AWS CLI:

- **Installation:**

```
 curl "https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o
"awscliv2.zip"
sudo apt install unzip
unzip awscliv2.zip
sudo ./aws/install
```

kubectl:

- **Installation:**

```
curl -o kubectl https://amazon-eks.s3.us-west-2.amazonaws.com/1.19.6/2021-01-05/bin/linux/amd64/kubectl

chmod +x ./kubectl

sudo mv ./kubectl /usr/local/bin

kubectl version --short –client
```

eksctl:

- **Installation:**

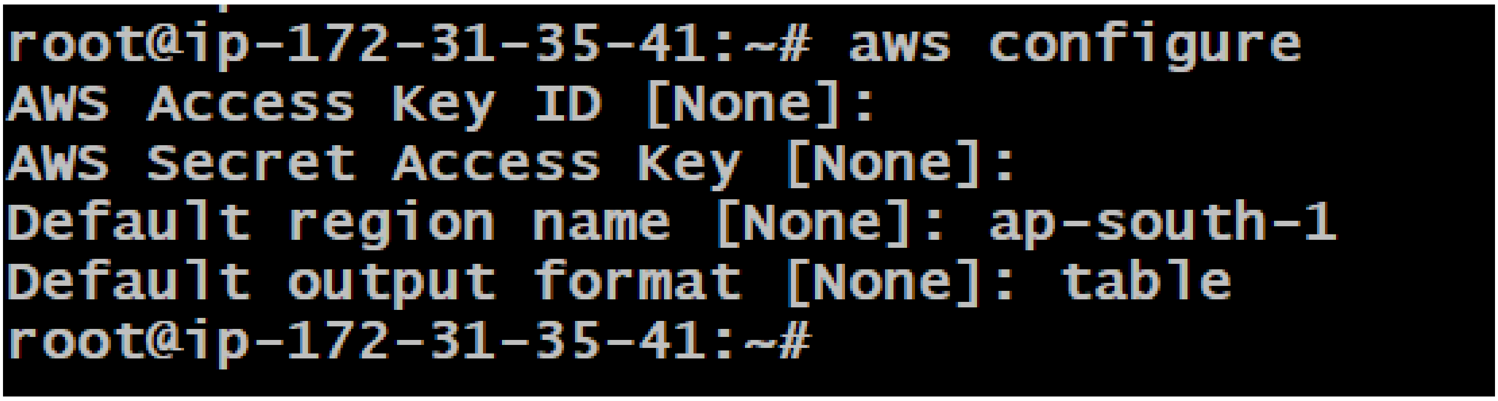
```
curl --silent --location "https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$(uname -s)_amd64.tar.gz" | tar xz -C /tmp

sudo mv /tmp/eksctl /usr/local/bin

eksctl version
```

STEP-3: CONFIGURE CREDS OF IAM USER

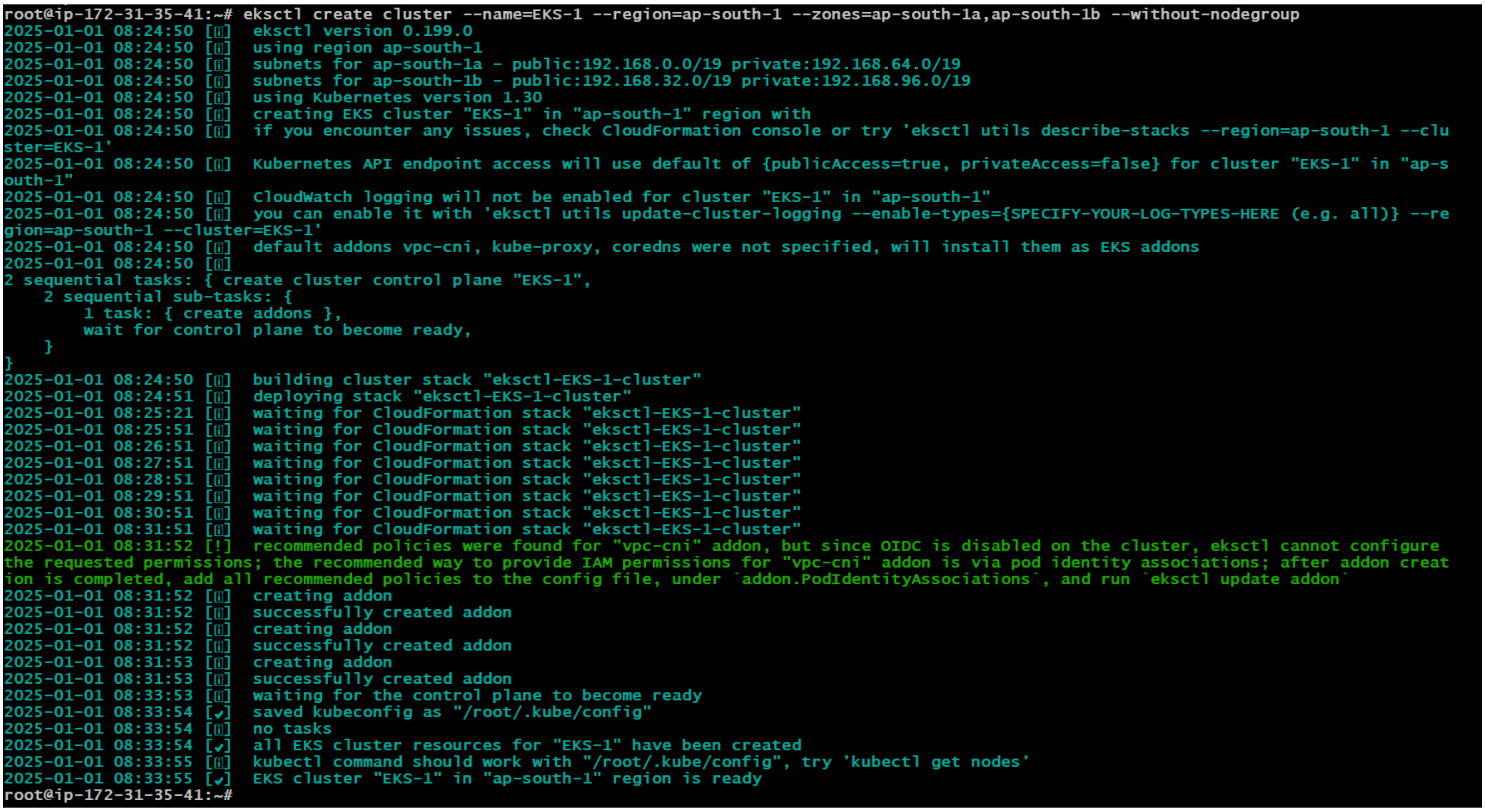
➔ aws configure



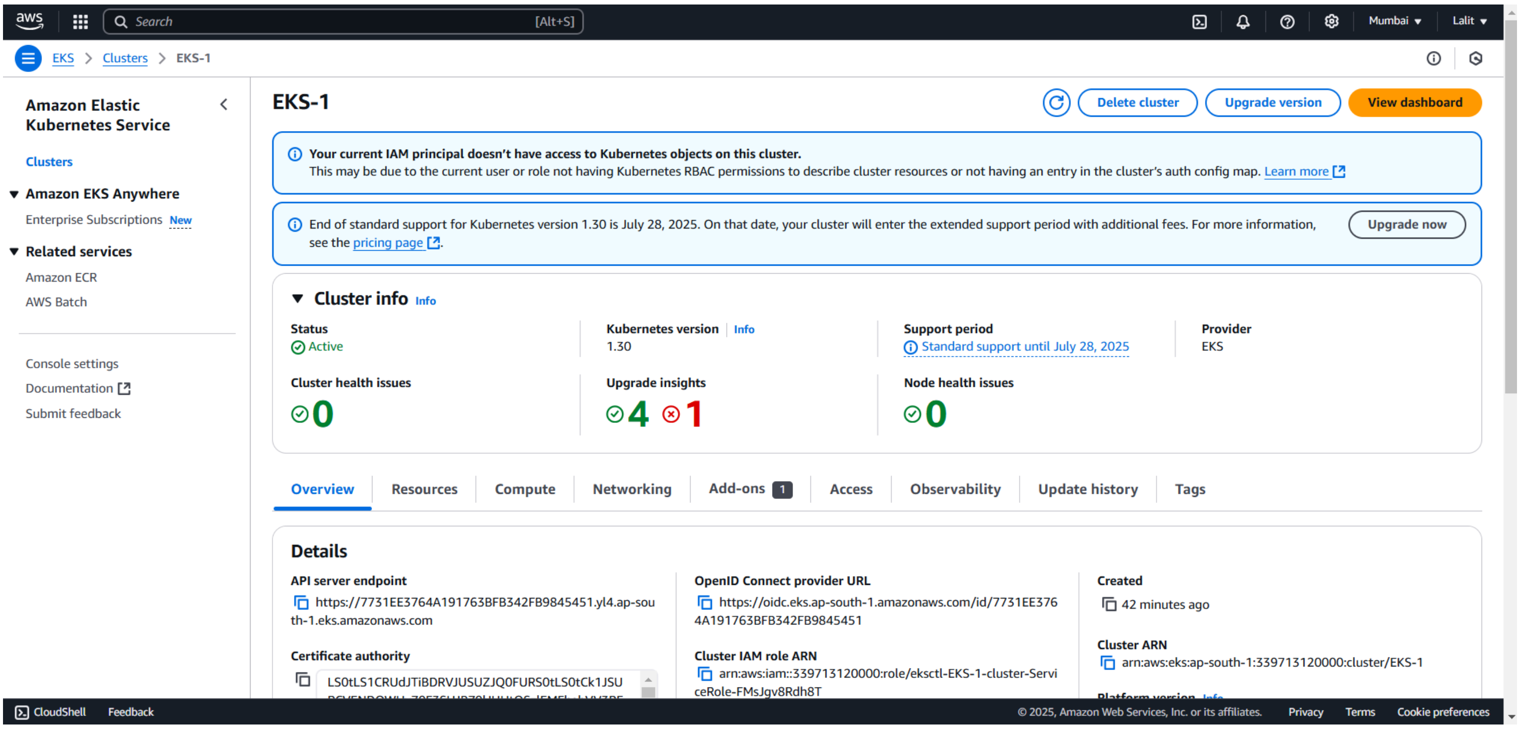
```
root@ip-172-31-35-41:~# aws configure
AWS Access Key ID [None]:
AWS Secret Access Key [None]:
Default region name [None]: ap-south-1
Default output format [None]: table
root@ip-172-31-35-41:~#
```

STEP-4: CREATE CLUSTER

- ➢ **Cluster Creation:**
- ➔ eksctl create cluster --name=EKS-1 --region=ap-south-1 --zones=ap-south-1a,ap-south-1b --without-nodegroup



```
root@ip-172-31-35-41:~# eksctl create cluster --name=EKS-1 --region=ap-south-1 --zones=ap-south-1a,ap-south-1b --without-nodegroup
2025-01-01 08:24:50 [ℹ]  eksctl version 0.199.0
2025-01-01 08:24:50 [ℹ]  using region ap-south-1
2025-01-01 08:24:50 [ℹ]  subnets for ap-south-1a - public:192.168.0.0/19 private:192.168.64.0/19
2025-01-01 08:24:50 [ℹ]  subnets for ap-south-1b - public:192.168.32.0/19 private:192.168.96.0/19
2025-01-01 08:24:50 [ℹ]  using Kubernetes version 1.30
2025-01-01 08:24:50 [ℹ]  creating EKS cluster "EKS-1" in "ap-south-1" region with
2025-01-01 08:24:50 [ℹ]  if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=ap-south-1 --clu
ster=EKS-1'
2025-01-01 08:24:50 [ℹ]  Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "EKS-1" in "ap-s
outh-1"
2025-01-01 08:24:50 [ℹ]  CloudWatch logging will not be enabled for cluster "EKS-1" in "ap-south-1"
2025-01-01 08:24:50 [ℹ]  you can enable it with 'eksctl utils update-cluster-logging --enable-types={SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)} --re
gion=ap-south-1 --cluster=EKS-1'
2025-01-01 08:24:50 [ℹ]  default addons vpc-cni, kube-proxy, coredns were not specified, will install them as EKS addons
2025-01-01 08:24:50 [ℹ]
2 sequential tasks: { create cluster control plane "EKS-1",
    2 sequential sub-tasks: {
        1 task: { create addons },
        wait for control plane to become ready,
    }
}
2025-01-01 08:24:50 [ℹ]  building cluster stack "eksctl-EKS-1-cluster"
2025-01-01 08:24:51 [ℹ]  deploying stack "eksctl-EKS-1-cluster"
2025-01-01 08:25:21 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:25:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:26:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:27:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:28:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:29:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:30:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:31:51 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-cluster"
2025-01-01 08:31:52 [!]  recommended policies were found for "vpc-cni" addon, but since OIDC is disabled on the cluster, eksctl cannot configure
the requested permissions; the recommended way to provide IAM permissions for "vpc-cni" addon is via pod identity associations; after addon creat
ion is completed, add all recommended policies to the config file, under `addon.PodIdentityAssociations`, and run `eksctl update addon`
2025-01-01 08:31:52 [ℹ]  creating addon
2025-01-01 08:31:52 [ℹ]  successfully created addon
2025-01-01 08:31:52 [ℹ]  creating addon
2025-01-01 08:31:52 [ℹ]  successfully created addon
2025-01-01 08:31:53 [ℹ]  creating addon
2025-01-01 08:31:53 [ℹ]  successfully created addon
2025-01-01 08:33:53 [ℹ]  waiting for the control plane to become ready
2025-01-01 08:33:54 [✔]  saved kubeconfig as "/root/.kube/config"
2025-01-01 08:33:54 [ℹ]  no tasks
2025-01-01 08:33:54 [✔]  all EKS cluster resources for "EKS-1" have been created
2025-01-01 08:33:55 [ℹ]  kubectl command should work with "/root/.kube/config", try 'kubectl get nodes'
2025-01-01 08:33:55 [✔]  EKS cluster "EKS-1" in "ap-south-1" region is ready
root@ip-172-31-35-41:~#
```



EKS-1

Your current IAM principal doesn't have access to Kubernetes objects on this cluster.
This may be due to the current user or role not having Kubernetes RBAC permissions to describe cluster resources or not having an entry in the cluster's auth config map. Learn more

End of standard support for Kubernetes version 1.30 is July 28, 2025. On that date, your cluster will enter the extended support period with additional fees. For more information, see the pricing page.

Cluster info Info

Status	Kubernetes version Info	Support period	Provider
✓ Active	1.30	Standard support until July 28, 2025	EKS

Cluster health issues	Upgrade insights	Node health issues
✓ 0	✓ 4 ⊗ 1	✓ 0

Details

API server endpoint
https://7731EE3764A191763BFB342FB9845451.yl4.ap-south-1.eks.amazonaws.com

Certificate authority
LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSU

OpenID Connect provider URL
https://oidc.eks.ap-south-1.amazonaws.com/id/7731EE3764A191763BFB342FB9845451

Cluster IAM role ARN
arn:aws:iam::339713120000:role/eksctl-EKS-1-cluster-ServiceRole-FMsJgv8Rdh8T

Created
42 minutes ago

Cluster ARN
arn:aws:eks:ap-south-1:339713120000:cluster/EKS-1

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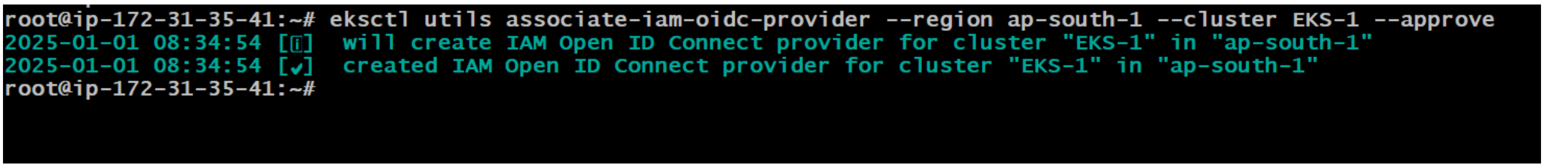
- **OIDC Provider:**

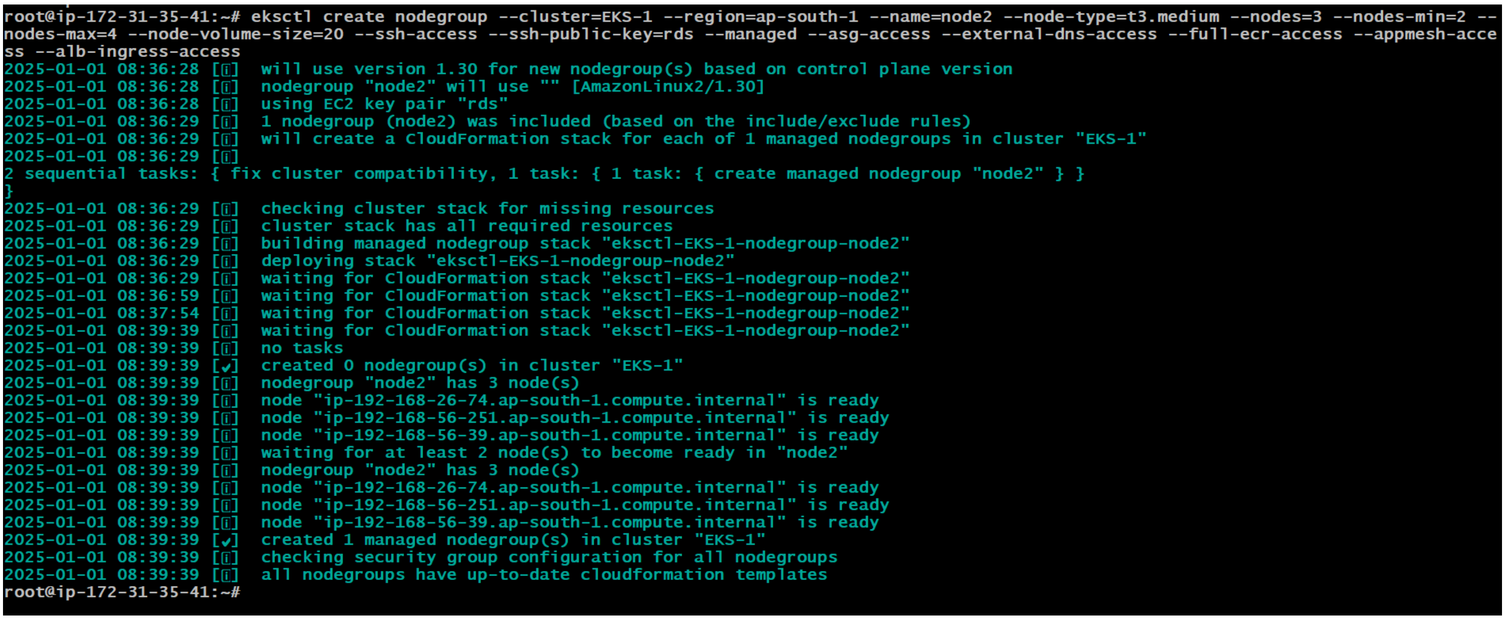
➔ eksctl utils associate-iam-oidc-provider --region ap-southeast-1 --cluster EKS-1 –approve



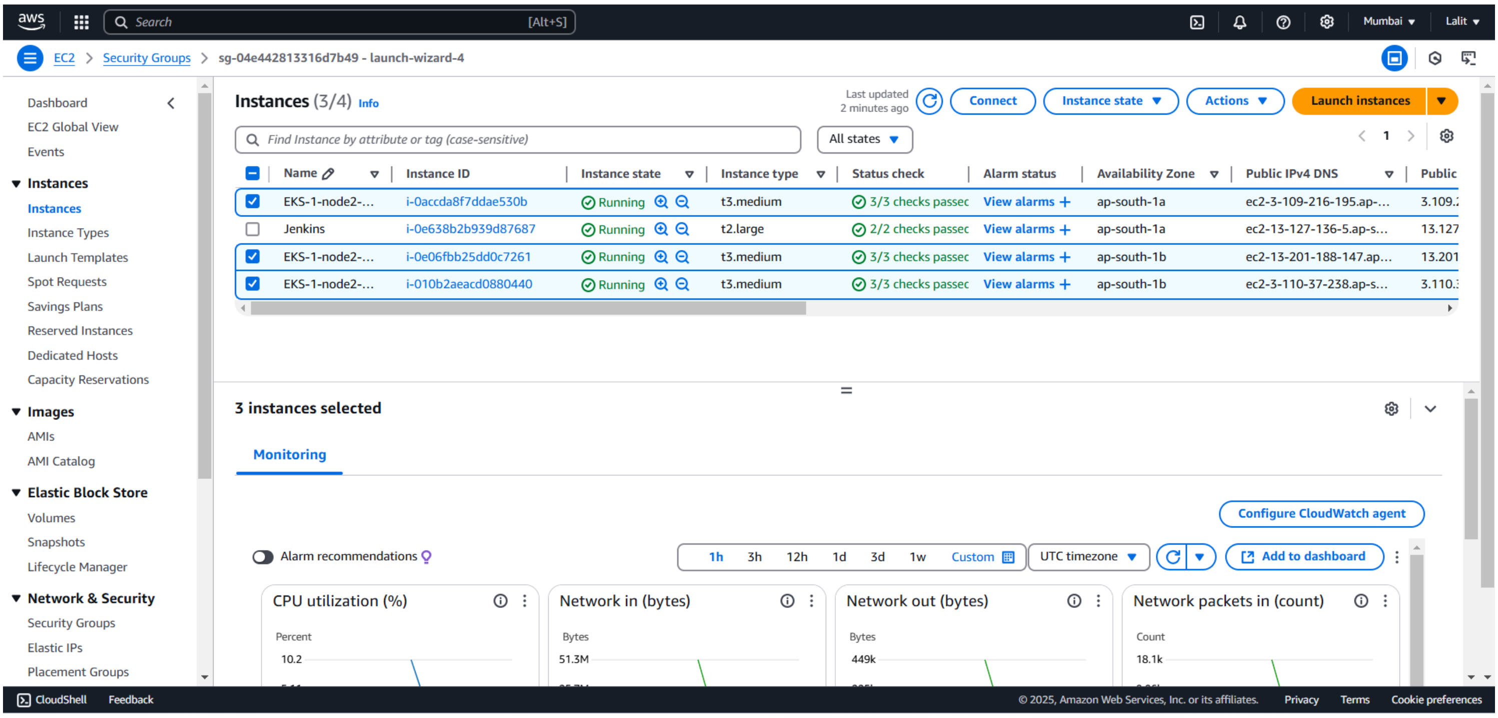
```
root@ip-172-31-35-41:~# eksctl utils associate-iam-oidc-provider --region ap-south-1 --cluster EKS-1 --approve
2025-01-01 08:34:54 [ℹ]  will create IAM Open ID Connect provider for cluster "EKS-1" in "ap-south-1"
2025-01-01 08:34:54 [✔]  created IAM Open ID Connect provider for cluster "EKS-1" in "ap-south-1"
root@ip-172-31-35-41:~#
```

- **Node Group Creation:**

➔ eksctl create nodegroup --cluster=EKS-1 --region=ap-southeast-1 --name=node2 --node-type=t3.medium --nodes=3 --nodes-min=2 --nodes-max=4 --node-volume-size=20 --ssh-access --ssh-public-key=DevOps --managed --asg-access --external-dns-access --full-ecr-access --appmesh-access --alb-ingress-access



```
root@ip-172-31-35-41:~# eksctl create nodegroup --cluster=EKS-1 --region=ap-south-1 --name=node2 --node-type=t3.medium --nodes=3 --nodes-min=2 --
nodes-max=4 --node-volume-size=20 --ssh-access --ssh-public-key=rds --managed --asg-access --external-dns-access --full-ecr-access --appmesh-acce
ss --alb-ingress-access
2025-01-01 08:36:28 [ℹ]  will use version 1.30 for new nodegroup(s) based on control plane version
2025-01-01 08:36:28 [ℹ]  nodegroup "node2" will use "" [AmazonLinux2/1.30]
2025-01-01 08:36:28 [ℹ]  using EC2 key pair "rds"
2025-01-01 08:36:29 [ℹ]  1 nodegroup (node2) was included (based on the include/exclude rules)
2025-01-01 08:36:29 [ℹ]  will create a CloudFormation stack for each of 1 managed nodegroups in cluster "EKS-1"
2025-01-01 08:36:29 [ℹ]
2 sequential tasks: { fix cluster compatibility, 1 task: { 1 task: { create managed nodegroup "node2" } }
}
2025-01-01 08:36:29 [ℹ]  checking cluster stack for missing resources
2025-01-01 08:36:29 [ℹ]  cluster stack has all required resources
2025-01-01 08:36:29 [ℹ]  building managed nodegroup stack "eksctl-EKS-1-nodegroup-node2"
2025-01-01 08:36:29 [ℹ]  deploying stack "eksctl-EKS-1-nodegroup-node2"
2025-01-01 08:36:29 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-nodegroup-node2"
2025-01-01 08:36:59 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-nodegroup-node2"
2025-01-01 08:37:54 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-nodegroup-node2"
2025-01-01 08:39:39 [ℹ]  waiting for CloudFormation stack "eksctl-EKS-1-nodegroup-node2"
2025-01-01 08:39:39 [ℹ]  no tasks
2025-01-01 08:39:39 [✔]  created 0 nodegroup(s) in cluster "EKS-1"
2025-01-01 08:39:39 [ℹ]  nodegroup "node2" has 3 node(s)
2025-01-01 08:39:39 [ℹ]  node "ip-192-168-26-74.ap-south-1.compute.internal" is ready
2025-01-01 08:39:39 [ℹ]  node "ip-192-168-56-251.ap-south-1.compute.internal" is ready
2025-01-01 08:39:39 [ℹ]  node "ip-192-168-56-39.ap-south-1.compute.internal" is ready
2025-01-01 08:39:39 [ℹ]  waiting for at least 2 node(s) to become ready in "node2"
2025-01-01 08:39:39 [ℹ]  nodegroup "node2" has 3 node(s)
2025-01-01 08:39:39 [ℹ]  node "ip-192-168-26-74.ap-south-1.compute.internal" is ready
2025-01-01 08:39:39 [ℹ]  node "ip-192-168-56-251.ap-south-1.compute.internal" is ready
2025-01-01 08:39:39 [ℹ]  node "ip-192-168-56-39.ap-south-1.compute.internal" is ready
2025-01-01 08:39:39 [✔]  created 1 managed nodegroup(s) in cluster "EKS-1"
2025-01-01 08:39:39 [ℹ]  checking security group configuration for all nodegroups
2025-01-01 08:39:39 [ℹ]  all nodegroups have up-to-date cloudformation templates
root@ip-172-31-35-41:~#
```



Instances (3/4) Info

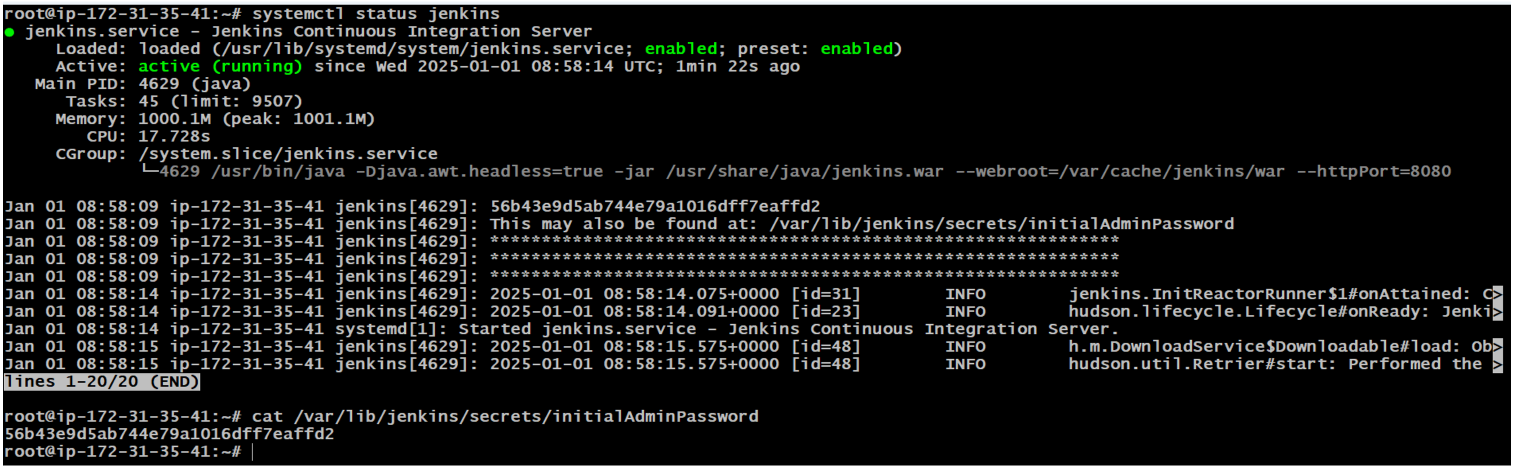
☐	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public
☑	EKS-1-node2-...	i-0accda8f7ddae530b	Running	t3.medium	3/3 checks passec	View alarms +	ap-south-1a	ec2-3-109-216-195.ap-...	3.109.
☐	Jenkins	i-0e638b2b939d87687	Running	t2.large	2/2 checks passec	View alarms +	ap-south-1a	ec2-13-127-136-5.ap-s...	13.127
☑	EKS-1-node2-...	i-0e06fbb25dd0c7261	Running	t3.medium	3/3 checks passec	View alarms +	ap-south-1b	ec2-13-201-188-147.ap...	13.201
☑	EKS-1-node2-...	i-010b2aeacd0880440	Running	t3.medium	3/3 checks passec	View alarms +	ap-south-1b	ec2-3-110-37-238.ap-s...	3.110.

3 instances selected

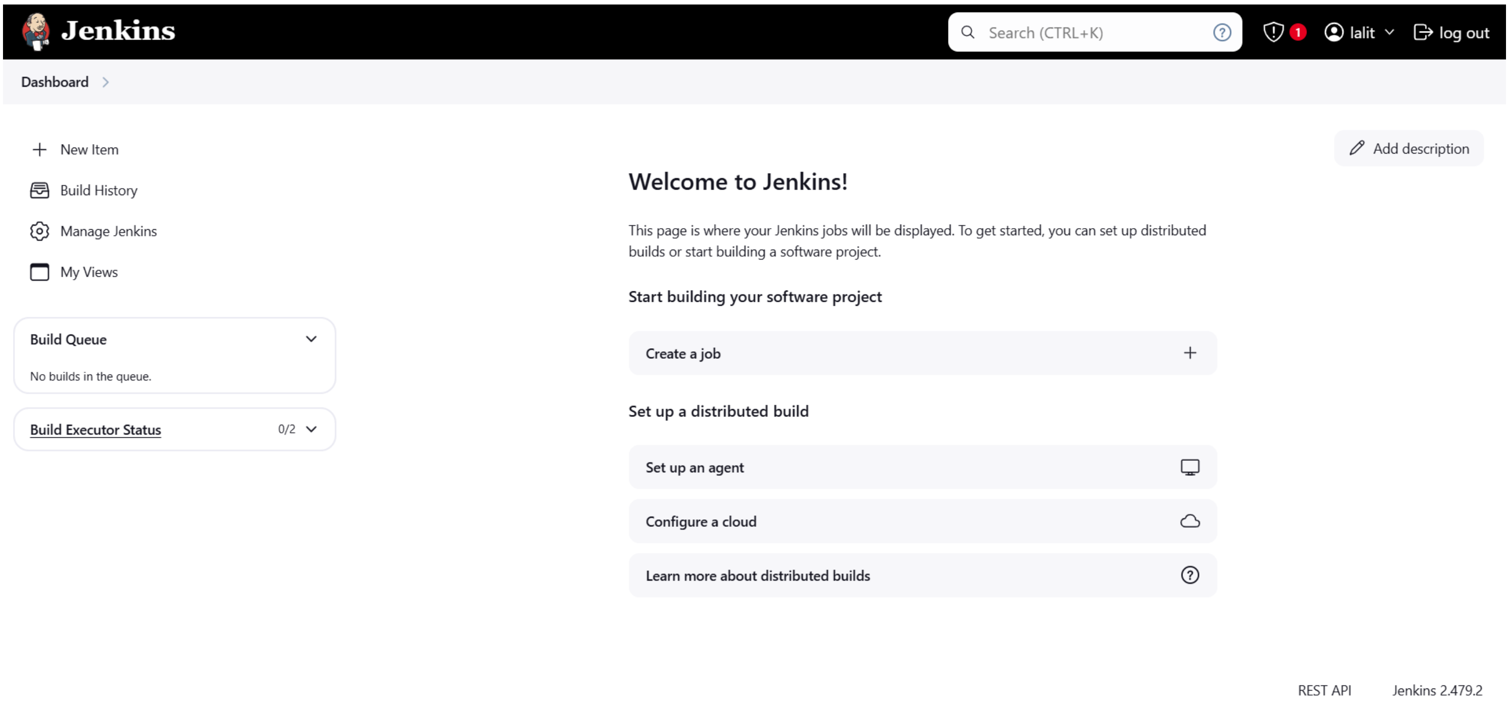
STELP-5: INSTALL JENKINS & DOCKER

- **Jenkins:**

➔ sudo apt install openjdk-17-jre-headless -y
sudo wget -O /usr/share/keyrings/jenkins-keyring.asc
https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]
https://pkg.jenkins.io/debian-stable binary/" | sudo tee
/etc/apt/sources.list.d/jenkins.list > /dev/null
sudo apt-get update
sudo apt-get install jenkins -y



```
root@ip-172-31-35-41:~# systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
     Loaded: loaded (/usr/lib/systemd/system/jenkins.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-01-01 08:58:14 UTC; 1min 22s ago
   Main PID: 4629 (java)
      Tasks: 45 (limit: 9507)
     Memory: 1000.1M (peak: 1001.1M)
        CPU: 17.728s
     CGroup: /system.slice/jenkins.service
             └─4629 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Jan 01 08:58:09 ip-172-31-35-41 jenkins[4629]: 56b43e9d5ab744e79a1016dff7eaffd2
Jan 01 08:58:09 ip-172-31-35-41 jenkins[4629]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Jan 01 08:58:09 ip-172-31-35-41 jenkins[4629]: *************************************************************
Jan 01 08:58:09 ip-172-31-35-41 jenkins[4629]: *************************************************************
Jan 01 08:58:09 ip-172-31-35-41 jenkins[4629]: *************************************************************
Jan 01 08:58:14 ip-172-31-35-41 jenkins[4629]: 2025-01-01 08:58:14.075+0000 [id=31]        INFO        jenkins.InitReactorRunner$1#onAttained: C>
Jan 01 08:58:14 ip-172-31-35-41 jenkins[4629]: 2025-01-01 08:58:14.091+0000 [id=23]        INFO        hudson.lifecycle.Lifecycle#onReady: Jenki>
Jan 01 08:58:14 ip-172-31-35-41 systemd[1]: Started jenkins.service - Jenkins Continuous Integration Server.
Jan 01 08:58:15 ip-172-31-35-41 jenkins[4629]: 2025-01-01 08:58:15.575+0000 [id=48]        INFO        h.m.DownloadService$Downloadable#load: Ob>
Jan 01 08:58:15 ip-172-31-35-41 jenkins[4629]: 2025-01-01 08:58:15.575+0000 [id=48]        INFO        hudson.util.Retrier#start: Performed the >
lines 1-20/20 (END)

root@ip-172-31-35-41:~# cat /var/lib/jenkins/secrets/initialAdminPassword
56b43e9d5ab744e79a1016dff7eaffd2
root@ip-172-31-35-41:~# |
```



No builds in the queue.

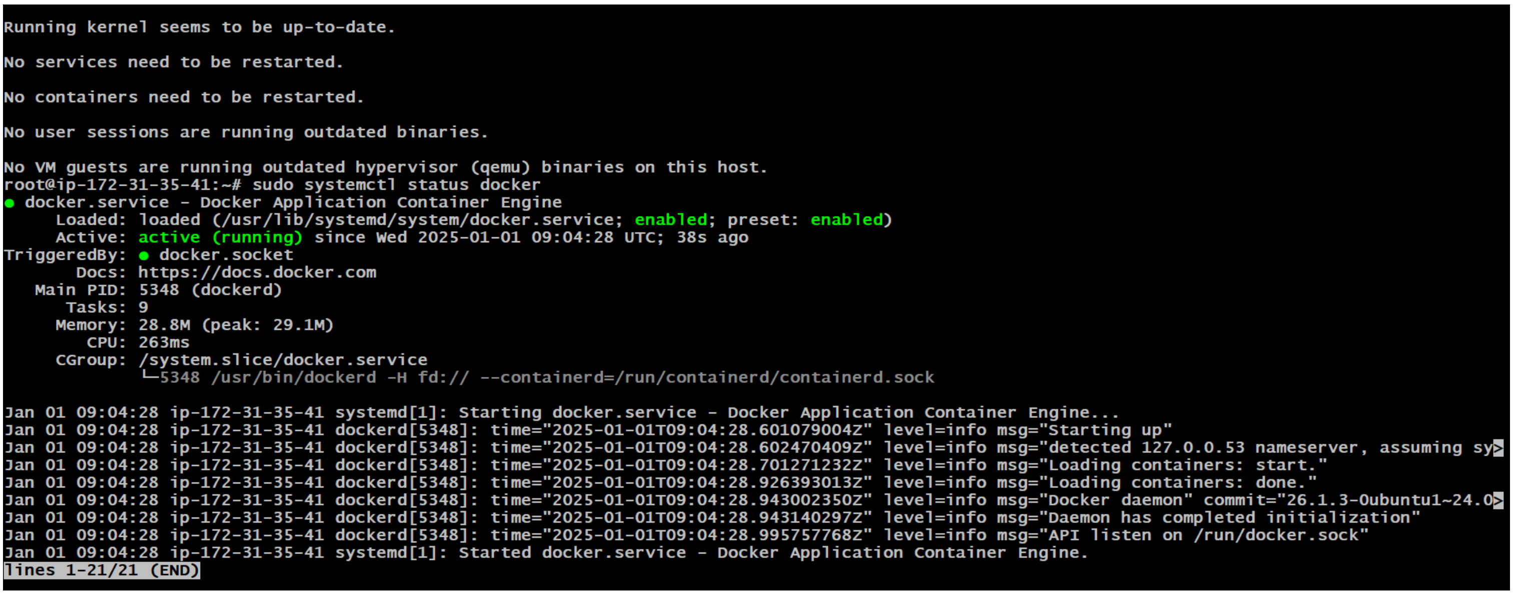
Welcome to Jenkins!

This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.

Start building your software project

Set up a distributed build

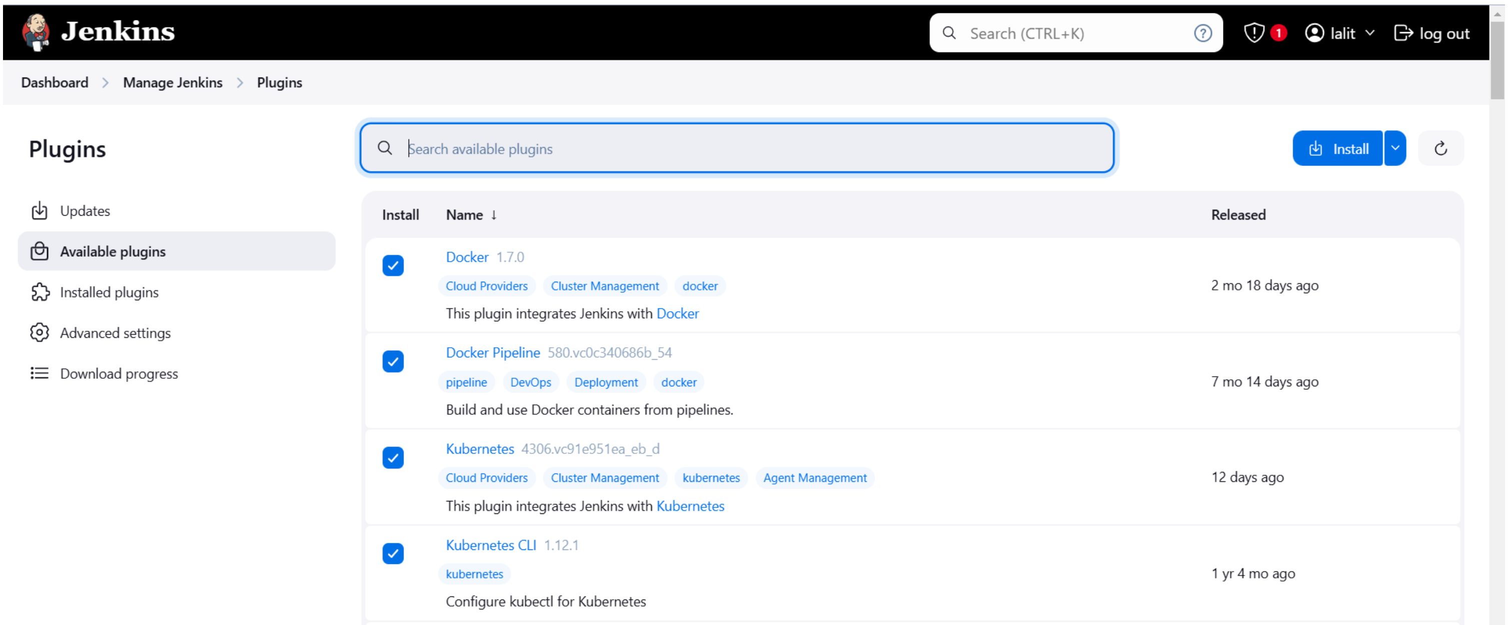
- ➢ **Docker:**
- ➔ sudo apt install docker.io -y
- ➔ sudo chmod 777 /var/run/docker.sock



```
Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-35-41:~# sudo systemctl status docker
● docker.service - Docker Application Container Engine
     Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-01-01 09:04:28 UTC; 38s ago
TriggeredBy: ● docker.socket
       Docs: https://docs.docker.com
   Main PID: 5348 (dockerd)
      Tasks: 9
     Memory: 28.8M (peak: 29.1M)
        CPU: 263ms
     CGroup: /system.slice/docker.service
             └─5348 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock

Jan 01 09:04:28 ip-172-31-35-41 systemd[1]: Starting docker.service - Docker Application Container Engine...
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.601079004Z" level=info msg="Starting up"
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.602470409Z" level=info msg="detected 127.0.0.53 nameserver, assuming sy>
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.701271232Z" level=info msg="Loading containers: start."
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.926393013Z" level=info msg="Loading containers: done."
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.943002350Z" level=info msg="Docker daemon" commit="26.1.3-0ubuntu1~24.0>
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.943140297Z" level=info msg="Daemon has completed initialization"
Jan 01 09:04:28 ip-172-31-35-41 dockerd[5348]: time="2025-01-01T09:04:28.995757768Z" level=info msg="API listen on /run/docker.sock"
Jan 01 09:04:28 ip-172-31-35-41 systemd[1]: Started docker.service - Docker Application Container Engine.
lines 1-21/21 (END)
```

STEP-6: DOWNLOAD PLUGINS

- ➢ **Required Plugins:**
- ➔ Docker
- ➔ Docker Pipeline
- ➔ Kubernetes
- ➔ Kubernetes CLI

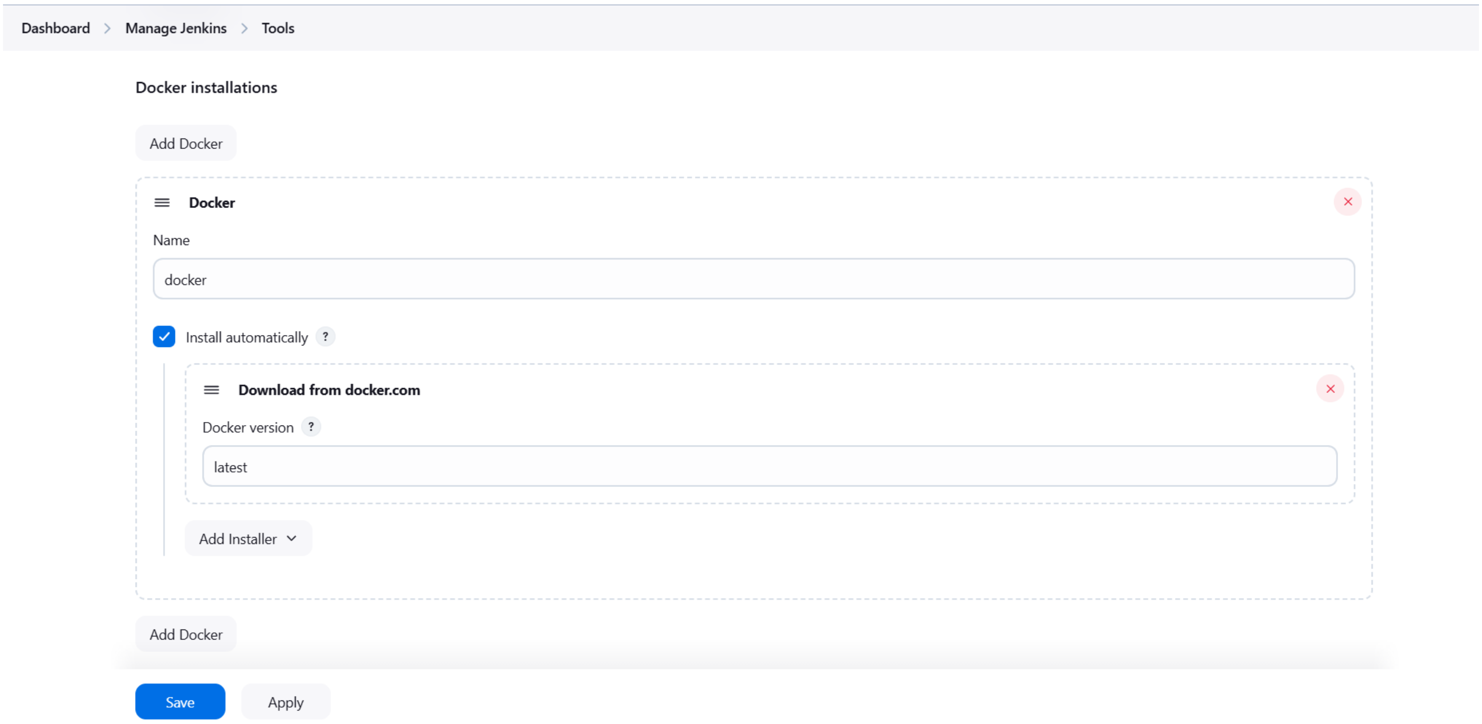


Install	Name ↓	Released
☑	Docker 1.7.0 Cloud Providers · Cluster Management · docker This plugin integrates Jenkins with Docker	2 mo 18 days ago
☑	Docker Pipeline 580.vc0c340686b_54 pipeline · DevOps · Deployment · docker Build and use Docker containers from pipelines.	7 mo 14 days ago
☑	Kubernetes 4306.vc91e951ea_eb_d Cloud Providers · Cluster Management · kubernetes · Agent Management This plugin integrates Jenkins with Kubernetes	12 days ago
☑	Kubernetes CLI 1.12.1 kubernetes Configure kubectl for Kubernetes	1 yr 4 mo ago

Configure Jenkins for Docker:

- **In Jenkins Dashboard:**

➔ Manage Jenkins → Tools → Docker installations → Name: docker → Install automatically → Docker version: latest.



Dashboard > Manage Jenkins > Tools

Docker installations

Docker

Name: docker

☑ Install automatically

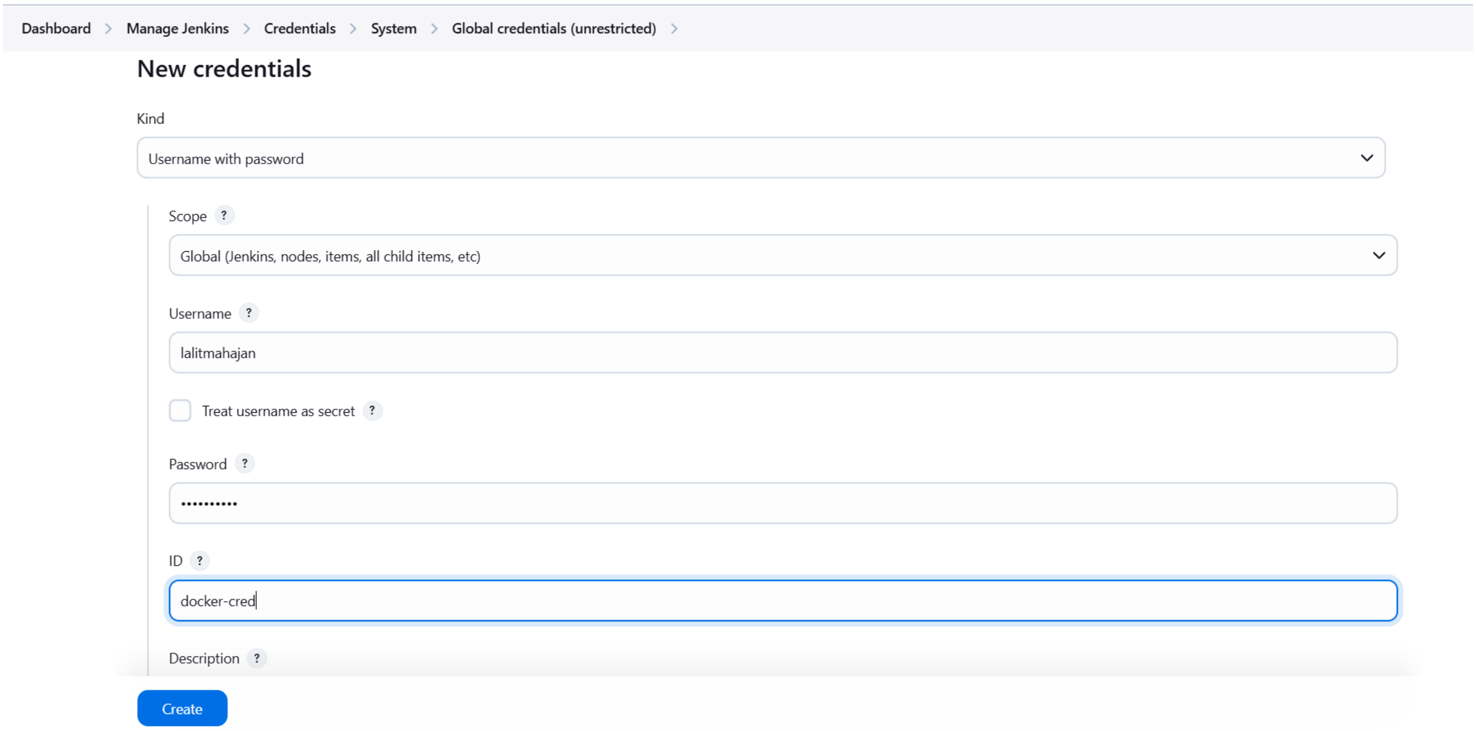
Download from docker.com

Docker version: latest

STEP-7: ADD CREDS FOR DOCKER & GITHUB

Add DockerHub Credentials:

- Dashboard → Manage Jenkins → Credentials → System → Global credentials (unrestricted).
- Add: Username: lalitmahajan, Password: [Docker password], ID: docker.



Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >

New credentials

Kind: Username with password

Scope: Global (Jenkins, nodes, items, all child items, etc)

Username: lalitmahajan

□ Treat username as secret

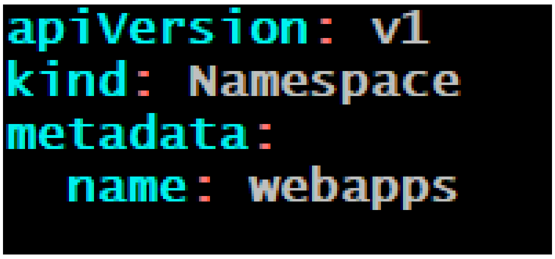
Password: ••••••••••

ID: docker-cred

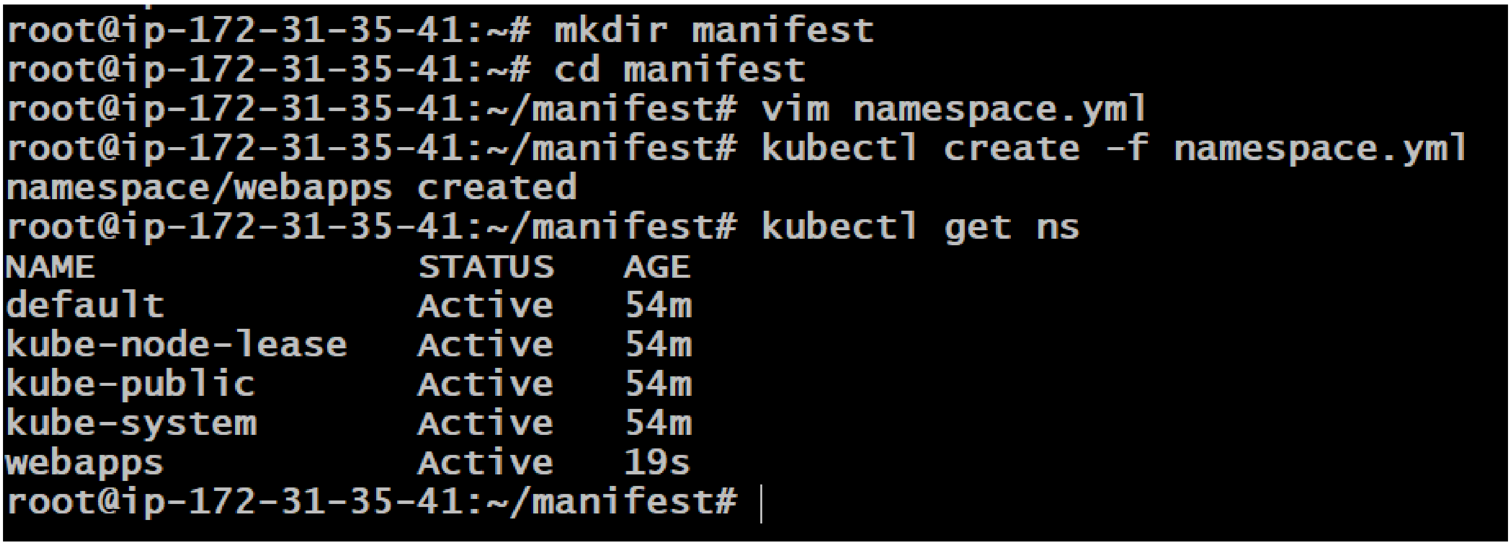
Description

STEP-8: CREATE SERVICE ACCOUNT, ROLE, ROLE BIND FOR webapps Namespace

➔ NameSpace

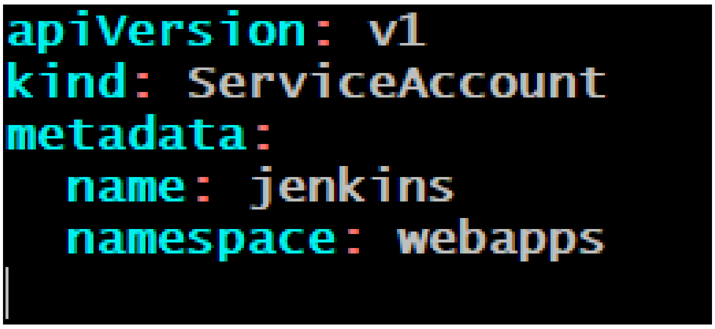


```
apiVersion: v1
kind: Namespace
metadata:
  name: webapps
```

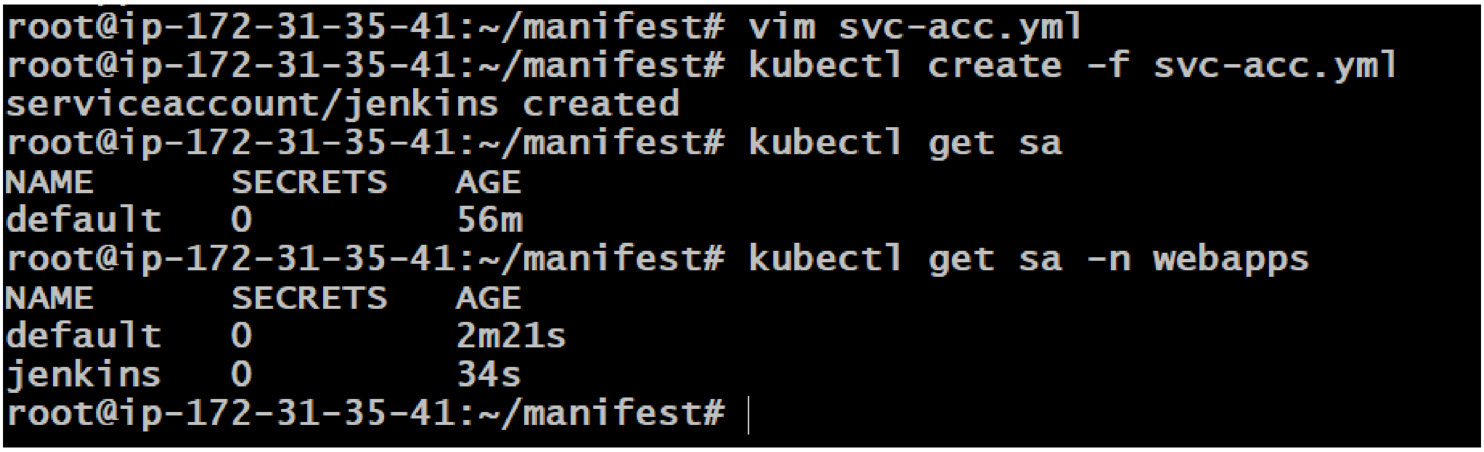


```
root@ip-172-31-35-41:~# mkdir manifest
root@ip-172-31-35-41:~# cd manifest
root@ip-172-31-35-41:~/manifest# vim namespace.yml
root@ip-172-31-35-41:~/manifest# kubectl create -f namespace.yml
namespace/webapps created
root@ip-172-31-35-41:~/manifest# kubectl get ns
NAME              STATUS   AGE
default           Active   54m
kube-node-lease   Active   54m
kube-public       Active   54m
kube-system       Active   54m
webapps           Active   19s
root@ip-172-31-35-41:~/manifest#
```

➔ Service Account

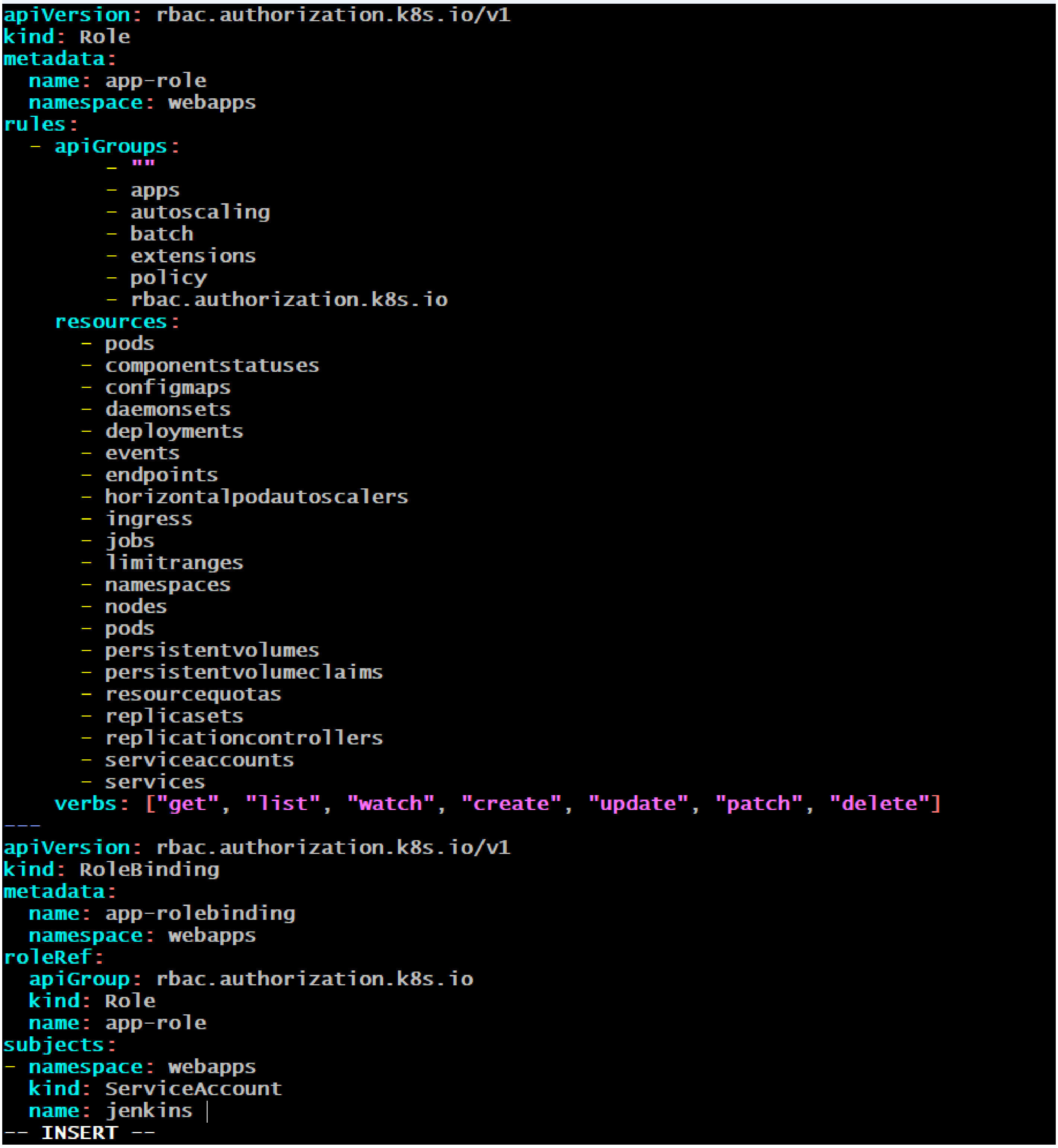


```
apiVersion: v1
kind: ServiceAccount
metadata:
  name: jenkins
  namespace: webapps
```

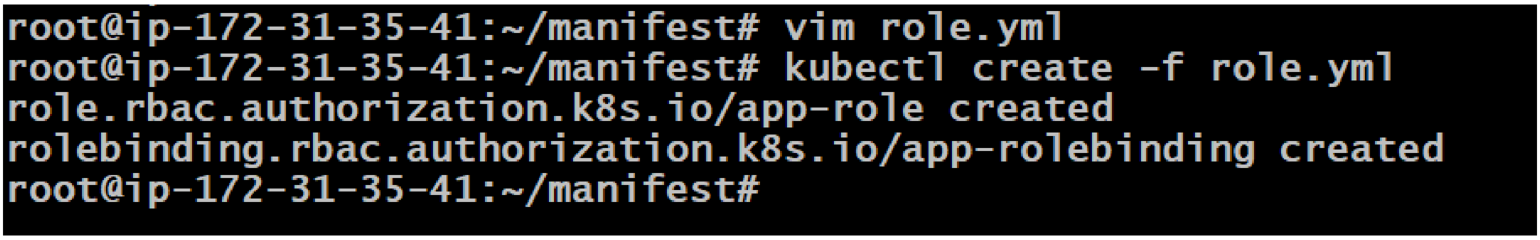


```
root@ip-172-31-35-41:~/manifest# vim svc-acc.yml
root@ip-172-31-35-41:~/manifest# kubectl create -f svc-acc.yml
serviceaccount/jenkins created
root@ip-172-31-35-41:~/manifest# kubectl get sa
NAME      SECRETS   AGE
default   0         56m
root@ip-172-31-35-41:~/manifest# kubectl get sa -n webapps
NAME      SECRETS   AGE
default   0         2m21s
jenkins   0         34s
root@ip-172-31-35-41:~/manifest#
```

➔ Role

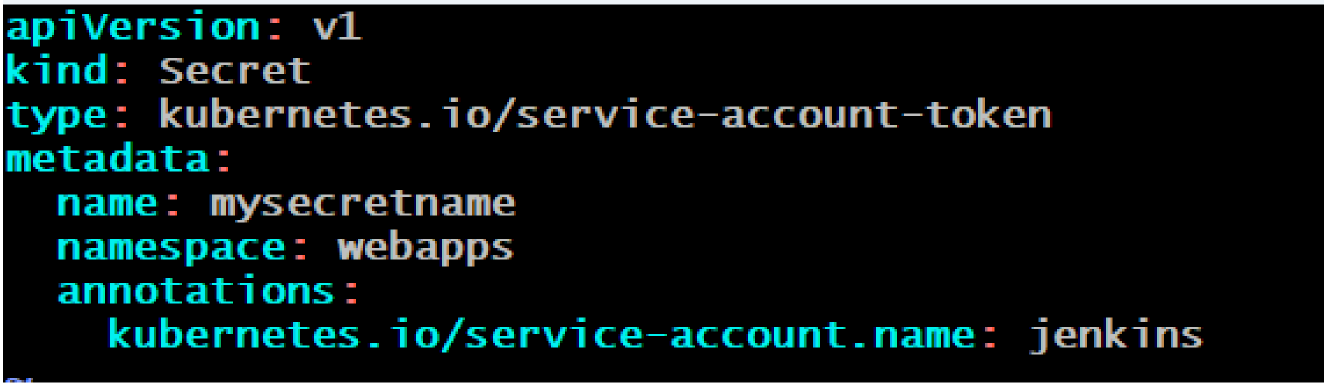


```
apiVersion: rbac.authorization.k8s.io/v1
kind: Role
metadata:
  name: app-role
  namespace: webapps
rules:
  - apiGroups:
        - ""
        - apps
        - autoscaling
        - batch
        - extensions
        - policy
        - rbac.authorization.k8s.io
    resources:
      - pods
      - componentstatuses
      - configmaps
      - daemonsets
      - deployments
      - events
      - endpoints
      - horizontalpodautoscalers
      - ingress
      - jobs
      - limitranges
      - namespaces
      - nodes
      - pods
      - persistentvolumes
      - persistentvolumeclaims
      - resourcequotas
      - replicasets
      - replicationcontrollers
      - serviceaccounts
      - services
    verbs: ["get", "list", "watch", "create", "update", "patch", "delete"]
---
apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
metadata:
  name: app-rolebinding
  namespace: webapps
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: Role
  name: app-role
subjects:
- namespace: webapps
  kind: ServiceAccount
  name: jenkins
-- INSERT --
```

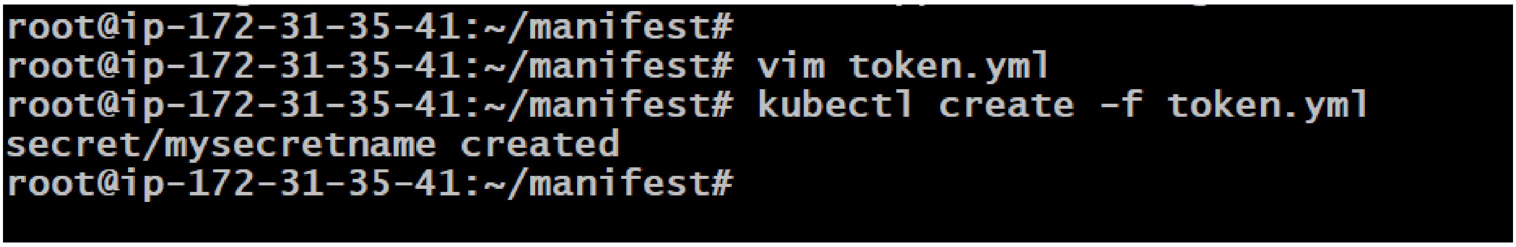


```
root@ip-172-31-35-41:~/manifest# vim role.yml
root@ip-172-31-35-41:~/manifest# kubectl create -f role.yml
role.rbac.authorization.k8s.io/app-role created
rolebinding.rbac.authorization.k8s.io/app-rolebinding created
root@ip-172-31-35-41:~/manifest#
```

➔ **Token**



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

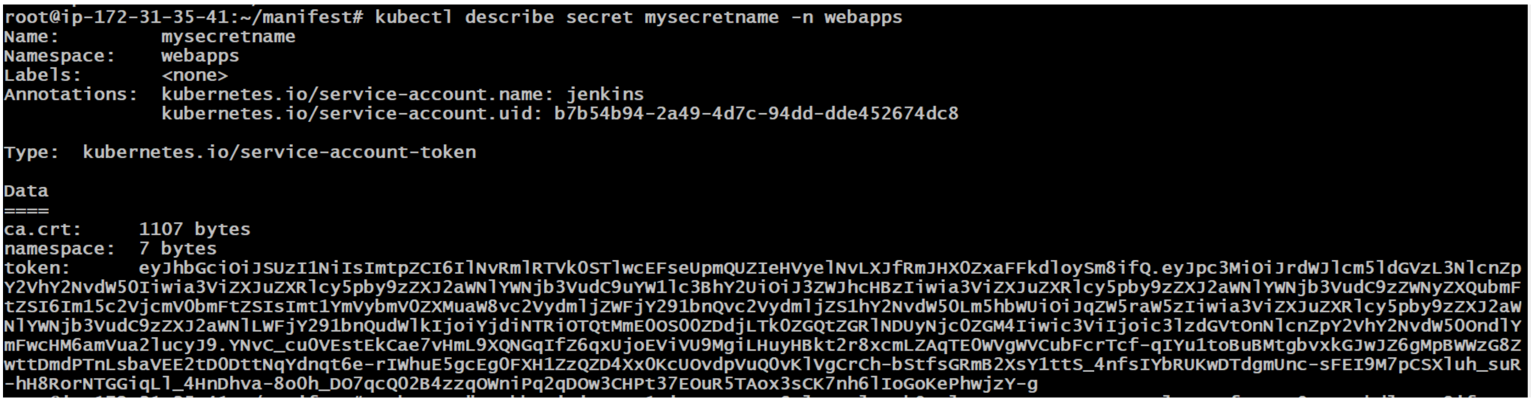


```
root@ip-172-31-35-41:~/manifest#
root@ip-172-31-35-41:~/manifest# vim token.yml
root@ip-172-31-35-41:~/manifest# kubectl create -f token.yml
secret/mysecretname created
root@ip-172-31-35-41:~/manifest#
```

Get Token:

- **Command:**

  ➔ kubectl describe secret mysecretname -n webapps

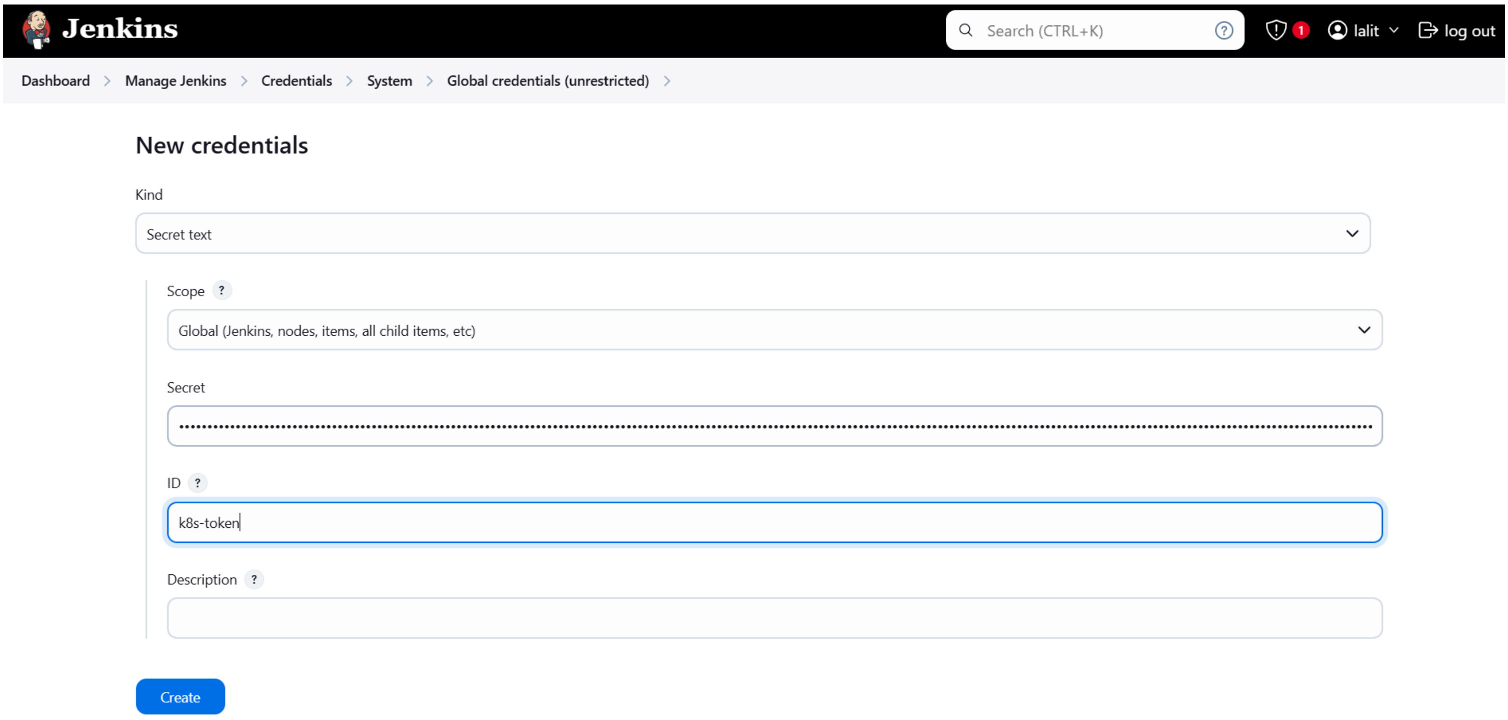


```
root@ip-172-31-35-41:~/manifest# kubectl describe secret mysecretname -n webapps
Name:         mysecretname
Namespace:    webapps
Labels:       <none>
Annotations:  kubernetes.io/service-account.name: jenkins
              kubernetes.io/service-account.uid: b7b54b94-2a49-4d7c-94dd-dde452674dc8

Type:  kubernetes.io/service-account-token

Data
====
ca.crt:     1107 bytes
namespace:  7 bytes
token:      eyJhbGciOiJSUzI1NiIsImtpZCI6IlNvRmlRTVk0STlwcEFseUpmQUZIeHVyelNvLXJfRmJHX0ZxaFFkdloySm8ifQ.eyJpc3MiOiJrdWJlcm5ldGVzL3NlcnZp
Y2VhY2NvdW50Iiwia3ViZXJuZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9uYW1lc3BhY2UiOiJ3ZWJhcHBzIiwia3ViZXJuZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9zZWNyZXQubmF
tZSI6Im15c2VjcmV0bmFtZSIsImt1YmVybmV0ZXMuaW8vc2VydmljZWFjY291bnQvc2VydmljZS1hY2NvdW50Lm5hbWUiOiJqZW5raW5zIiwia3ViZXJuZXRlcy5pby9zZXJ2aW
NlYWNjb3VudC9zZXJ2aWNlLWFjY291bnQudWlkIjoiYjdiNTRiOTQtMmE0OS00ZDdjLTk0ZGQtZGRlNDUyNjc0ZGM4Iiwic3ViIjoic3lzdGVtOnNlcnZpY2VhY2NvdW50OndlY
mFwcHM6amVua2lucyJ9.YNvC_cu0VEstEkCae7vHmL9XQNGqIfZ6qxUjoEViVU9MgiLHuyHBkt2r8xcmLZAqTE0WVgWVCubFcrTcf-qIYu1toBuBMtgbvxkGJwJZ6gMpBWWzG8Z
wttDmdPTnLsbaVEE2tD0DttNqYdnqt6e-rIWhuE5gcEg0FXH1ZzQZD4Xx0KcUOvdpVuQ0vKlVgCrCh-bStfsGRmB2XsY1ttS_4nfsIYbRUKwDTdgmUnc-sFEI9M7pCSXluh_suR
-hH8RorNTGGiqLl_4HnDhva-8o0h_DO7qcQ02B4zzqOWniPq2qDOw3CHPt37EOuR5TAox3sCK7nh6lIoGoKePhwjzY-g
```

STEP-9: ADD TOKEN TO CREDS

Add Token:

- Dashboard → Manage Jenkins → Credentials → System → Global credentials (unrestricted).
- Add: Secret: [Generated token], ID: k8s-token.



Jenkins

Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >

New credentials

Kind: Secret text

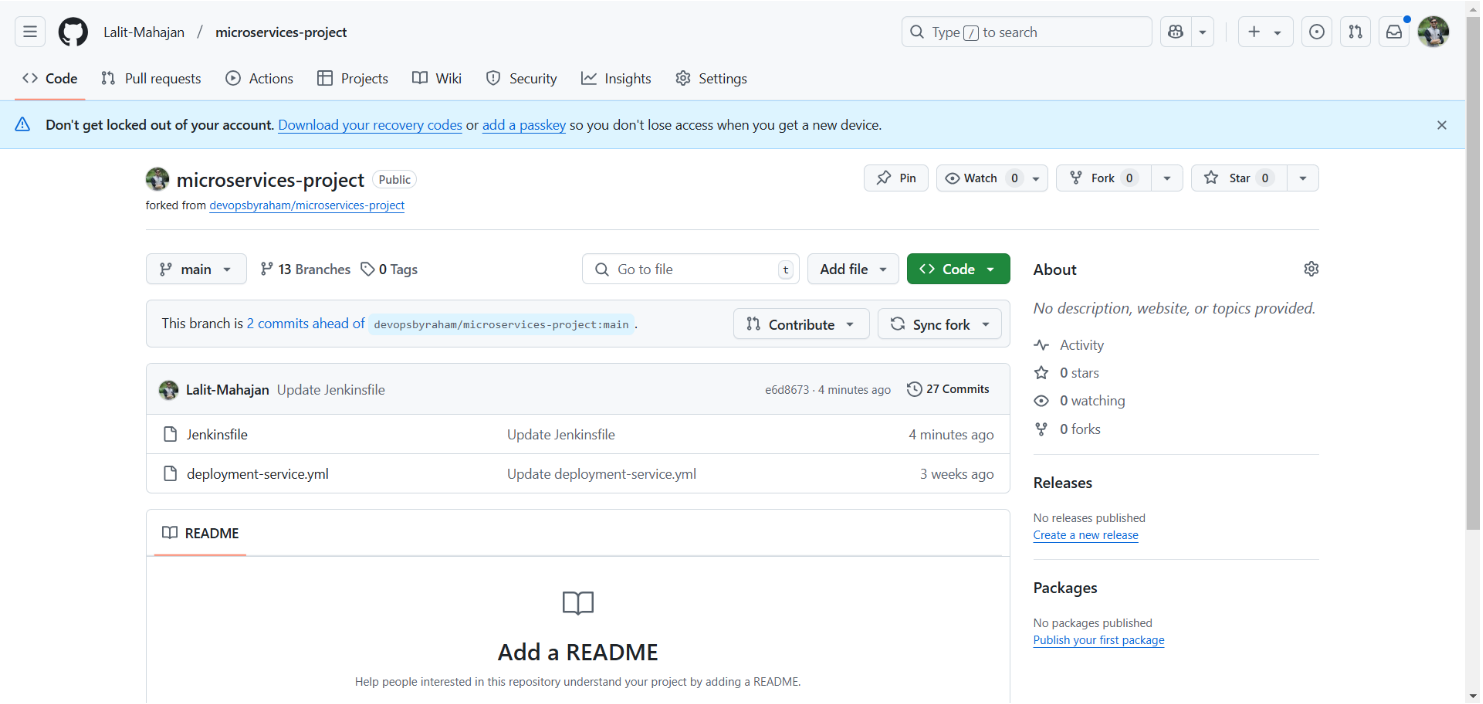
Scope: Global (Jenkins, nodes, items, all child items, etc)

Secret: ••

ID: k8s-token

Description:

STEP-10: CHANGE THE DOCKERHUB ID IN ALL SERVICES AND TOKEN & END POINT IN MAIN BRANCH



Lalit-Mahajan / microservices-project

Don't get locked out of your account. Download your recovery codes or add a passkey so you don't lose access when you get a new device.

microservices-project Public

forked from devopsbyraham/microservices-project

This branch is 2 commits ahead of devopsbyraham/microservices-project:main .

Lalit-Mahajan Update Jenkinsfile e6d8673 · 4 minutes ago 27 Commits

Jenkinsfile	Update Jenkinsfile	4 minutes ago
deployment-service.yml	Update deployment-service.yml	3 weeks ago

About

No description, website, or topics provided.

Activity
0 stars
0 watching
0 forks

Releases

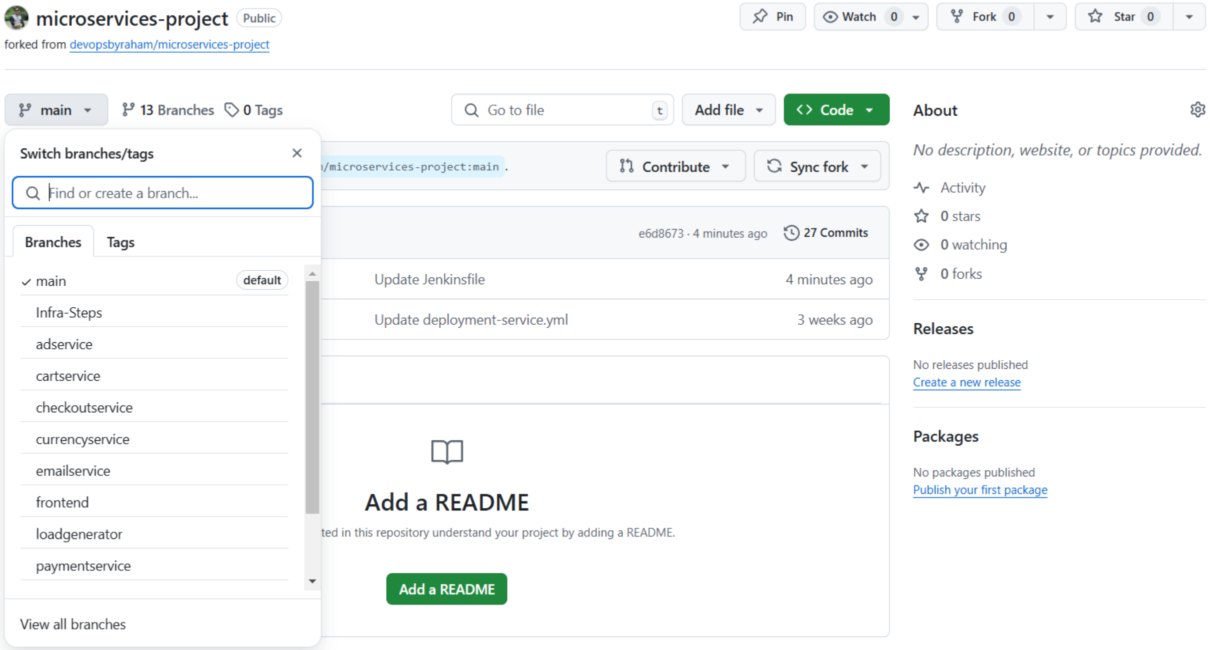
No releases published
Create a new release

Packages

No packages published
Publish your first package

Add a README

Help people interested in this repository understand your project by adding a README.


microservices-project Public

forked from devopsbyraham/microservices-project

Switch branches/tags

Find or create a branch...

Branches | Tags

- ✓ main default
- Infra-Steps
- adservice
- cartservice
- checkoutservice
- currencyservice
- emailservice
- frontend
- loadgenerator
- paymentservice

View all branches

/microservices-project:main .

e6d8673 · 4 minutes ago 27 Commits

Update Jenkinsfile	4 minutes ago
Update deployment-service.yml	3 weeks ago

Add a README

ted in this repository understand your project by adding a README.

About

No description, website, or topics provided.

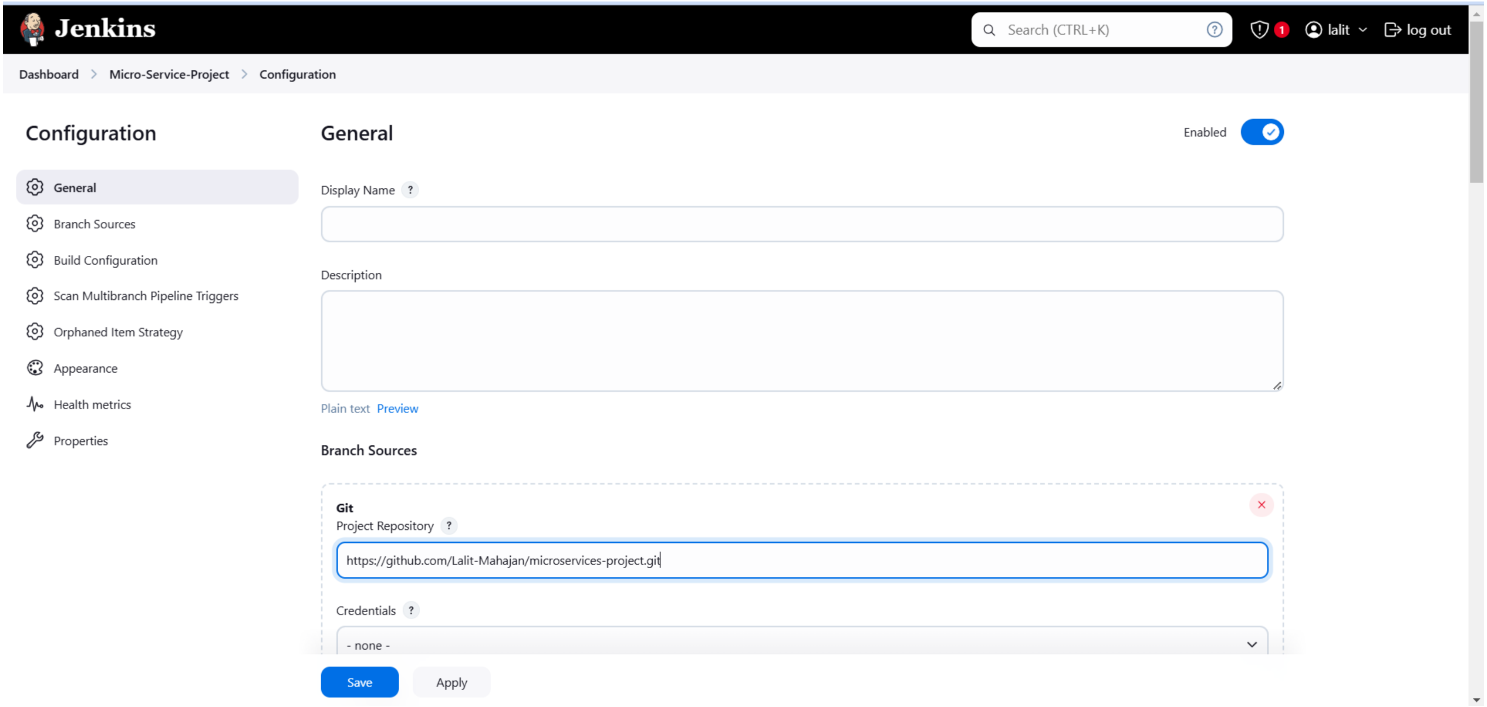
- Activity
- 0 stars
- 0 watching
- 0 forks

Releases

No releases published
Create a new release

Packages

No packages published
Publish your first package



Dashboard > Micro-Service-Project > Configuration

Configuration

General

Enabled

Display Name ?

Description

Plain text Preview

Branch Sources

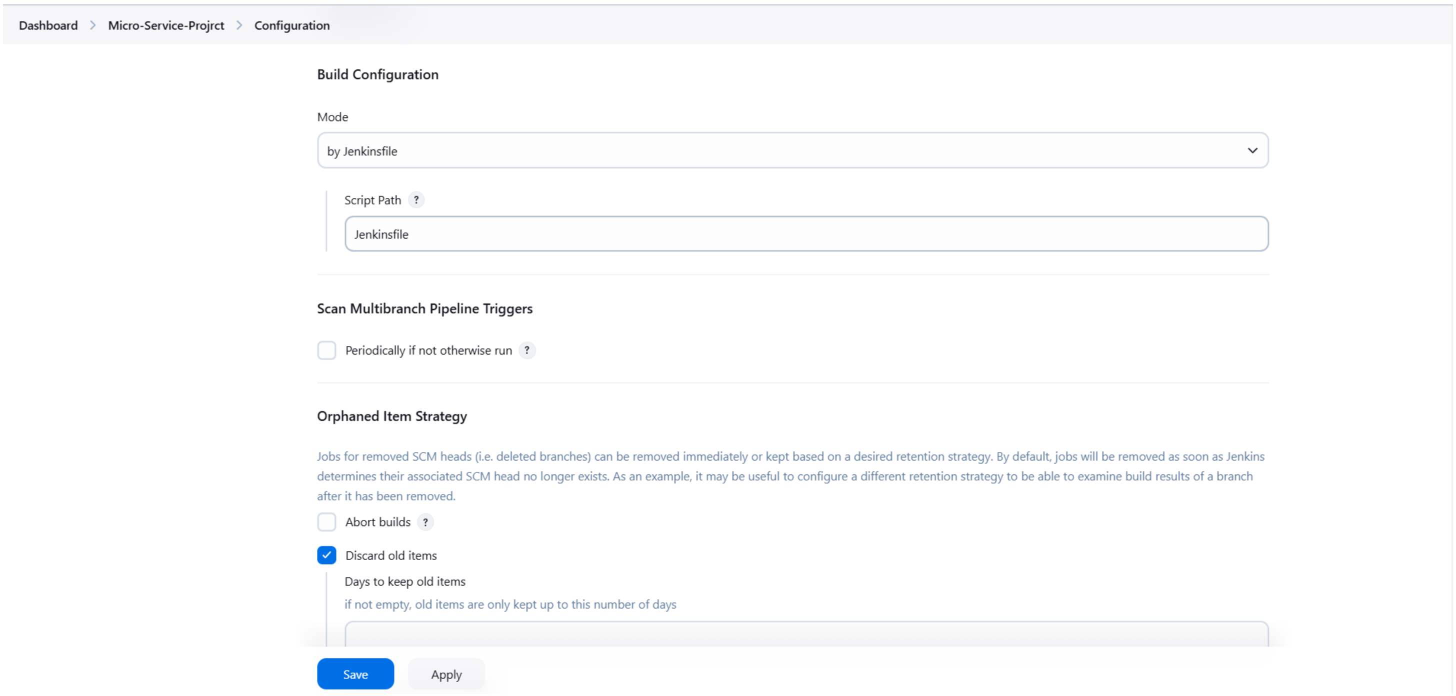
Git

Project Repository ?

https://github.com/Lalit-Mahajan/microservices-project.git

Credentials ?

- none -


Dashboard > Micro-Service-Projrct > Configuration

Build Configuration

Mode

by Jenkinsfile

Script Path ?

Jenkinsfile

Scan Multibranch Pipeline Triggers

□ Periodically if not otherwise run ?

Orphaned Item Strategy

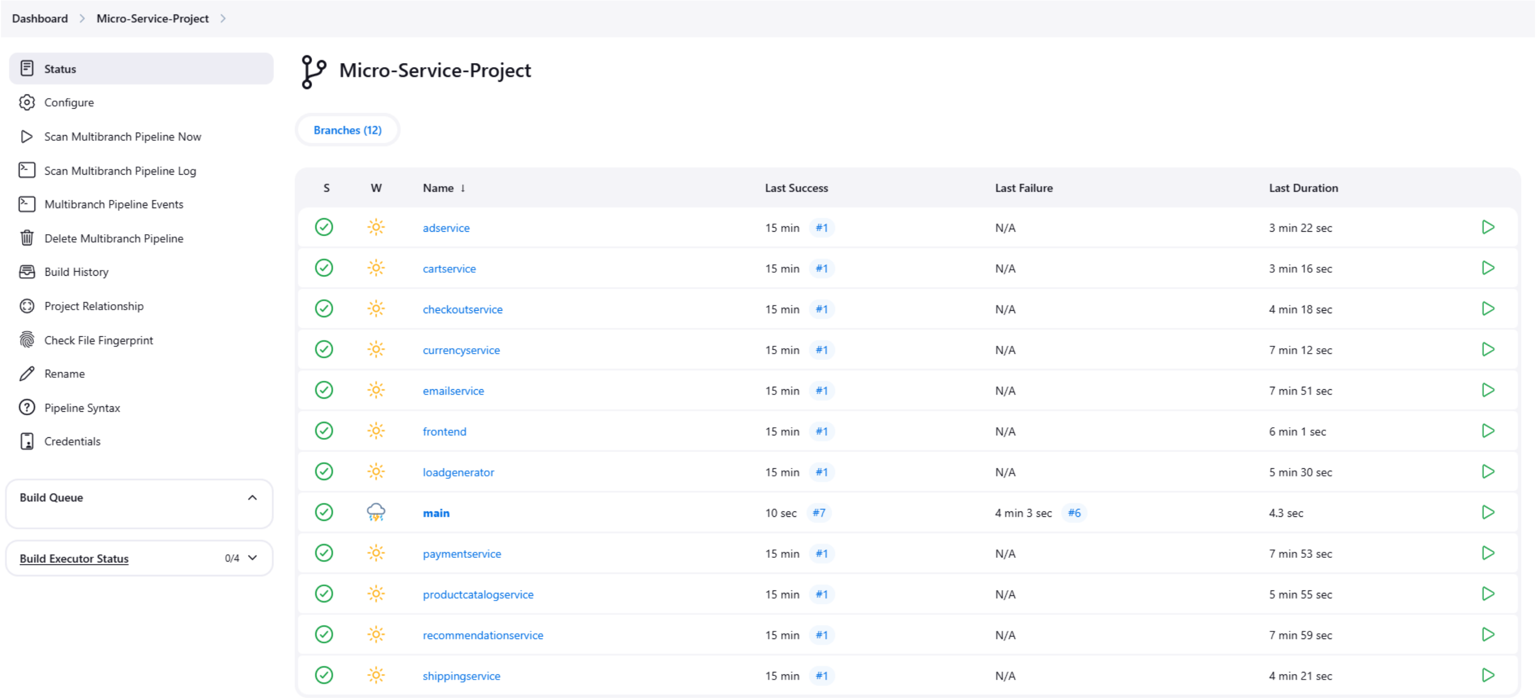
Jobs for removed SCM heads (i.e. deleted branches) can be removed immediately or kept based on a desired retention strategy. By default, jobs will be removed as soon as Jenkins determines their associated SCM head no longer exists. As an example, it may be useful to configure a different retention strategy to be able to examine build results of a branch after it has been removed.

□ Abort builds ?

☑ Discard old items

Days to keep old items

if not empty, old items are only kept up to this number of days

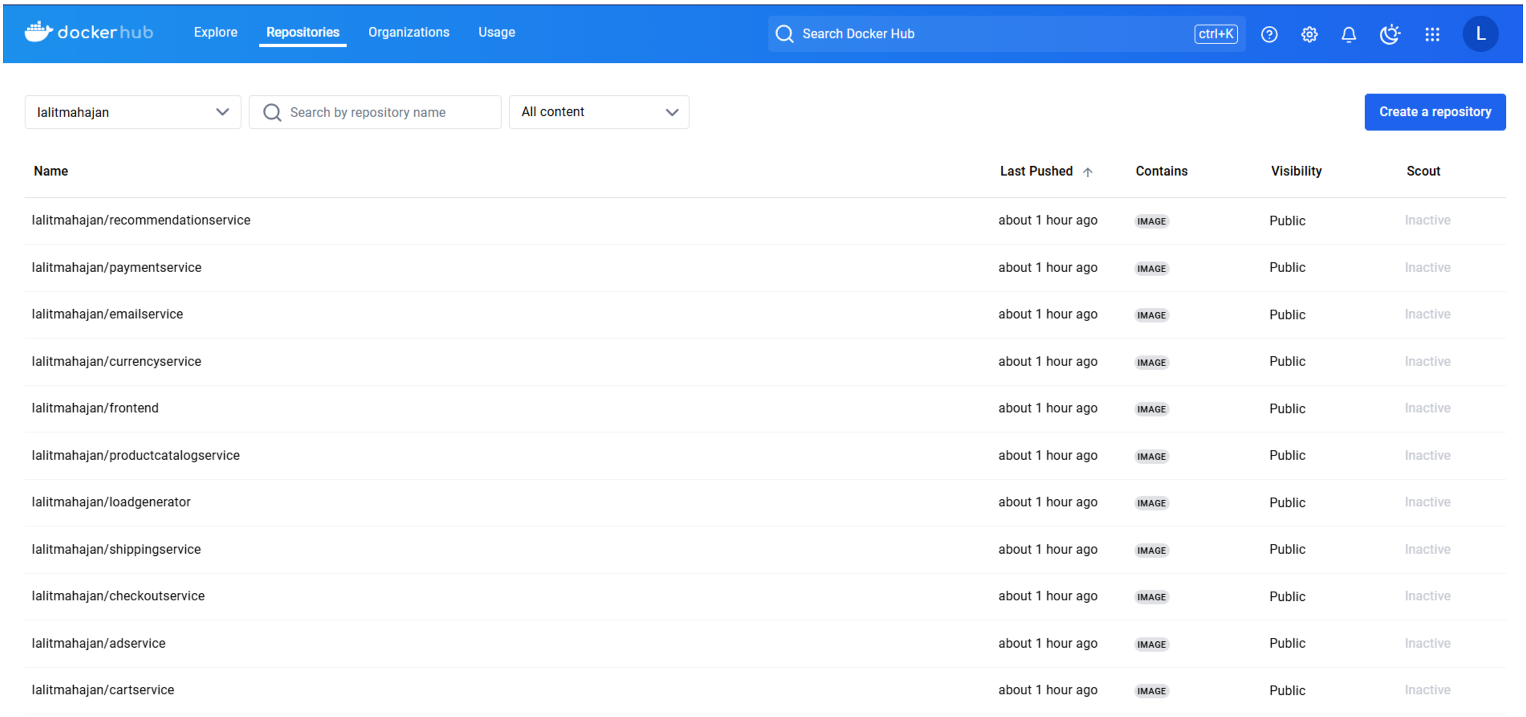


Dashboard > Micro-Service-Project >
Status
Configure
Scan Multibranch Pipeline Now
Scan Multibranch Pipeline Log
Multibranch Pipeline Events
Delete Multibranch Pipeline
Build History
Project Relationship
Check File Fingerprint
Rename
Pipeline Syntax
Credentials
Build Queue
Build Executor Status 0/4

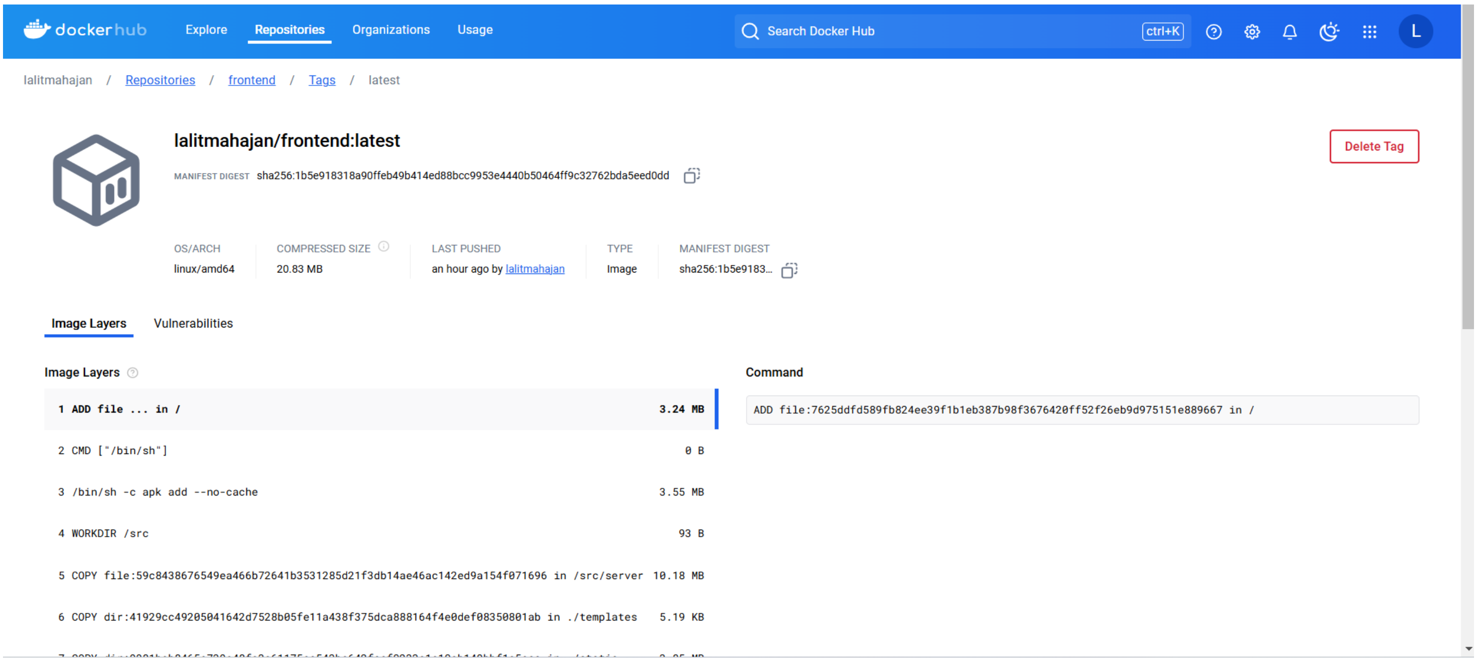
Micro-Service-Project

Branches (12)

S	W	Name ↓	Last Success	Last Failure	Last Duration
✓	☀	adservice	15 min #1	N/A	3 min 22 sec
✓	☀	cartservice	15 min #1	N/A	3 min 16 sec
✓	☀	checkoutservice	15 min #1	N/A	4 min 18 sec
✓	☀	currencyservice	15 min #1	N/A	7 min 12 sec
✓	☀	emailservice	15 min #1	N/A	7 min 51 sec
✓	☀	frontend	15 min #1	N/A	6 min 1 sec
✓	☀	loadgenerator	15 min #1	N/A	5 min 30 sec
✓	☁	**main**	10 sec #7	4 min 3 sec #6	4.3 sec
✓	☀	paymentservice	15 min #1	N/A	7 min 53 sec
✓	☀	productcatalogservice	15 min #1	N/A	5 min 55 sec
✓	☀	recommendationservice	15 min #1	N/A	7 min 59 sec
✓	☀	shippingservice	15 min #1	N/A	4 min 21 sec



Name	Last Pushed ↑	Contains	Visibility	Scout
lalitmahajan/recommendationservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/paymentservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/emailservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/currencyservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/frontend	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/productcatalogservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/loadgenerator	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/shippingservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/checkoutservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/adservice	about 1 hour ago	IMAGE	Public	Inactive
lalitmahajan/cartservice	about 1 hour ago	IMAGE	Public	Inactive



lalitmahajan/frontend:latest

MANIFEST DIGEST sha256:1b5e918318a90ffeb49b414ed88bcc9953e4440b50464ff9c32762bda5eed0dd

OS/ARCH	COMPRESSED SIZE	LAST PUSHED	TYPE	MANIFEST DIGEST
linux/amd64	20.83 MB	an hour ago by lalitmahajan	Image	sha256:1b5e9183...

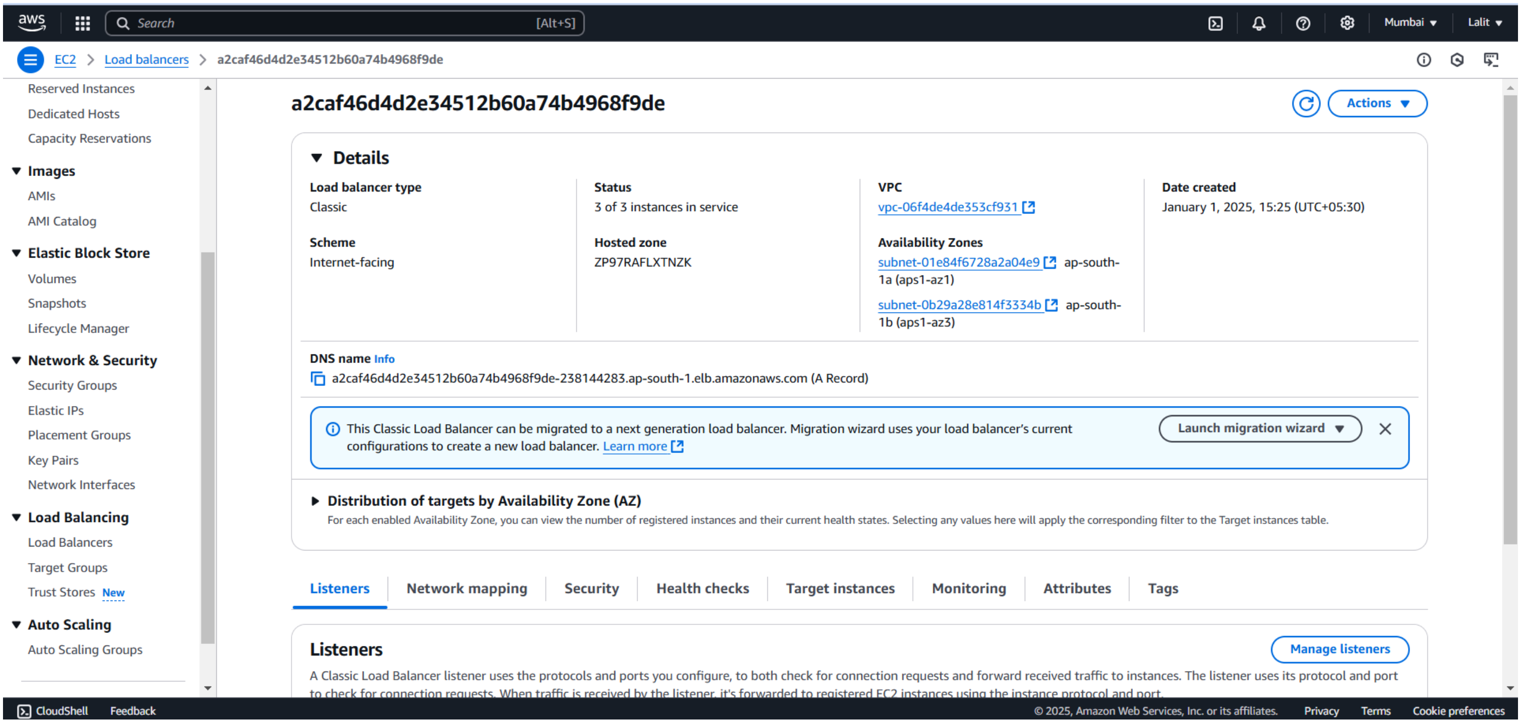
Image Layers

```
1 ADD file ... in /                                                                     3.24 MB
2 CMD ["/bin/sh"]                                                                           0 B
3 /bin/sh -c apk add --no-cache                                                         3.55 MB
4 WORKDIR /src                                                                             93 B
5 COPY file:59c8438676549ea466b72641b3531285d21f3db14ae46ac142ed9a154f071696 in /src/server 10.18 MB
6 COPY dir:41929cc49205041642d7528b05fe11a438f375dca888164f4e0def08350801ab in ./templates   5.19 KB
```

Command

```
ADD file:7625ddfd589fb824ee39f1b1eb387b98f3676420ff52f26eb9d975151e889667 in /
```

Load Balancer



a2caf46d4d2e34512b60a74b4968f9de

Details

Load balancer type: Classic

Status: 3 of 3 instances in service

VPC: vpc-06f4de4de353cf931

Date created: January 1, 2025, 15:25 (UTC+05:30)

Scheme: Internet-facing

Hosted zone: ZP97RAFLXTNZK

Availability Zones: subnet-01e84f6728a2a04e9 ap-south-1a (aps1-az1); subnet-0b29a28e814f3334b ap-south-1b (aps1-az3)

DNS name Info: a2caf46d4d2e34512b60a74b4968f9de-238144283.ap-south-1.elb.amazonaws.com (A Record)

This Classic Load Balancer can be migrated to a next generation load balancer. Migration wizard uses your load balancer's current configurations to create a new load balancer. Learn more

Distribution of targets by Availability Zone (AZ)

For each enabled Availability Zone, you can view the number of registered instances and their current health states. Selecting any values here will apply the corresponding filter to the Target instances table.

Listeners

A Classic Load Balancer listener uses the protocols and ports you configure, to both check for connection requests and forward received traffic to instances. The listener uses its protocol and port to check for connection requests. When traffic is received by the listener, it's forwarded to registered EC2 instances using the instance protocol and port.

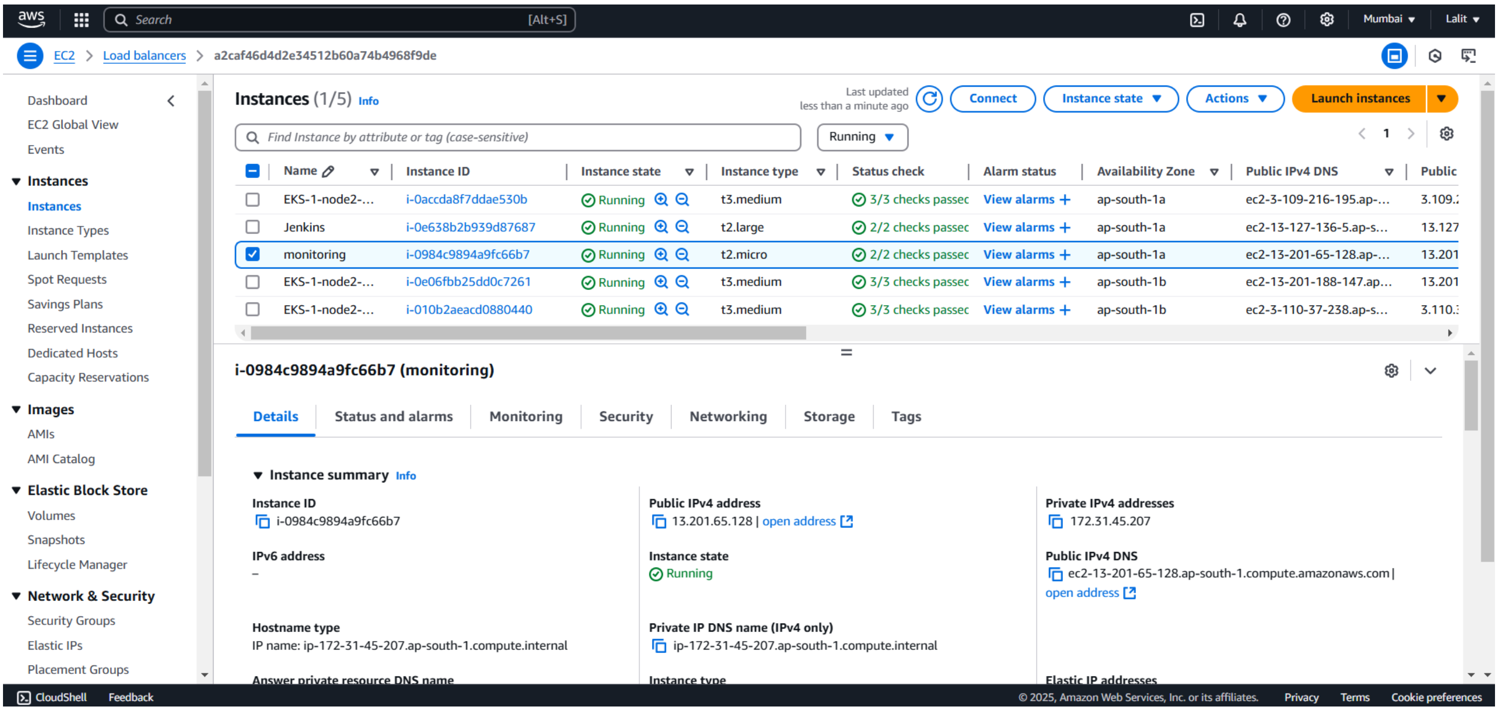
Step 11: Monitoring Prometheus with Grafana

1. **Install Components:**
   Install Grafana, Prometheus, and Node Exporter on the monitoring server.

2. **Access Grafana:**
   Port: 3000, Username/Password: admin/admin.

3. **Connect Prometheus to Grafana:**
   Navigate to Data Sources → Add Prometheus → Enter Prometheus URL → Save & Test.

4. **Import Dashboard:**
   Click + → Import → Enter Dashboard ID 1860 → Load → Select Prometheus → Import



Instances (1/5) Info

Find Instance by attribute or tag (case-sensitive)

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public
□	EKS-1-node2-...	i-0accda8f7ddae530b	Running	t3.medium	3/3 checks passec	View alarms +	ap-south-1a	ec2-3-109-216-195.ap-...	3.109.:
□	Jenkins	i-0e638b2b939d87687	Running	t2.large	2/2 checks passec	View alarms +	ap-south-1a	ec2-13-127-136-5.ap-s...	13.127
☑	monitoring	i-0984c9894a9fc66b7	Running	t2.micro	2/2 checks passec	View alarms +	ap-south-1a	ec2-13-201-65-128.ap-...	13.201
□	EKS-1-node2-...	i-0e06fbb25dd0c7261	Running	t3.medium	3/3 checks passec	View alarms +	ap-south-1b	ec2-13-201-188-147.ap...	13.201
□	EKS-1-node2-...	i-010b2aeacd0880440	Running	t3.medium	3/3 checks passec	View alarms +	ap-south-1b	ec2-3-110-37-238.ap-s...	3.110.:

i-0984c9894a9fc66b7 (monitoring)

Instance summary Info

Instance ID
i-0984c9894a9fc66b7

Public IPv4 address
13.201.65.128 | open address

Private IPv4 addresses
172.31.45.207

IPv6 address
–

Instance state
Running

Public IPv4 DNS
ec2-13-201-65-128.ap-south-1.compute.amazonaws.com | open address

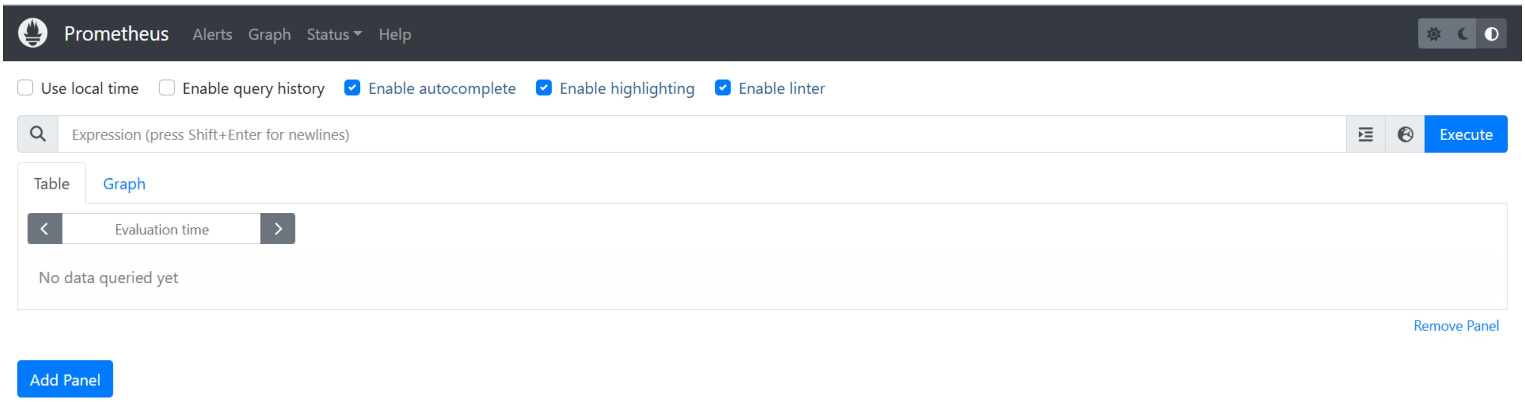
Hostname type
IP name: ip-172-31-45-207.ap-south-1.compute.internal

Private IP DNS name (IPv4 only)
ip-172-31-45-207.ap-south-1.compute.internal

Answer private resource DNS name

Instance type

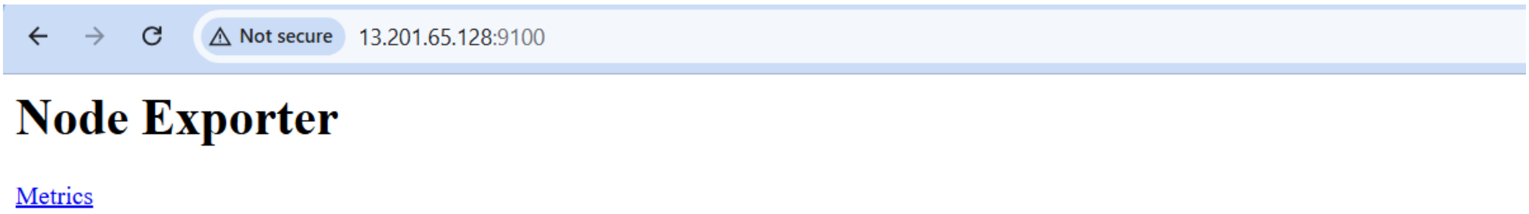
Elastic IP addresses



□ Use local time □ Enable query history ☑ Enable autocomplete ☑ Enable highlighting ☑ Enable linter

Expression (press Shift+Enter for newlines)

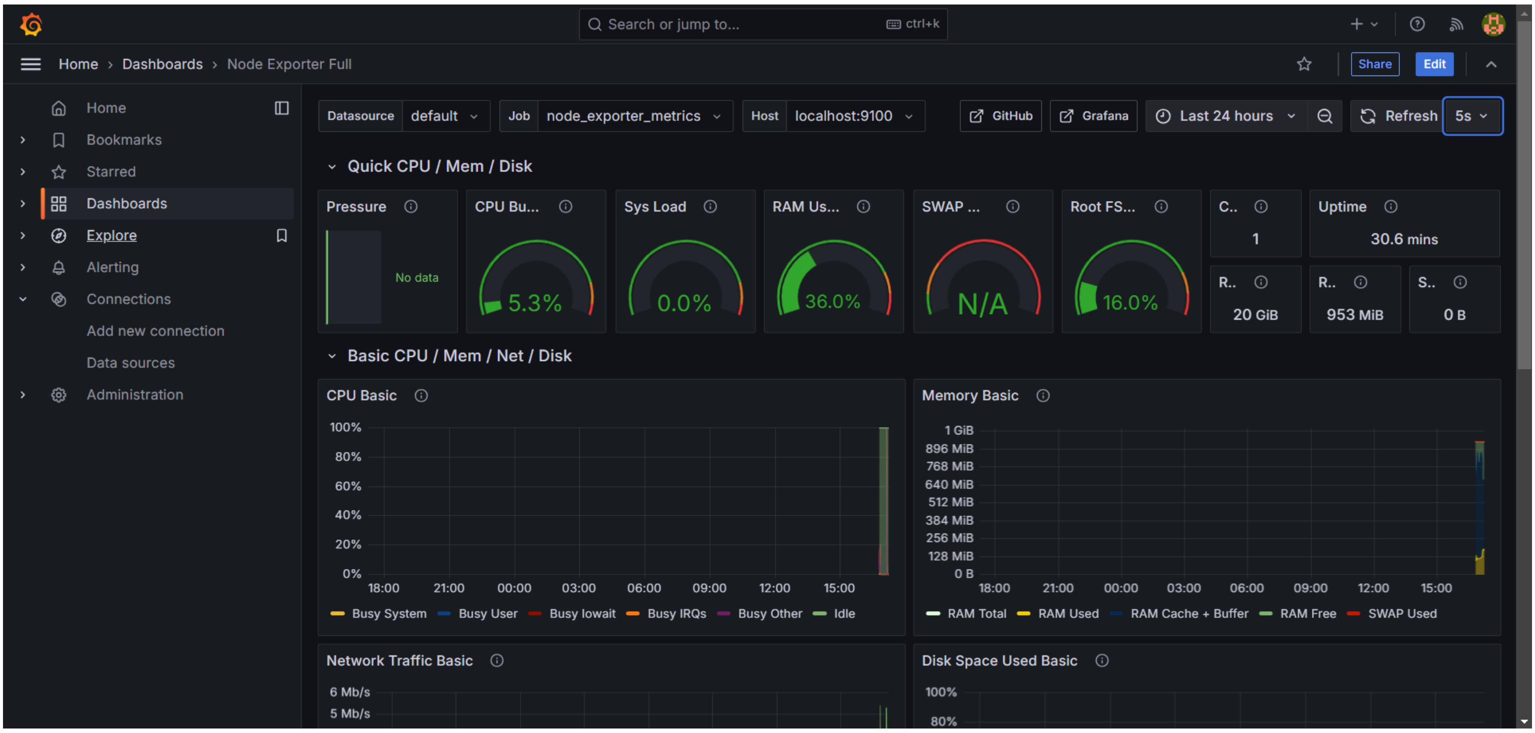
No data queried yet



13.201.65.128:9100

Node Exporter

Metrics



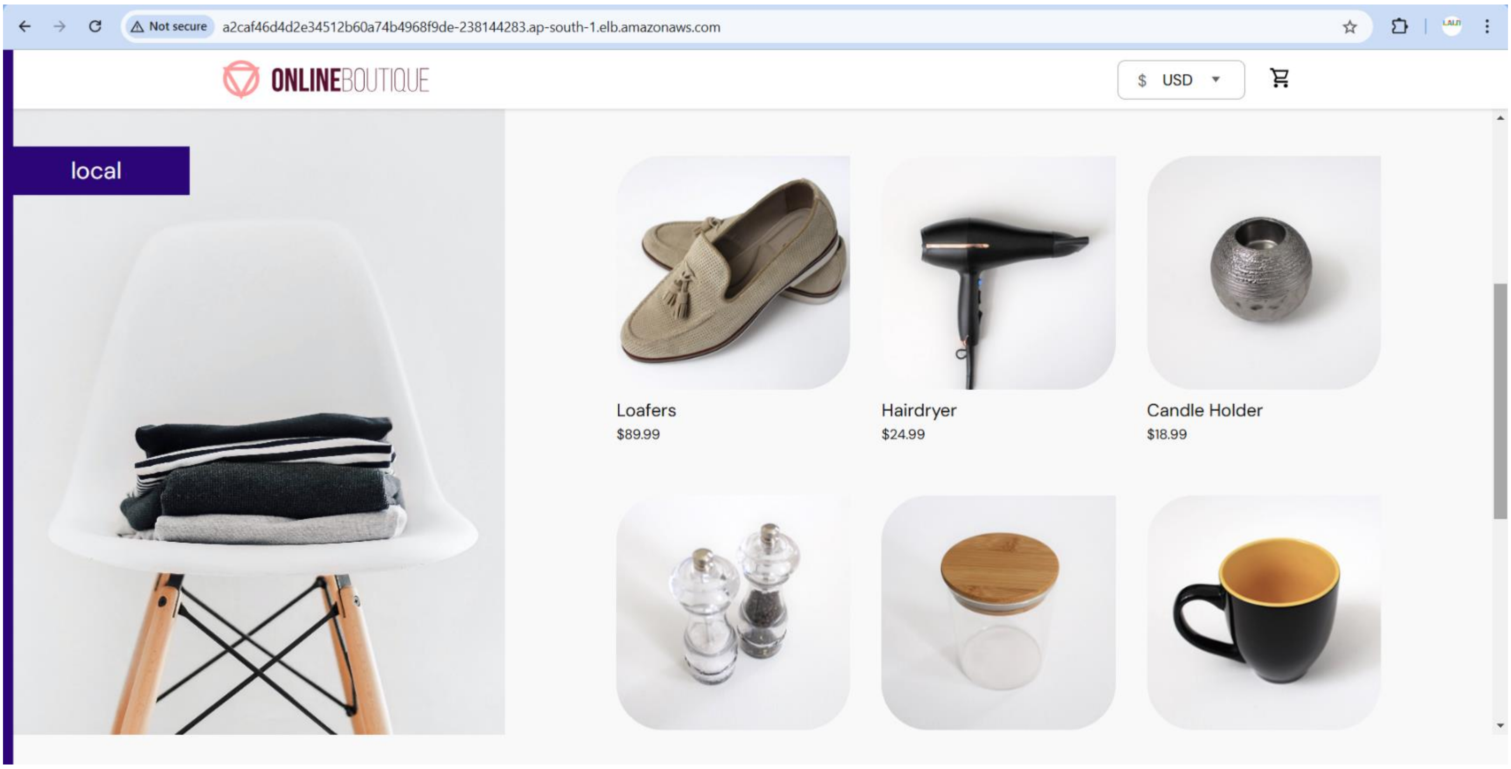
Home > Dashboards > Node Exporter Full

Datasource default | Job node_exporter_metrics | Host localhost:9100 | Last 24 hours | Refresh 5s

Quick CPU / Mem / Disk

Basic CPU / Mem / Net / Disk

OUTPUT:

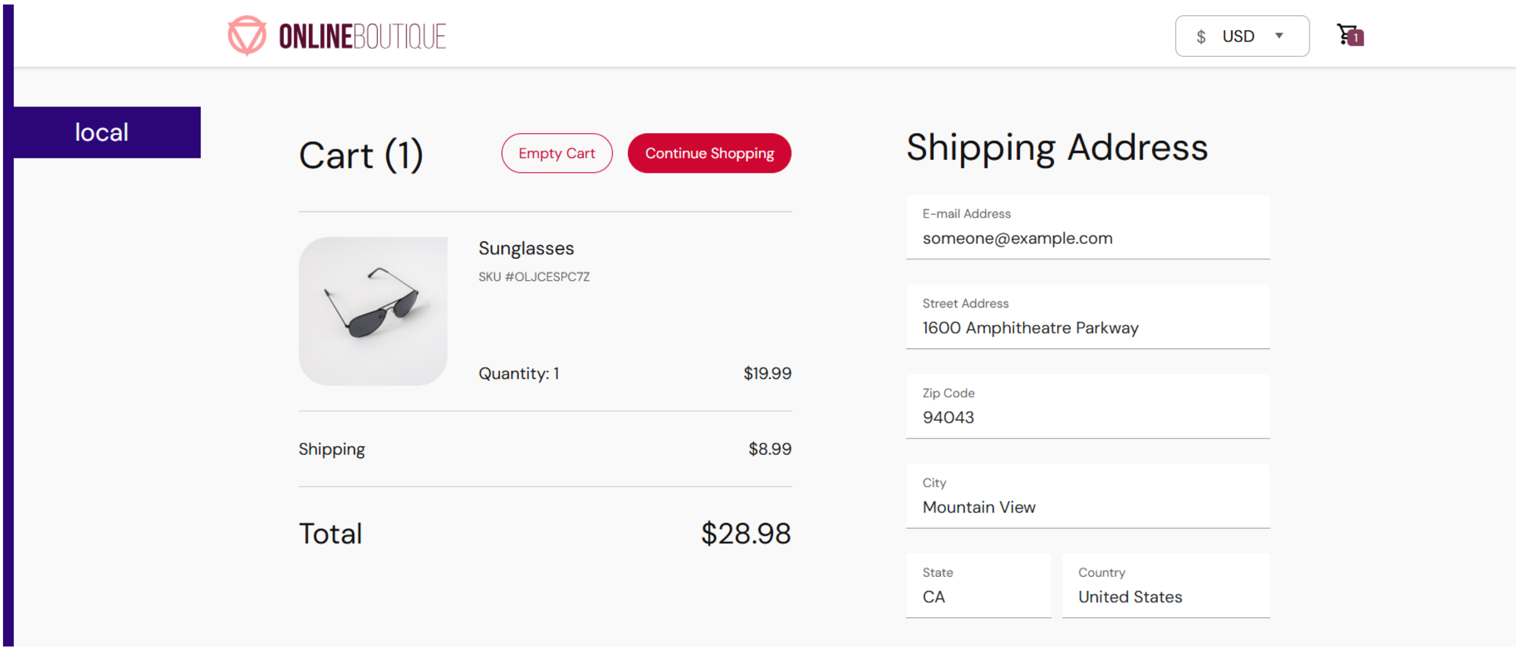


a2caf46d4d2e34512b60a74b4968f9de-238144283.ap-south-1.elb.amazonaws.com

Loafers
$89.99

Hairdryer
$24.99

Candle Holder
$18.99



Cart (1)

Sunglasses
SKU #OLJCESPC7Z

Quantity: 1 $19.99

Shipping $8.99

Total $28.98

Shipping Address

E-mail Address
someone@example.com

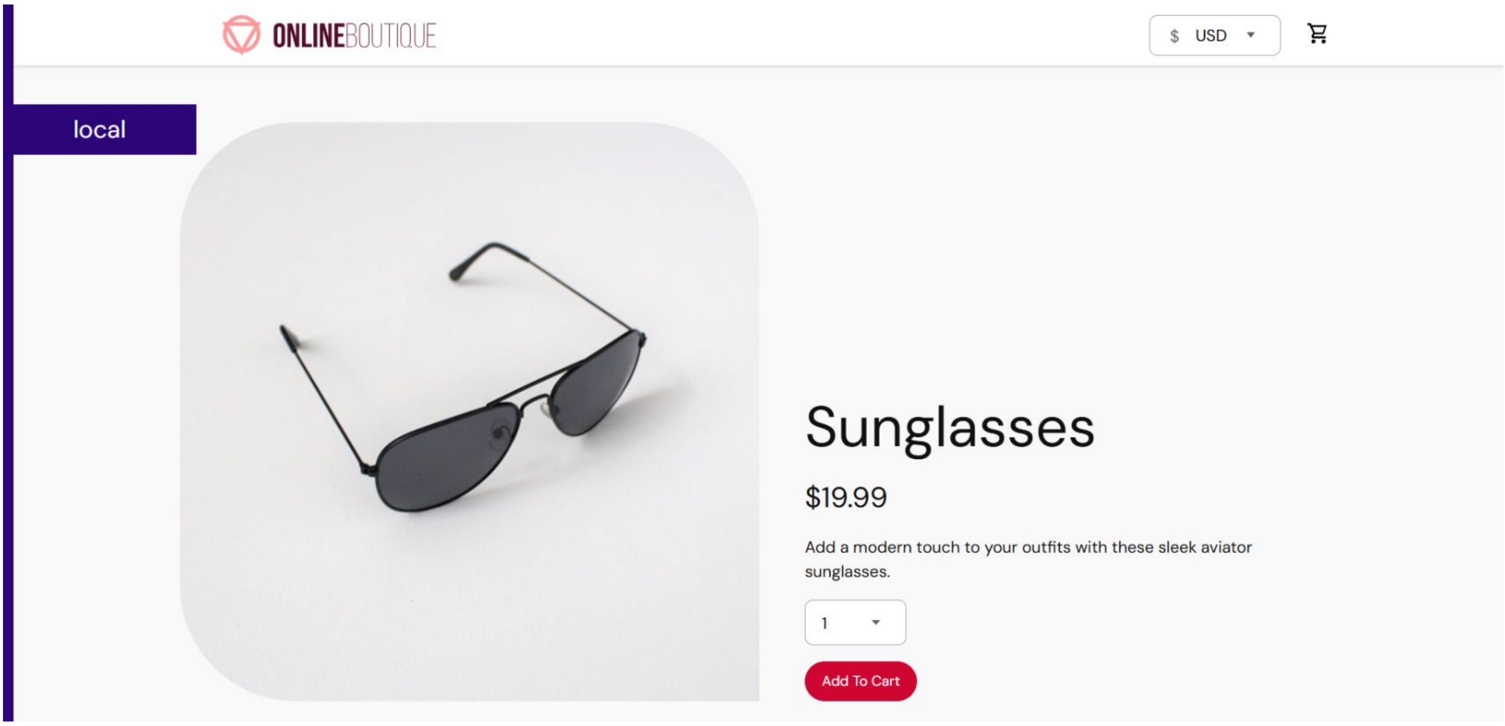
Street Address
1600 Amphitheatre Parkway

Zip Code
94043

City
Mountain View

State
CA

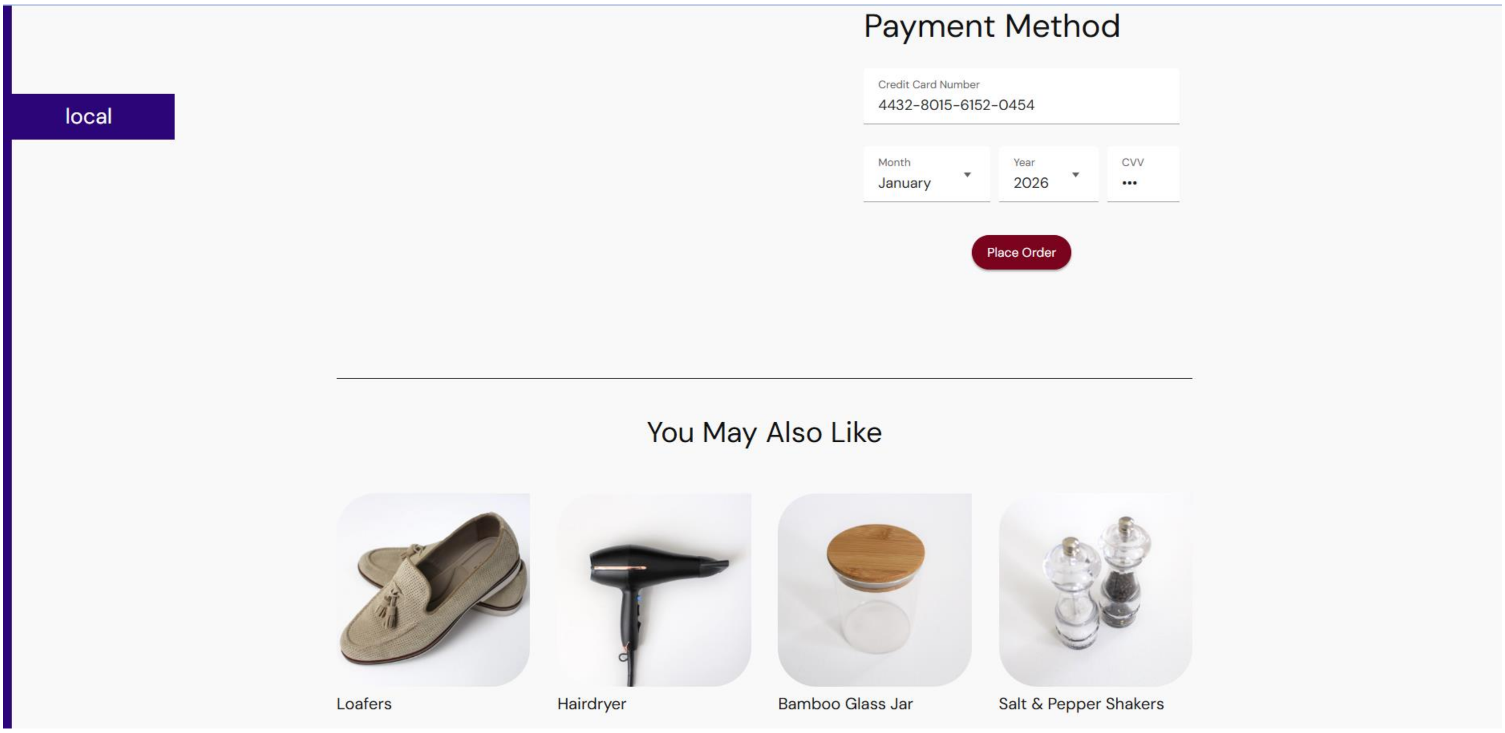
Country
United States



Sunglasses

$19.99

Add a modern touch to your outfits with these sleek aviator sunglasses.



Payment Method

Credit Card Number: 4432-8015-6152-0454

Month: January

Year: 2026

CVV: •••

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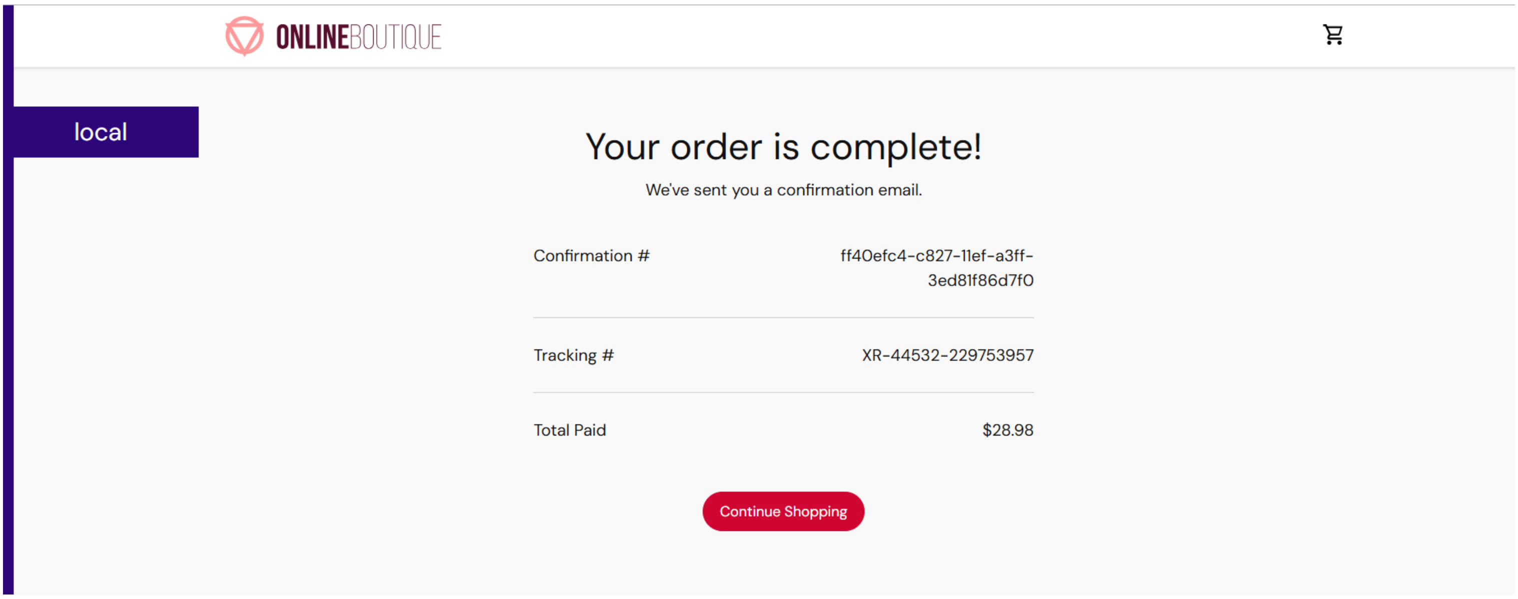

Your order is complete!

We've sent you a confirmation email.

Confirmation #	ff40efc4-c827-11ef-a3ff-3ed81f86d7f0
Tracking #	XR-44532-229753957
Total Paid	$28.98