

## Kubernetes Task-2

### Task Description:

Create the K8s EKS, further you have to do the deployment of the Nginx application and access the application outside the cluster.

### Techstacks needs to be used :

- AWS EKS
- EKSCtl
- Kubectl

Ensure to have:

- AWS CLI installed and configured
- eksctl installed
- kubectl installed

Creating K8s EKS cluster:

```
$ eksctl create cluster \
  --name nginx-cluster \
  --region us-east-1 \
  --nodegroup-name nginx-nodes \
  --node-type t3.small \
  --nodes 1 \
  --nodes-min 1 \
  --nodes-max 1 \
  --managed
2026-02-17 16:34:57 [i] eksctl version 0.221.0
2026-02-17 16:34:57 [i] using region us-east-1
2026-02-17 16:35:06 [i] setting availability zones to [us-east-1d us-east-1b]
2026-02-17 16:35:06 [i] subnets for us-east-1d - public:192.168.0.0/19 private:192.168.64.0/19
2026-02-17 16:35:06 [i] subnets for us-east-1b - public:192.168.32.0/19 private:192.168.96.0/19
2026-02-17 16:35:06 [i] nodegroup "nginx-nodes" will use "" [AmazonLinux2023/1.32]
2026-02-17 16:35:06 [i] Auto Mode will be enabled by default in an upcoming release of eksctl. This means managed node groups and managed networking add-ons will no longer be created.
  set 'autoModeConfig.enabled: false' in your cluster configuration. Learn more: https://eksctl.io/usage/auto-mode/
2026-02-17 16:35:06 [i] using Kubernetes version 1.32
2026-02-17 16:35:06 [i] creating EKS cluster "nginx-cluster" in "us-east-1" region with managed nodes
2026-02-17 16:35:06 [i] will create 2 separate CloudFormation stacks for cluster itself and the initial managed nodegroup
2026-02-17 16:35:06 [i] if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=us-east-1 --cluster=nginx-cluster'
2026-02-17 16:35:06 [i] Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "nginx-cluster" in "us-east-1"
2026-02-17 16:35:06 [i] Cloudwatch logging will not be enabled for cluster "nginx-cluster" in "us-east-1"
2026-02-17 16:35:06 [i] you can enable it with 'eksctl utils update-cluster-logging --enable-types=[SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)] --region=us-east-1 --cluster=nginx-cluster'
2026-02-17 16:35:06 [i] default add-ons coredns, metrics-server, vpc-cni, kube-proxy were not specified, will install them as EKS add-ons
2026-02-17 16:35:06 [i]
2 sequential tasks: { create cluster control plane "nginx-cluster",
  2 sequential sub-tasks: {
    2 sequential sub-tasks: {
      1 task: { create addons },
      wait for control plane to become ready,
    },
    create managed nodegroup "nginx-nodes",
  },
}
2026-02-17 16:35:06 [i] building cluster stack "eksctl-nginx-cluster-cluster"
2026-02-17 16:35:14 [i] deploying stack "eksctl-nginx-cluster-cluster"
2026-02-17 16:35:44 [i] waiting for CloudFormation stack "eksctl-nginx-cluster-cluster"
2026-02-17 16:36:21 [i] waiting for CloudFormation stack "eksctl-nginx-cluster-cluster"
2026-02-17 16:37:27 [i] waiting for CloudFormation stack "eksctl-nginx-cluster-cluster"
2026-02-17 16:38:41 [i] waiting for CloudFormation stack "eksctl-nginx-cluster-cluster"
```

```

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ eksctl get cluster
NAME          REGION    EKSCTL CREATED
nginx-cluster  us-east-1  True

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get nodes
NAME                                STATUS    ROLES    AGE    VERSION
ip-192-168-3-239.ec2.internal      Ready    <none>   7m3s   v1.32.11-eks-70ce843

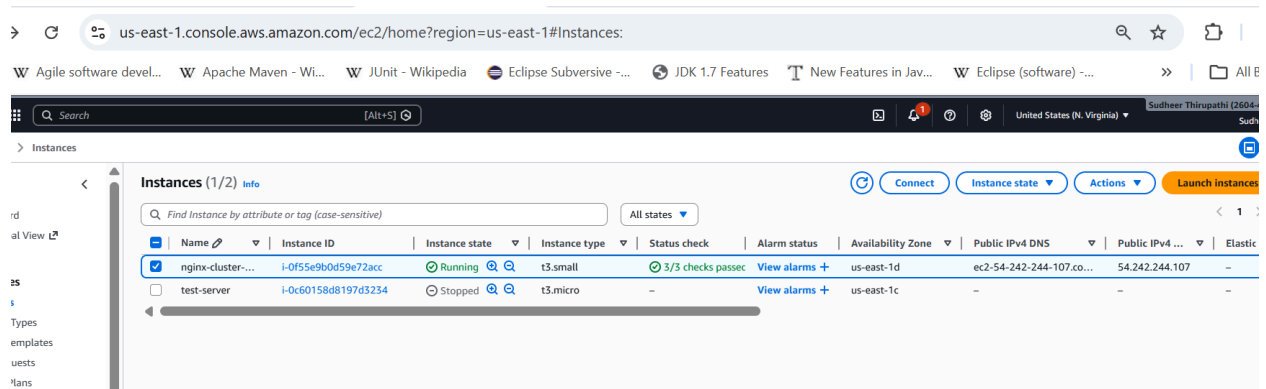
hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)

```

This will create VPC,EKS control plane,worker nodes,cloud formation stack,build the managed node group stack.

The screenshot shows the AWS Management Console for the 'nginx-cluster'. At the top, there's a notification bar indicating a new Kubernetes version is available. Below this, the cluster name 'nginx-cluster' is displayed with buttons for 'Delete cluster', 'Upgrade version', and 'Monitor cluster'. A warning message states that the current Kubernetes version (1.32) will reach the end of standard support on March 23, 2026. The 'Cluster info' section shows the status as 'Active', Kubernetes version 1.32, and a support period ending on March 23, 2026. It also displays cluster health, upgrade insights, node health issues, and capability issues, all with green checkmarks and a count of 0. The 'Compute' tab is selected, showing a list of nodes (0) with a search filter.

The screenshot shows the AWS Management Console for the 'CloudFormation' page. At the top, there's a notification bar indicating that termination protection was successfully changed for the stack. Below this, the 'Stacks (2)' section is displayed with buttons for 'Delete', 'Update stack', 'Stack actions', and 'Create'. A search filter is provided for the stack name. The table lists two stacks: 'eksctl-nginx-cluster-nodegroup-nginx-nodes' and 'eksctl-nginx-cluster-cluster', both with a status of 'CREATE\_COMPLETE'. The 'Created time' column shows the creation time for each stack, and the 'Description' column provides details about the stacks.



Creating deployment:

```
hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl create deployment nginx-deployment --image=nginx
deployment.apps/nginx-deployment created

hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-6cfb98644c-v2cvn   1/1     Running   0           66s
```

Expose Nginx Outside the Cluster:

```
hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl expose deployment nginx-deployment \
  --port=80 \
  --type=LoadBalancer
service/nginx-deployment exposed

hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get pods --show-labels
error: unknown flag: --show-labels
See 'kubectl get --help' for usage.

hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get pods --show-labels
NAME                                READY   STATUS    RESTARTS   AGE   LABELS
nginx-deployment-6cfb98644c-v2cvn   1/1     Running   0           5m39s   app=nginx-deployment,pod-template-hash=6cfb98644c

hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get deployments
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment  1/1     1             1           6m56s

hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get svc
bash: '$[200-kubectl]': command not found

hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get svc
NAME          TYPE          CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
kubernetes    ClusterIP     10.100.0.1    <none>         443/TCP           28m
nginx-deployment  LoadBalancer 10.100.53.19  af7b5c911674643d1bc4244af8668742-1706948639.us-east-1.elb.amazonaws.com 80:30214/TCP 4m40s
```

Load balancer created automatically:

ancers

Load balancers (1) [What's new?](#)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

| <input type="checkbox"/> | Name                   | State | Type    | Scheme | IP address type | VPC ID                | Availability Zones   | Security groups        | DNS name         |
|--------------------------|------------------------|-------|---------|--------|-----------------|-----------------------|----------------------|------------------------|------------------|
| <input type="checkbox"/> | af7b5c911674643d1bc... | -     | classic | -      | -               | vpc-07dcf613b40e1919a | 2 Availability Zones | sg-09555b8097410214... | af7b5c9116746... |

## Access the Nginx application through browser(outside the cluster):

→ ↺ ⚠ Not secure af7b5c911674643d1bc4244af8668742-1706948639.us-east-1.elb.amazonaws.com

W Agile software devel... W Apache Maven - Wi... W JUnit - Wikipedia W Eclipse Subversive ... S JDK 1.7 Features T New Features in Jav... W

# Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](http://nginx.org).  
Commercial support is available at [nginx.com](http://nginx.com).

*Thank you for using nginx.*

## Accessing through terminal:

```
hp@LAPTOP-M939AS8F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ curl http://af7b5c911674643d1bc4244af8668742-1706948639.us-east-1.elb.amazonaws.com
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
```

## YAML Based Deployment:

Create nginx-deployment1.yaml:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment1
spec:
  replicas: 2
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx
          ports:
            - containerPort: 80
```

```
hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ vi nginx-deployment1.yaml

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl apply -f nginx-deployment1.yaml
deployment.apps/nginx-deployment1 created
```

Creating nginx-service.yaml:

```
apiVersion: v1
kind: Service
metadata:
  name: nginx-service
spec:
  type: LoadBalancer
  selector:
    app: nginx
  ports:
    - port: 80
      targetPort: 80
```

```
hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ vi nginx-service.yaml

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl apply -f nginx-service.yaml
service/nginx-service created

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    1/1     1             1           33m
nginx-deployment1   2/2     2             2           4m16s

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get pods --show-labels
NAME                                READY   STATUS    RESTARTS   AGE   LABELS
nginx-deployment-6cfb98644c-v2cyn   1/1     Running   0          34m   app=nginx-deployment,pod-template-hash=6cfb98644c
nginx-deployment1-86c57bc6b8-5ndjg  1/1     Running   0          5m7s   app=nginx,pod-template-hash=86c57bc6b8
nginx-deployment1-86c57bc6b8-gws4f  1/1     Running   0          5m7s   app=nginx,pod-template-hash=86c57bc6b8

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
$ kubectl get svc
NAME                TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes          ClusterIP   10.100.0.1       <none>            443/TCP          56m
nginx-deployment    LoadBalancer 10.100.53.19     af7b5c911674643d1bc4244af8668742-1706948639.us-east-1.elb.amazonaws.com 80:30214/TCP    31m
nginx-service       LoadBalancer 10.100.19.121    adadbc42b8ec14b01bbc109335aa4e40-1675289414.us-east-1.elb.amazonaws.com 80:31260/TCP    2m24s

hp@LAPTOP-M939A58F MINGW64 ~/OneDrive/Desktop/Company/code/Guvi-Tasks (main)
```

Load balancers (2) [What's new?](#)

⌂ Actions

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

| <input type="checkbox"/> | Name                   | State | Type    | Scheme | IP address type | VPC ID                | Availability Zones   | Security grou |
|--------------------------|------------------------|-------|---------|--------|-----------------|-----------------------|----------------------|---------------|
| <input type="checkbox"/> | adadbc42b8ec14b01bb... | -     | classic | -      | -               | vpc-07dcf613b40e1919a | 2 Availability Zones | sg-07896f72a  |
| <input type="checkbox"/> | af7b5c911674643d1bc... | -     | classic | -      | -               | vpc-07dcf613b40e1919a | 2 Availability Zones | sg-09555b80f  |

Accessing nginx-deployment1 from browser:

# Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](http://nginx.org).  
Commercial support is available at [nginx.com](http://nginx.com).

*Thank you for using nginx.*

## Accessing Nginx-Service from browser:

# Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](http://nginx.org).  
Commercial support is available at [nginx.com](http://nginx.com).

*Thank you for using nginx.*