



Dhirubhai Ambani University Technology

Formerly DA-IICT

IT457 Cloud Computing

Assignment - Amazon EKS (Elastic Kubernetes Service)

Group 5

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Region Used : us-east-1

Configure AWS CLI with EKS Admin User

```
MINGW64/c/Users/neelp
neelp@GeorgeBush MINGW64 ~ (master)
$ aws configure
AWS Access Key ID [*****]: AKIAQ60CBNN4GB5C0607
AWS Secret Access Key [*****]: hvoaa/s180TL5xBr1gEVgn0HKSy/vGRrhkv5wyz
Default region name [AWS Secret Access Key None]: hvoaa/s180TL5xBr1gEVgn0HKSy/vGRrhkv5wyz: us-east-1
Default output format [Default region name None]: us-east-1; table

neelp@GeorgeBush MINGW64 ~ (master)
$ aws --config
[default]
region = us-east-1
output = table

neelp@GeorgeBush MINGW64 ~ (master)
$ mv ~/Downloads/eks-spore.pem ~/.ssh
neelp@GeorgeBush MINGW64 ~ (master)
$ ls -al ~/.ssh/eks-spore.pem
-rw-r--r-- 1 neelp 197609 1678 Nov  8 02:30 /c/Users/neelp/.ssh/eks-spore.pem

neelp@GeorgeBush MINGW64 ~ (master)
$ chmod 600 ~/.ssh/eks-spore.pem
neelp@GeorgeBush MINGW64 ~ (master)
$ ls -al ~/.ssh/eks-spore.pem
-rw-r--r-- 1 neelp 197609 1678 Nov  8 02:30 /c/Users/neelp/.ssh/eks-spore.pem

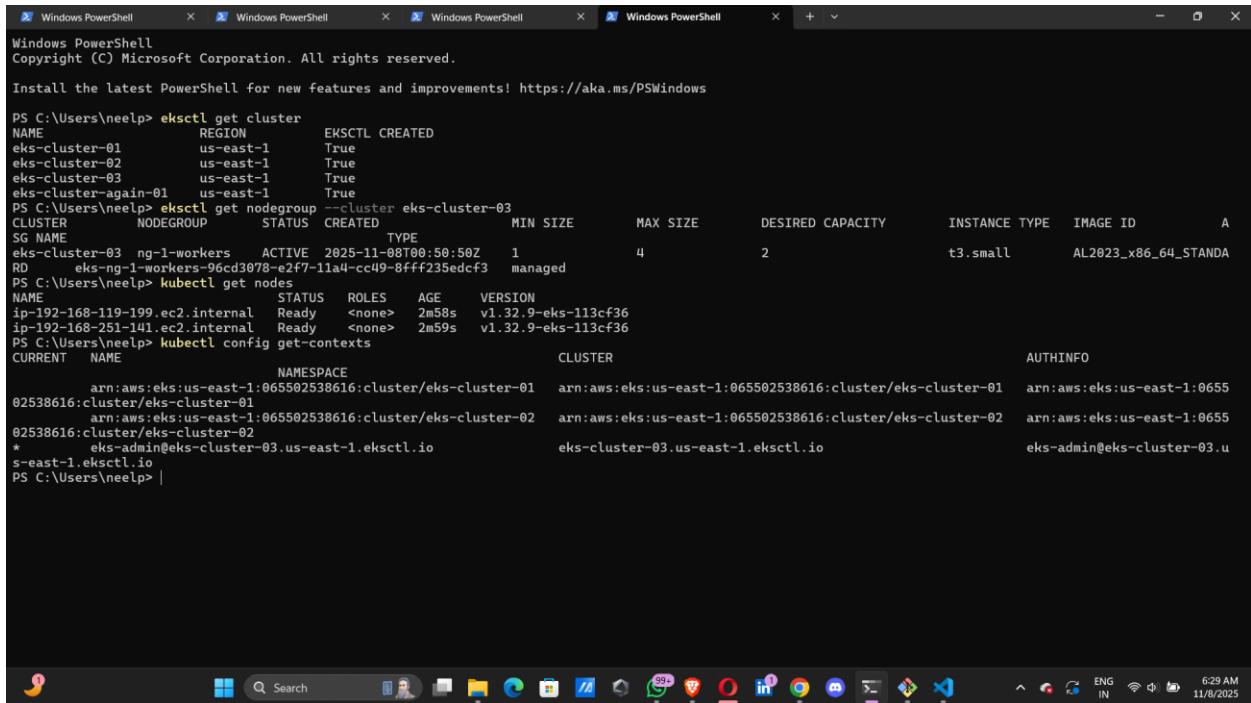
neelp@GeorgeBush MINGW64 ~ (master)
$
```

Creation of EKS cluster using eksctl

```
PS C:\Users\meelp> eksctl create cluster --region us-east-1
2023-11-08 06:08:21 [ ] using region us-east-1
2023-11-08 06:08:21 [ ] using existing VPC (vpcid:09d9793deec12b52ee us-east-1:192.168.64.0/16 0 us-east-1b:[subnet-0997c4607ec0ba212 us-east-1b:192.168.128.0/16 0] us-east-1c:[subnet-0e940053901d0056 us-east-1c:192.168.192.0/16 0])
2023-11-08 06:08:21 [ ] nodegroup "mg-1-workers" will use "" [AmazonLinux2023/1.32]
2023-11-08 06:08:21 [ ] note: this command will update or replace all existing cluster addons. Read more to review the configuration of your addons
2023-11-08 06:08:21 [ ] note: managed node groups and managed networking add-ons will no longer be created by default. To maintain current behavior, explicitly set "autoUpdateConfig.enabled: false" in your cluster configuration. Learn more
2023-11-08 06:08:21 [ ] note: Node.js will be available in an upcoming release of eksctl. This means managed node groups and managed networking add-ons will no longer be created by default. To maintain current behavior, explicitly set "autoUpdateConfig.enabled: false" in your cluster configuration. Learn more
2023-11-08 06:08:21 [ ] note: using Kubernetes version 1.32
2023-11-08 06:08:21 [ ] note: using provider "AWS" in "us-east-1" region with managed names
2023-11-08 06:08:21 [ ] note: 1 nodegroup (mg-1-workers) was included (based on the include/exclude rules)
2023-11-08 06:08:21 [ ] note: creating CloudFormation stack for cluster itself
2023-11-08 06:08:21 [ ] note: waiting for CloudFormation stack to become ready or try 'eksctl wait ready' (stacks)
2023-11-08 06:08:21 [ ] note: Kubernetes API endpoint access will use default of [publicAccess=true, privateAccess=false] for cluster "eks-cluster-03" in "us-east-1"
2023-11-08 06:08:21 [ ] note: you can enable it with 'eksctl update cluster --logging --enable-type=[SPECIFIC-VPC-LOG-TYPES-HERE (e.g. all)] --region=us-east-1 --cluster=eks-cluster-03'
2023-11-08 06:08:21 [ ] note: overall add-ons: metrics-server, vpc-cni, kube-proxy, coredns are not specified, will install them as EKS add-ons
2023-11-08 06:08:21 [ ] note: creating cluster control plane "eks-cluster-03"
2023-11-08 06:08:21 [ ] note: 5 sequential sub-tasks:
2023-11-08 06:08:21 [ ] note:   1 task: [ ] create add-on .
2023-11-08 06:08:21 [ ] note:   2 task: [ ] wait for control plane to become ready,
2023-11-08 06:08:21 [ ] note:   3 task: [ ] wait for ECR provider
2023-11-08 06:08:21 [ ] note:   4 task: [ ] no tasks
2023-11-08 06:08:21 [ ] note:   5 task: [ ] update ECR CM to use IAM if required,
2023-11-08 06:08:21 [ ] note:     create managed nodegroup "mg-1-workers",
2023-11-08 06:08:21 [ ] note: 2 sequential sub-tasks:
2023-11-08 06:08:21 [ ] note:   1 task: [ ] building cluster stack "eksctl-us-east-cluster-03-cluster"
2023-11-08 06:08:21 [ ] note:   2 task: [ ] displaying stack "eksctl-us-east-cluster-03-cluster"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] creating add-on vpc-cni
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-us-east-cluster-03-cluster"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-us-east-cluster-03-cluster"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-us-east-cluster-03-cluster"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-us-east-cluster-03-cluster"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] recommended policies were found for "sysctl" add-on, but since GIDC is disabled on the cluster, eksctl cannot configure the requested permissions; the recommended way to provide IAM permissions for "sysctl" add-on is via pod identity associations; after add-on creation is completed, add a
2023-11-08 06:08:21 [ ] note: 1 task: [ ] creating add-on: vpc-cni
2023-11-08 06:08:21 [ ] note: 1 task: [ ] creating add-on: kube-proxy
2023-11-08 06:08:21 [ ] note: 1 task: [ ] successfully created add-on: kube-proxy
2023-11-08 06:08:21 [ ] note: 1 task: [ ] successfully created add-on: coredns
2023-11-08 06:08:21 [ ] note: 1 task: [ ] creating add-on: vpc-cni
2023-11-08 06:08:21 [ ] note: 1 task: [ ] displaying stack "eksctl-us-east-cluster-03-addon-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-us-east-cluster-03-addon-vpc-cni"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] add-on "vpc-cni" active
2023-11-08 06:08:21 [ ] note: 1 task: [ ] building managed nodegroup stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for CloudFormation stack "eksctl-1-workers-03-nodegroup-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for the control plane to become ready
2023-11-08 06:08:21 [ ] note: 1 task: [ ] config as "%V:\users\meelp\kube\config"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] no tasks
2023-11-08 06:08:21 [ ] note: 1 task: [ ] All EKS cluster resources for "eks-cluster-03" have been created
2023-11-08 06:08:21 [ ] note: 1 task: [ ] 2 nodes(2) are now ready
2023-11-08 06:08:21 [ ] note: 1 task: [ ] node "ip-192-168-119-199.ec2.internal" is ready
2023-11-08 06:08:21 [ ] note: 1 task: [ ] node "ip-192-168-119-198.ec2.internal" is ready
2023-11-08 06:08:21 [ ] note: 1 task: [ ] waiting for at least 1 node(s) to become ready in "mg-1-workers"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] node "ip-192-168-119-199.ec2.internal" is ready
2023-11-08 06:08:21 [ ] note: 1 task: [ ] node "ip-192-168-119-198.ec2.internal" is ready
2023-11-08 06:08:21 [ ] note: 1 task: [ ] created 1 managed nodegroup(s) for cluster "eks-cluster-03"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] created 1 managed nodegroup(s) for cluster "eks-cluster-03"
2023-11-08 06:08:21 [ ] note: 1 task: [ ] successfully created add-on: metrics-server
2023-11-08 06:08:21 [ ] note: 1 task: [ ] eksctl command should work with "%V:\users\meelp\kube\config", try 'eksctl get nodes'
2023-11-08 06:08:21 [ ] note: 1 task: [ ] no tasks
PS C:\Users\meelp>
```

- This screenshot shows the successful creation of the Amazon EKS cluster named **eks-cluster-03** in the **us-east-1** region using **eksctl**.
- It displays the cluster initialization, creation of networking components, and installation of the core EKS add-ons (vpc-cni, kube-proxy, and coredns).
- The control plane and node group were both created successfully, indicating a fully functional EKS environment.

kubectl get nodes output showing worker nodes



The screenshot shows four separate Windows PowerShell windows side-by-side. Each window displays command-line output related to an EKS cluster named 'eks-cluster-03'. The first window shows the creation of the cluster with 'eksctl'. The second window shows the creation of a node group with 'eksctl'. The third window shows the listing of nodes with 'kubectl get nodes', which lists two EC2 instances: 'ip-192-168-119-199.ec2.internal' and 'ip-192-168-251-141.ec2.internal', both in 'Ready' state. The fourth window shows the configuration contexts with 'kubectl config get-contexts', listing the current context as 'eks-cluster-03.us-east-1.eksctl.io'.

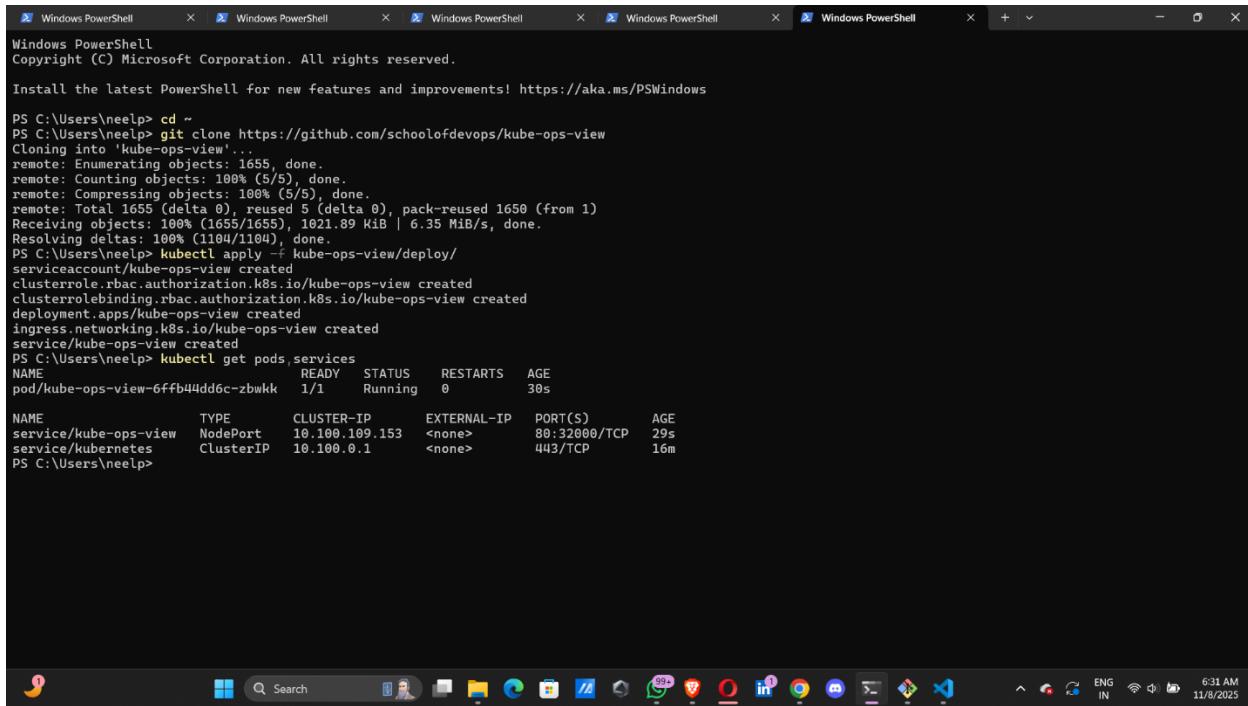
```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\neelp> eksctl get cluster
NAME          REGION      EKSCTL CREATED
eks-cluster-01 us-east-1  True
eks-cluster-02 us-east-1  True
eks-cluster-03 us-east-1  True
eks-cluster-again-01 us-east-1  True
PS C:\Users\neelp> eksctl get nodegroup --cluster eks-cluster-03
CLUSTER      NODEGROUP    STATUS   CREATED           MIN SIZE    MAX SIZE   DESIRED CAPACITY   INSTANCE TYPE   IMAGE ID          A
SG NAME          TYPE
eks-cluster-03 ng-1-workers ACTIVE  2025-11-08T00:56:50Z   1          4            2           t3.small       AL2023_x86_64_STANDA
RD  eks-nginx-ingress-96cd3078-e2f7-11a4-cc49-8fff235edcf3 managed
PS C:\Users\neelp> kubectl get nodes
NAME          STATUS   ROLES   AGE     VERSION
ip-192-168-119-199.ec2.internal   Ready   <none>  2m58s  v1.32.9-eks-113cf36
ip-192-168-251-141.ec2.internal   Ready   <none>  2m59s  v1.32.9-eks-113cf36
PS C:\Users\neelp> kubectl config get-contexts
CURRENT   NAME          CLUSTER          AUTHINFO
NAME          NAMESPACE
arn:aws:eks:us-east-1:065502538616:cluster/eks-cluster-01  arn:aws:eks:us-east-1:065502538616:cluster/eks-cluster-01  arn:aws:eks:us-east-1:0655
02538616:cluster/eks-cluster-01
arn:aws:eks:us-east-1:065502538616:cluster/eks-cluster-02  arn:aws:eks:us-east-1:065502538616:cluster/eks-cluster-02  arn:aws:eks:us-east-1:0655
02538616:cluster/eks-cluster-02
*   eks-admin@eks-cluster-03.us-east-1.eksctl.io          eks-cluster-03.us-east-1.eksctl.io                  eks-admin@eks-cluster-03.us-east-1.eksctl.io
PS C:\Users\neelp> |
```

- This screenshot confirms that the EKS cluster's **worker nodes** have been successfully launched and registered with the cluster.
- The two nodes (EC2 instances) are in the **Ready** state, showing that the Kubernetes worker nodes are healthy and connected to the control plane.
- The instance type used is **t3.small**, with Kubernetes version **v1.32.9**.

kubectl get pods,services after deploying kube-ops-view visualizer



The screenshot shows a Windows desktop environment with five PowerShell windows open in a horizontal strip. The PowerShell interface is dark-themed. The windows contain the following text:

```
Windows PowerShell
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PS C:\Users\neelp> cd ~
PS C:\Users\neelp> git clone https://github.com/schoolofdevops/kube-ops-view
Cloning into 'kube-ops-view'...
remote: Enumerating objects: 1655, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (5/5), done.
remote: Total 1655 (delta 0), reused 5 (delta 0), pack-reused 1650 (from 1)
Receiving objects: 100% (1655/1655), 1021.89 KiB | 6.35 MiB/s, done.
Resolving deltas: 100% (1104/1104), done.
PS C:\Users\neelp> kubectl apply -f kube-ops-view/deploy/
serviceaccount/kube-ops-view created
clusterrole.rbac.authorization.k8s.io/kube-ops-view created
clusterrolebinding.rbac.authorization.k8s.io/kube-ops-view created
deployment.apps/kube-ops-view created
ingress.networking.k8s.io/kube-ops-view created
service/kube-ops-view created
PS C:\Users\neelp> kubectl get pods,services
NAME                                READY   STATUS    RESTARTS   AGE
pod/kube-ops-view-6ffb44dd6c-zbwkk  1/1     Running   0          30s

NAME              TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
service/kube-ops-view  NodePort  10.100.109.153 <none>        80:32000/TCP  29s
service/kubernetes  ClusterIP  10.100.0.1    <none>        443/TCP    16m
PS C:\Users\neelp>
```

The taskbar at the bottom of the screen displays various application icons, including File Explorer, Edge, and other system icons. The system tray shows the date and time as 11/8/2025, 6:31 AM.

- This screenshot shows the successful deployment of the **Kube-Ops-View** visualization tool inside the EKS cluster.
- The pod `kube-ops-view` is in the **Running** state, and a **NodePort service (port 32000)** is exposed, allowing access to the Kubernetes cluster visualizer via a browser using the node's external IP.
- This verifies that the cluster can deploy and expose Kubernetes applications correctly.

The screenshot shows the AWS EC2 Instances page. A green success message at the top states: "Security groups for eni-0e37f9e1c09cf1a28 changed successfully". Below this, the "Instances (1/2) Info" section displays two instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Put
eks-cluster-03...	i-051f6d2dc4c7b63c1	Running	t3.small	3/3 checks passed	View alarms +	us-east-1a	ec2
eks-cluster-03...	i-03f33bef4969aced2	Running	t3.small	3/3 checks passed	View alarms +	us-east-1c	ec2

The instance details for "eks-cluster-03-0" are shown in the "Details" tab. Key information includes:

- Instance ID: i-051f6d2dc4c7b63c1
- Public IPv4 address: 35.170.53.250
- Private IPv4 addresses: 192.168.119.199, 192.168.124.219
- Public DNS: ec2-35-170-53-250.compute-1.amazonaws.com
- Instance state: Running

The browser taskbar at the bottom shows various open tabs and system icons.

The screenshot shows a web browser displaying logs from a metrics-server pod. The URL is https://10.100.0.1:443. The logs show the following output:

```
metrics-server-8ddff1d9b6-5td9w
Metrics Server Metrics Server
Status : Running [7/7 ready]
Start Time: 2025-11-08T00:53:26Z
Last Start: 2025-11-08T00:53:26Z
  app.kubernetes.io/instance: metrics-server
  app.kubernetes.io/name: metrics-server
Container: metrics-server
  metrics-server: running
CPU:
    Requested: 100 m
    Limit: 8 m
    Used: 2 m
Memory:
    Requested: 286 MiB
    Limit: 286 MiB
    Used: 19 MiB
```

The browser taskbar at the bottom shows various open tabs and system icons.