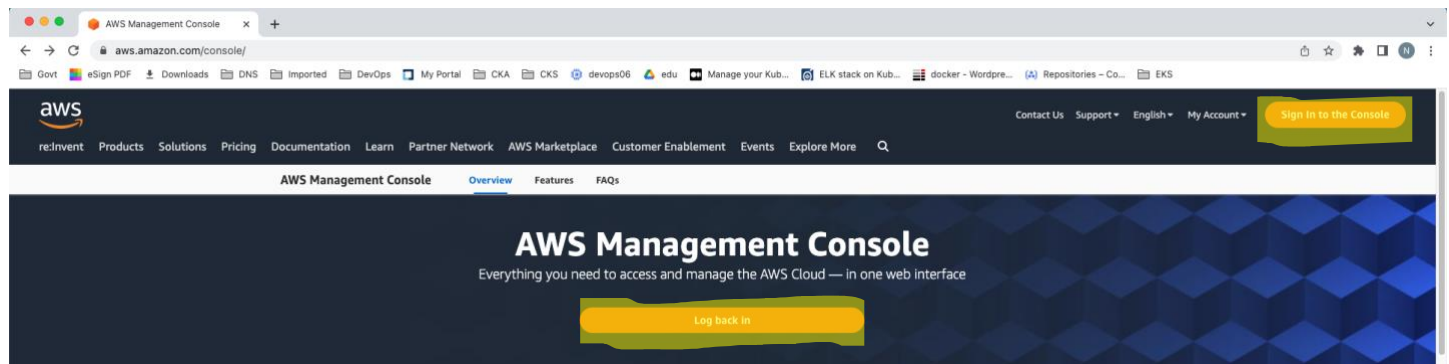
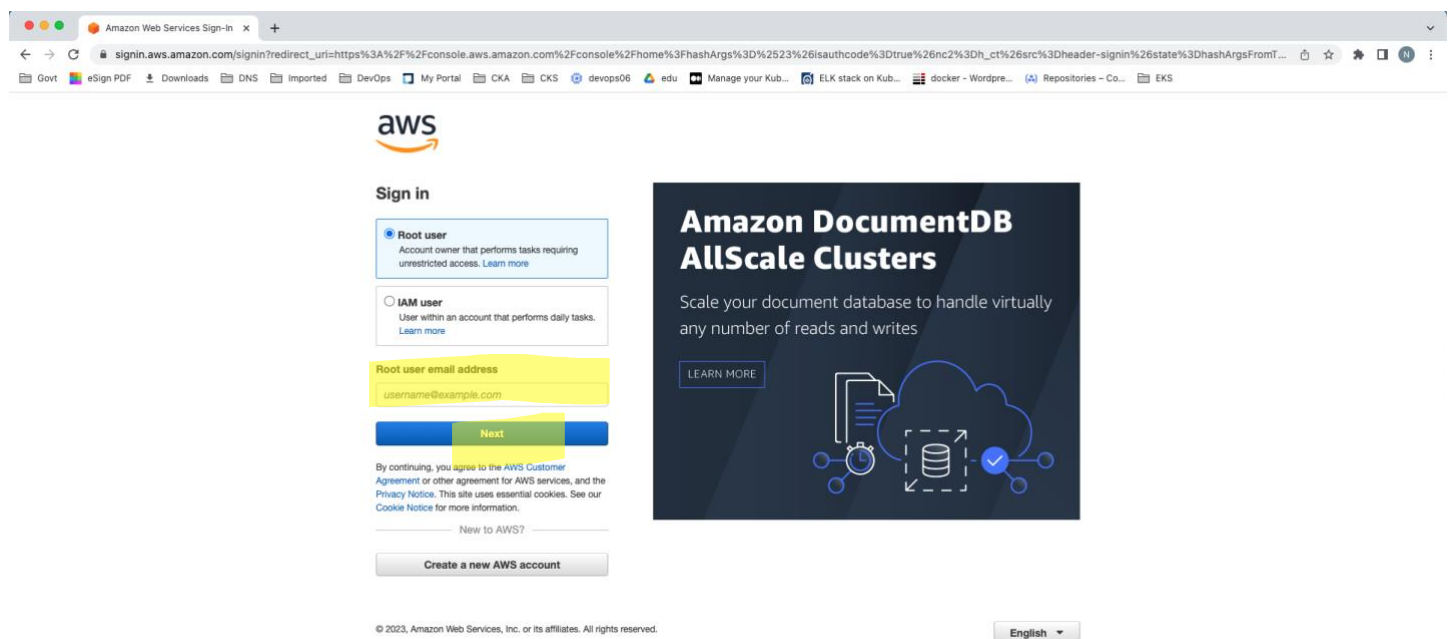


EKS Cluster Setup from Amazon Web Services (AWS) Console

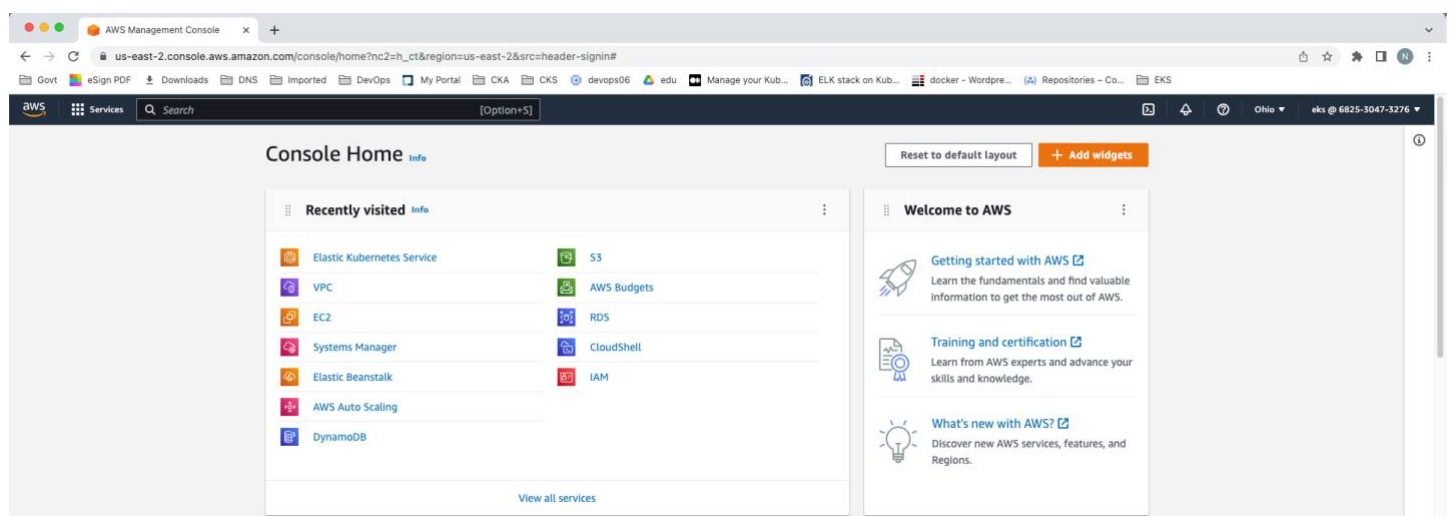
Open: <https://aws.amazon.com/console/>



Click on Sign into the Console & Login with “Root user” or “IAM User”



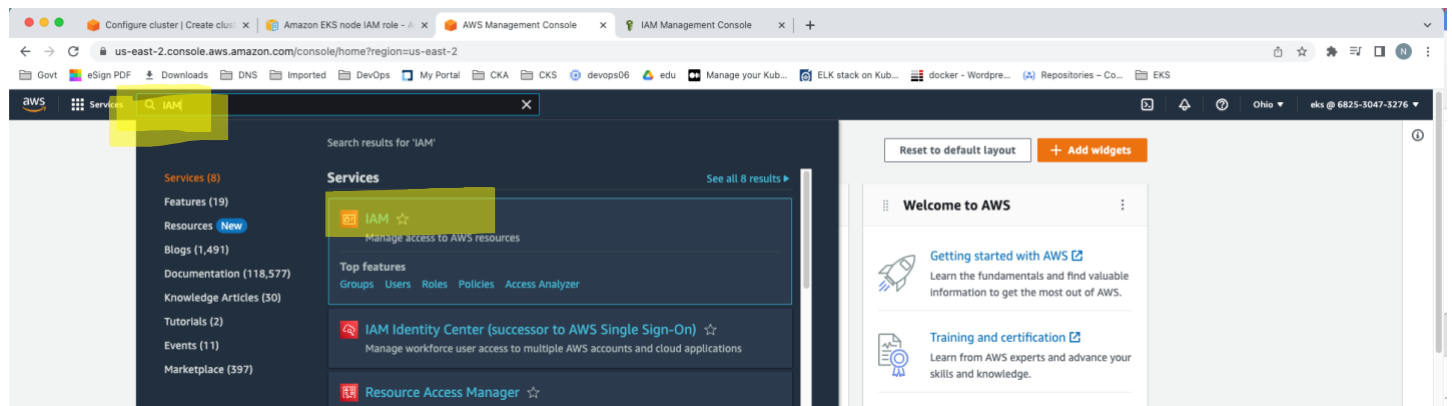
The default screen after login as below



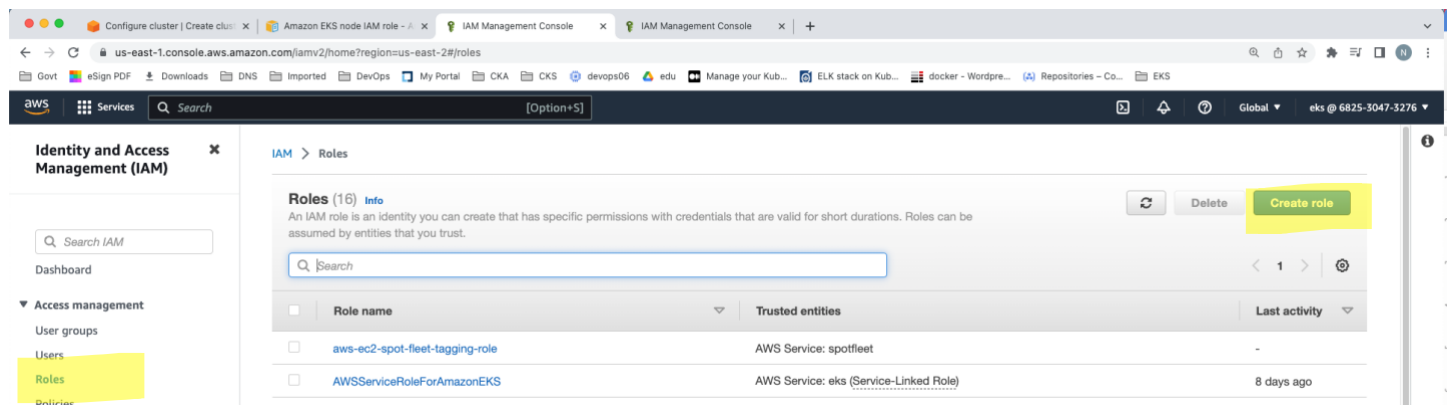
Before we create EKS Cluster we need to

- Create a IAM role with below for cluster(master) management
 - **AmazonEKSClusterPolicy**

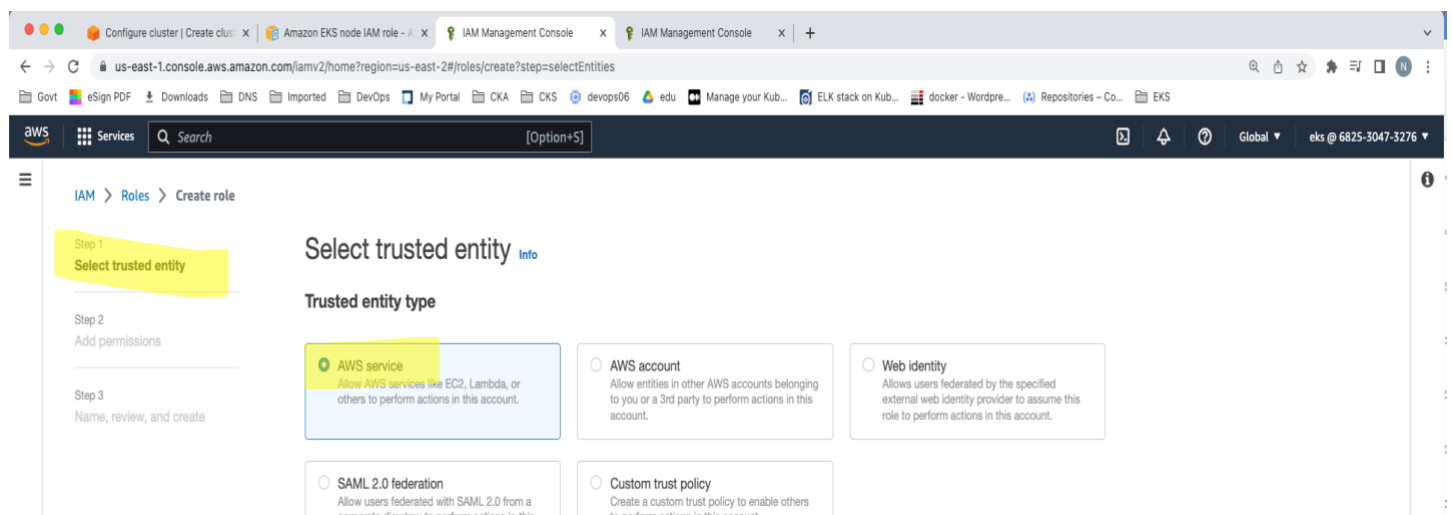
Search for IAM & Click on IAM from search results



Select Roles on IAM from left menu



Create role & select the options as below



Use Case

Select EKS from drop down
EKS – Cluster
then Click on Next button

The screenshot shows the 'Add permissions' step in the AWS IAM console. The 'Use case' section is expanded, showing 'EKS' as the selected option. The 'EKS - Cluster' policy is highlighted. The 'Next' button is visible at the bottom right.

Use case
Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

Common use cases

- ☐ EC2
Allows EC2 instances to call AWS services on your behalf.
- ☐ Lambda
Allows Lambda functions to call AWS services on your behalf.

Use cases for other AWS services:

- ☐ EKS
Allows EKS to manage clusters on your behalf.
- ☒ **EKS - Cluster**
Allows access to other AWS service resources that are required to operate clusters managed by EKS.
- ☐ EKS - Nodegroup
Allows EKS to manage nodegroups on your behalf.
- ☐ EKS - Fargate pod
Allows access to other AWS service resources that are required to run Amazon EKS pods on AWS Fargate.
- ☐ EKS - Fargate profile
Allows EKS to run Fargate tasks.
- ☐ EKS - Connector
Allows access to other AWS service resources that are required to connect to external clusters.
- ☐ EKS Local - Outpost
Allows Amazon EKS Local to call AWS services on your behalf.

Next

Next Page leave the defaults

The screenshot shows the 'Set permissions boundary' step in the AWS IAM console. The 'AmazonEKSClusterPolicy' is selected as the permissions policy. The 'Set permissions boundary - optional' section is expanded, showing the default setting. The 'Next' button is visible at the bottom right.

Add permissions

Permissions policies (1)

The type of role that you selected requires the following policy.

Policy name	Type	Attached entities
AmazonEKSClusterPolicy	AWS managed	4

Set permissions boundary - optional

Set a permissions boundary to control the maximum permissions this role can have. This is not a common setting, but you can use it to delegate permission management to others.

Next

ENTER THE ROLE NAME & CREATE THE ROLE

The screenshot shows the 'Name, review, and create' step in the AWS IAM console. The 'Role name' field is filled with 'EKS-MASTER-CLUSTER-ROLE'. The 'Description' field is filled with 'Allows access to other AWS service resources that are required to operate clusters managed by EKS.' The 'Create' button is visible at the bottom right.

Name, review, and create

Role details

Role name
Enter a meaningful name to identify this role.
EKS-MASTER-CLUSTER-ROLE
Maximum 64 characters. Use alphanumeric and '+', '=', '@', '-' characters.

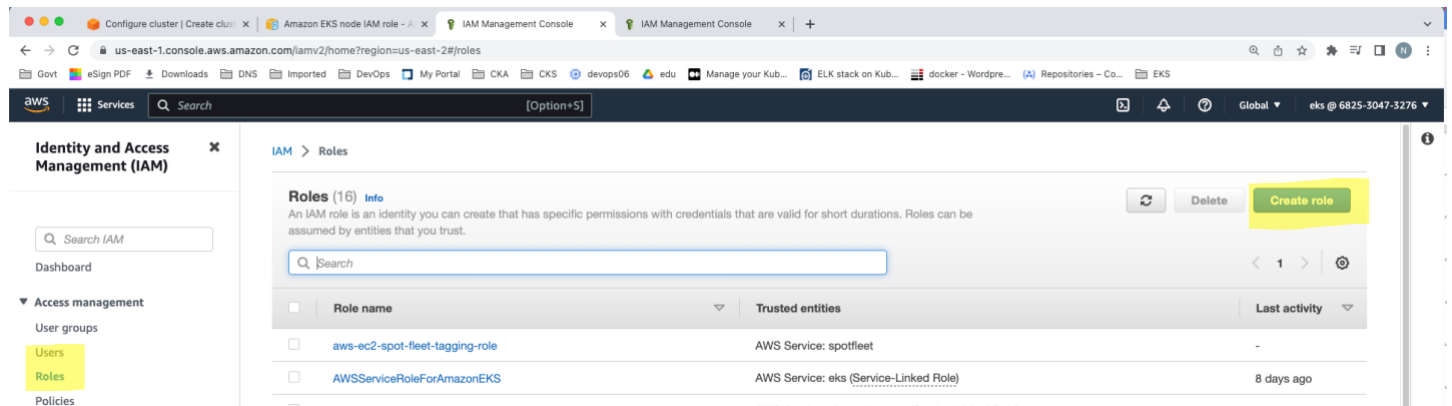
Description
Add a short explanation for this role.
Allows access to other AWS service resources that are required to operate clusters managed by EKS.
Maximum 1000 characters. Use alphanumeric and '+', '=', '@', '-' characters.

Create

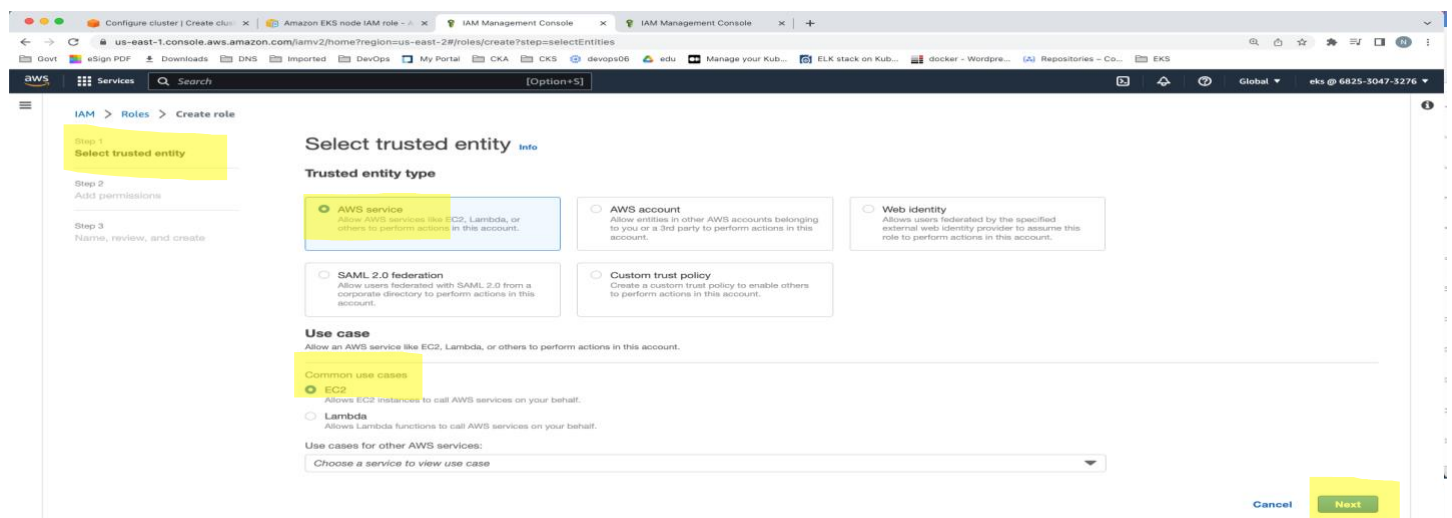
■ Create a IAM role with below for worker node management

- **AmazonEKSWorkerNodePolicy**
- **AmazonEKS_CNI_Policy**
- **AmazonEC2ContainerRegistryReadOnly**

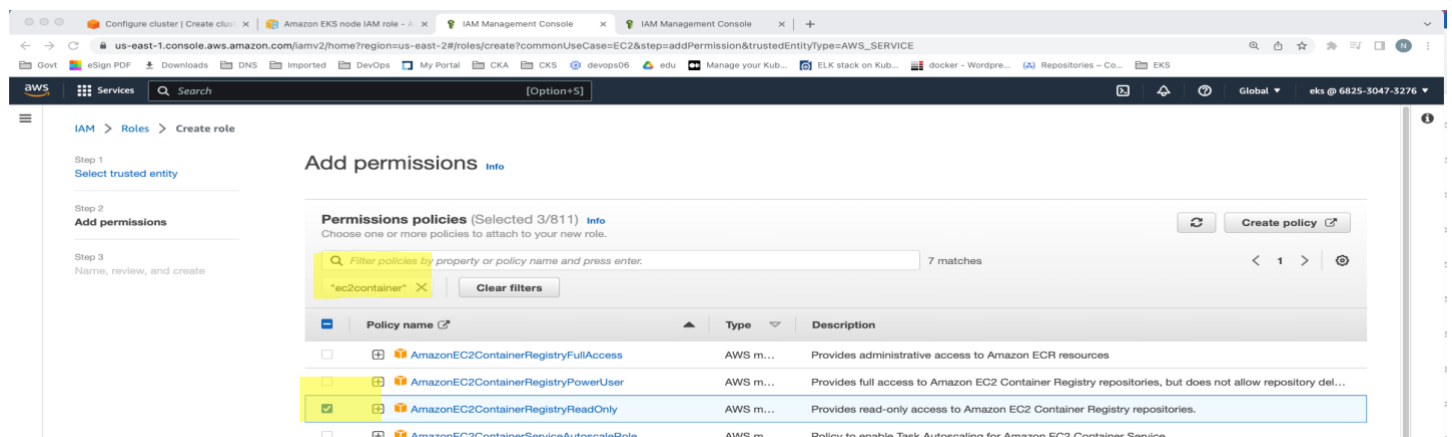
Select Roles on left menu from IAM Page

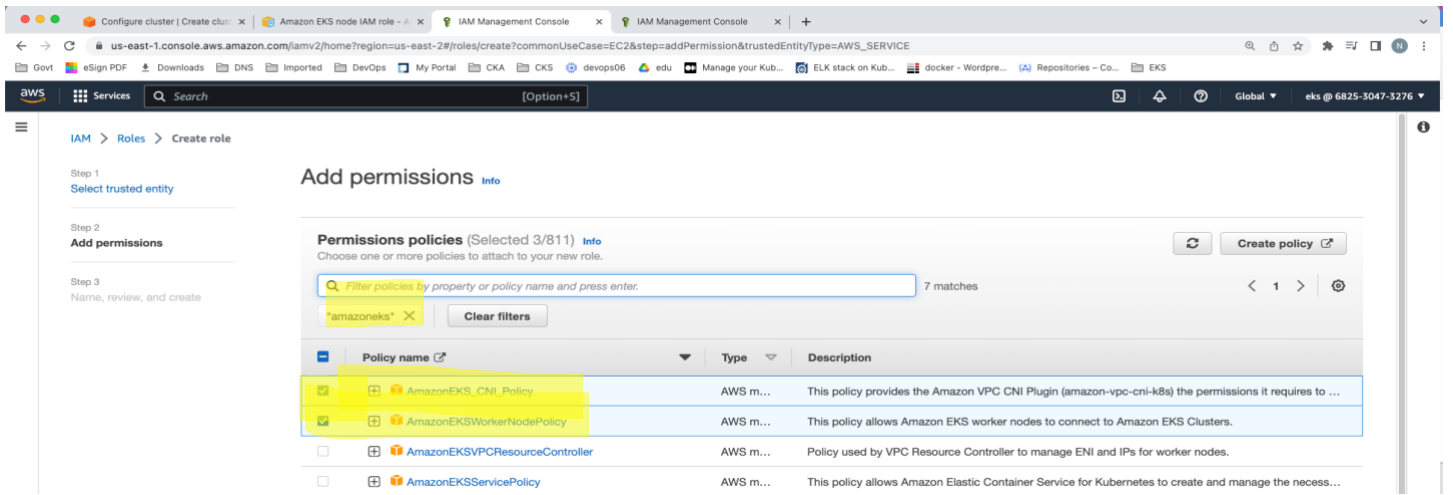


Click on Create role & select the options as below & Click on Next

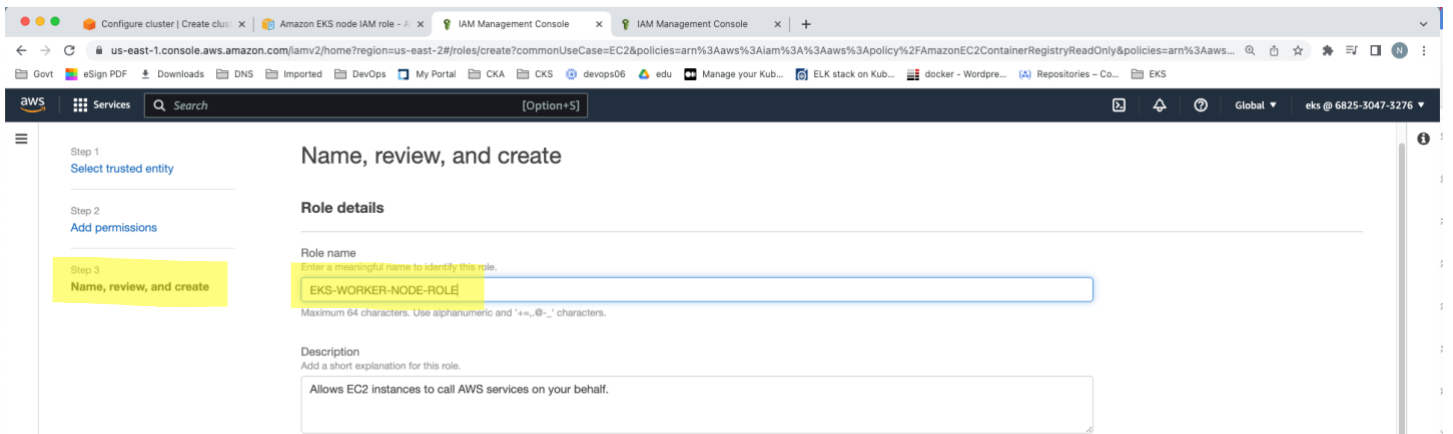


Add Permissions as Below & Click on Next button

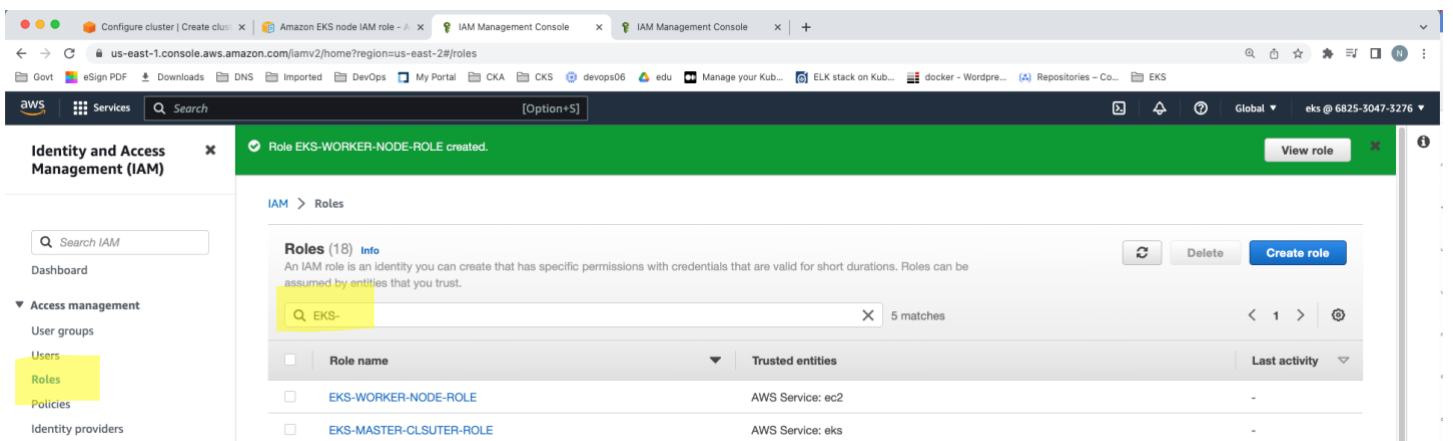




Enter a Role Name & Click on Create role

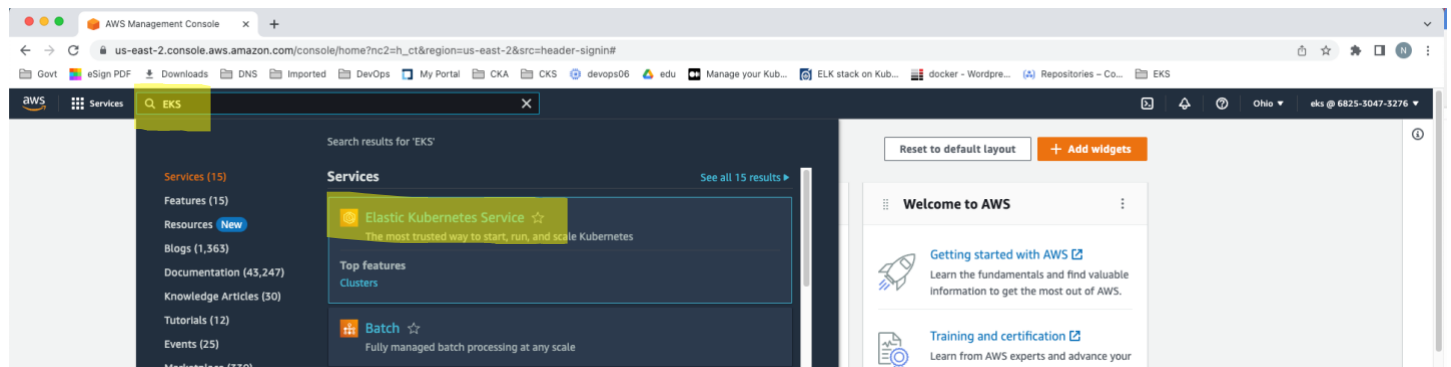


Ensure both roles are available as below

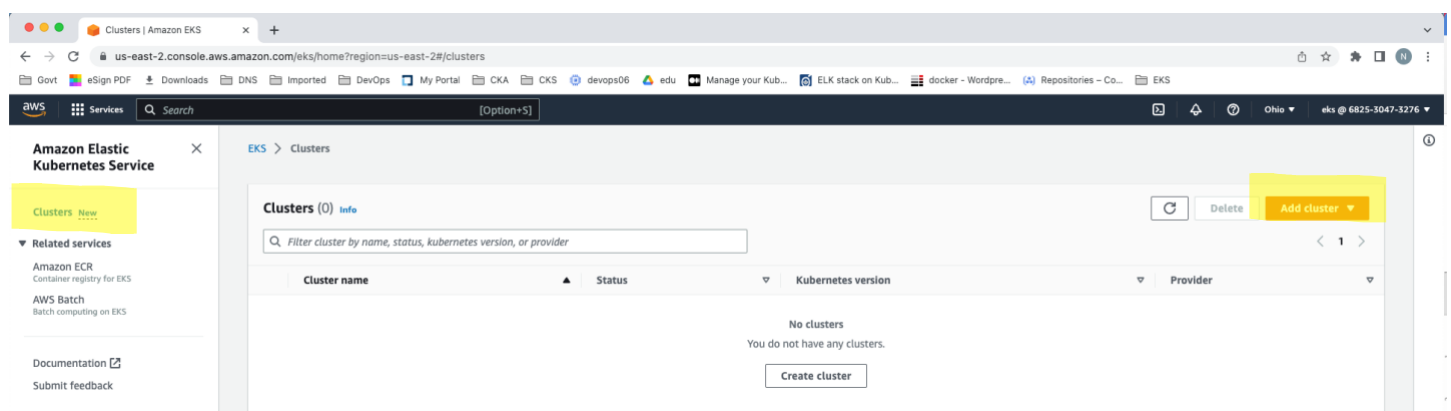


Now Let's Start Creating EKS Cluster

In the search box type “EKS” and select Elastic Kubernetes Service from the search results



On next page select “Clusters” on the left menu & Click on **Add Cluster** drop down & create



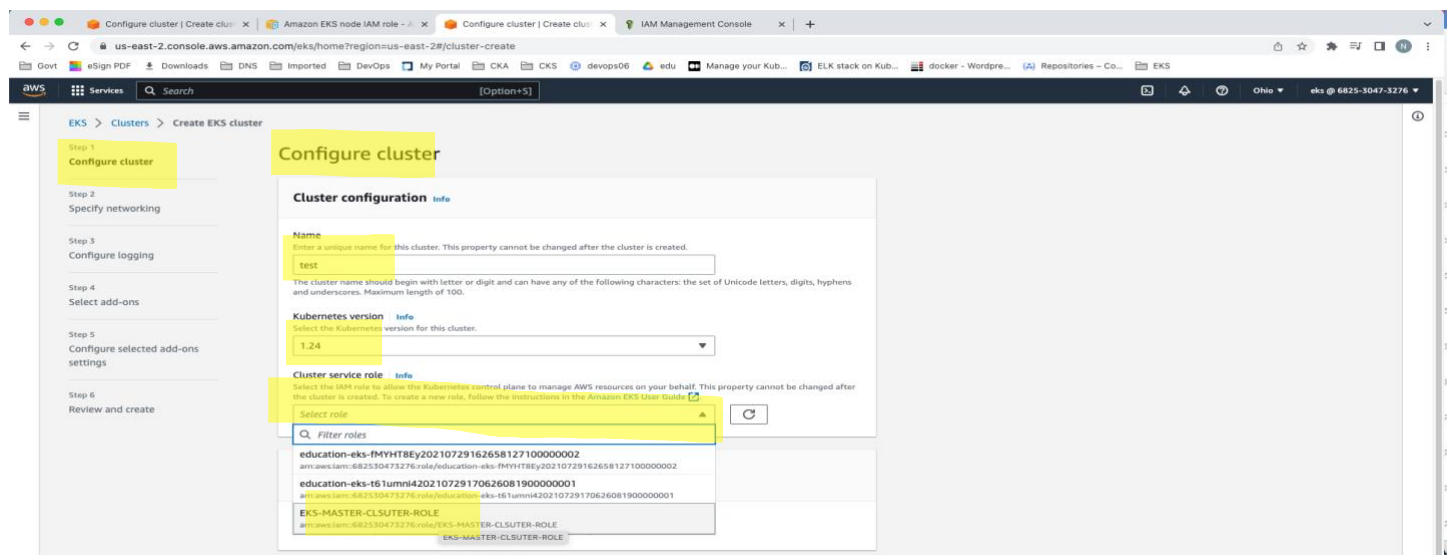
On the next page

Step1: Configure Cluster

Enter name

Choose Kubernetes version

Choose the cluster service role as below



Step2: networking – choose the options as below

Note: Ensure to Select a Security Group with necessary access

The screenshot shows the 'Specify networking' step in the AWS Management Console. The left sidebar lists steps 2 through 6, with 'Specify networking' highlighted. The main content area is titled 'Networking' and includes the following sections:

- VPC:** A dropdown menu shows 'vpc-073e5a6c | Default'.
- Subnets:** A dropdown menu shows 'Select subnets', and three subnets are listed: 'subnet-02c63c7f', 'subnet-2f840844', and 'subnet-d2a4869e'.
- Security groups:** A dropdown menu shows 'Select security groups'.
- Choose cluster IP address family:** Two radio buttons are present: 'IPv4' (selected) and 'IPv6'.
- Cluster endpoint access:** Three radio buttons are present: 'Public', 'Public and private' (selected), and 'Private'.

At the bottom right, there are three buttons: 'Cancel', 'Previous', and 'Next'.

Step3: Configure logging – leave the defaults as below

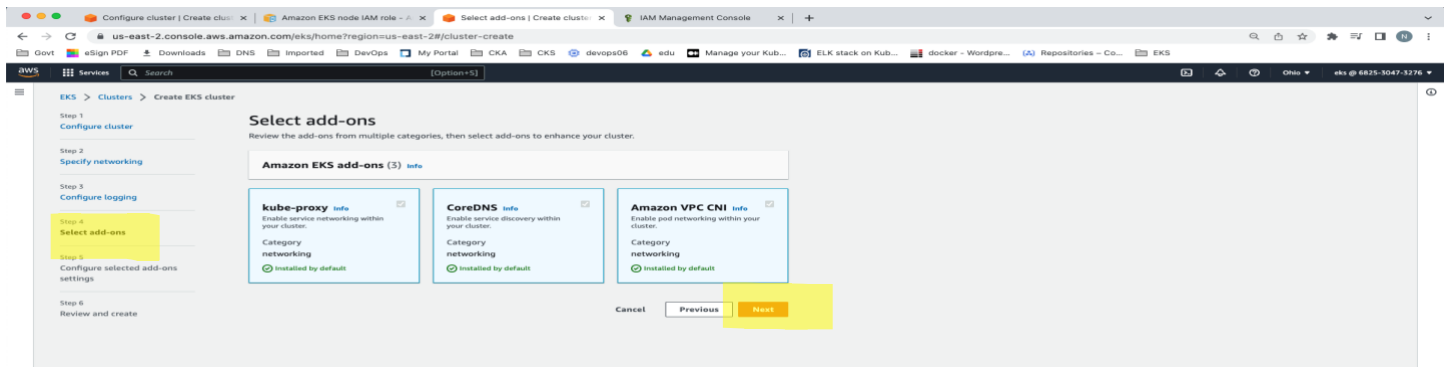
The screenshot shows the 'Configure logging' step in the AWS Management Console. The left sidebar lists steps 2 through 6, with 'Configure logging' highlighted. The main content area is titled 'Configure logging' and includes the following sections:

- Control plane logging:** A section with the heading 'Send audit and diagnostic logs from the Amazon EKS control plane to CloudWatch Logs.' and five toggle switches:

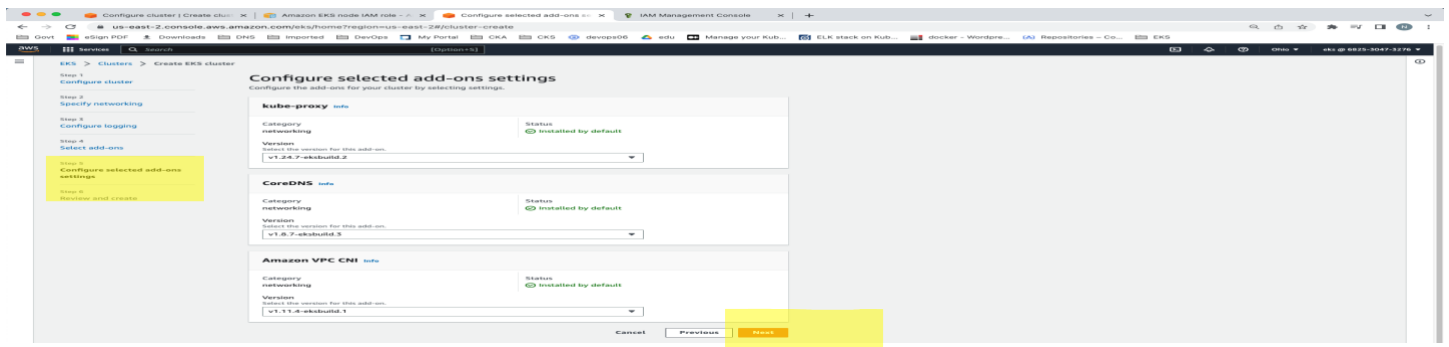
Logging Type	Description
<input checked="" type="checkbox"/> API server	Logs pertaining to API requests to the cluster.
<input checked="" type="checkbox"/> Audit	Logs pertaining to cluster access via the Kubernetes API.
<input checked="" type="checkbox"/> Authenticator	Logs pertaining to authentication requests into the cluster.
<input checked="" type="checkbox"/> Controller manager	Logs pertaining to state of cluster controllers.
<input checked="" type="checkbox"/> Scheduler	Logs pertaining to scheduling decisions.

At the bottom right, there are three buttons: 'Cancel', 'Previous', and 'Next'.

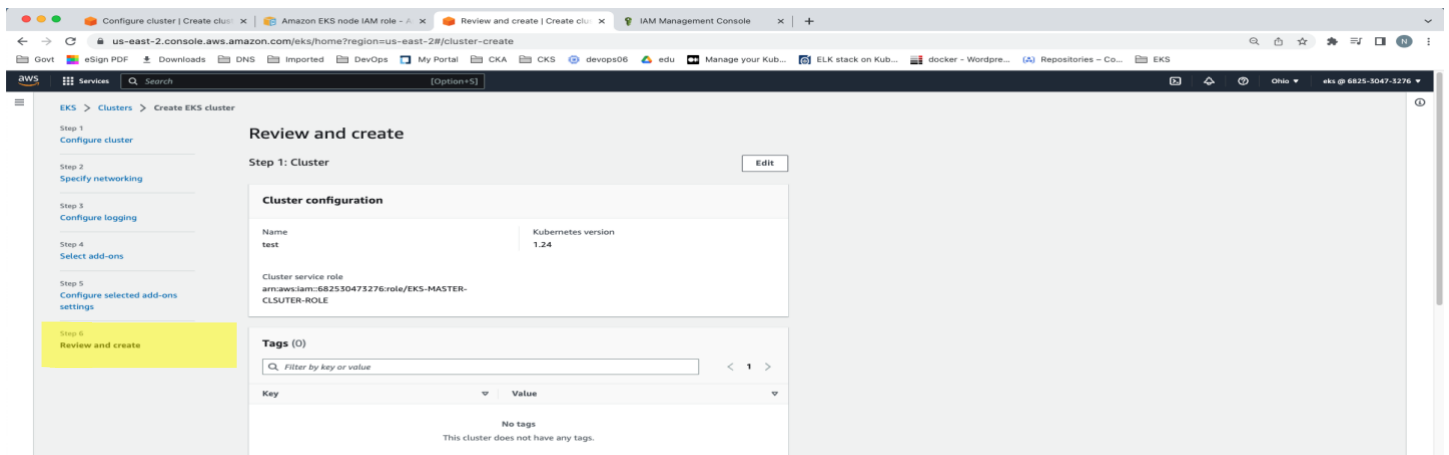
Step4: Select add-ons – leave the defaults as below



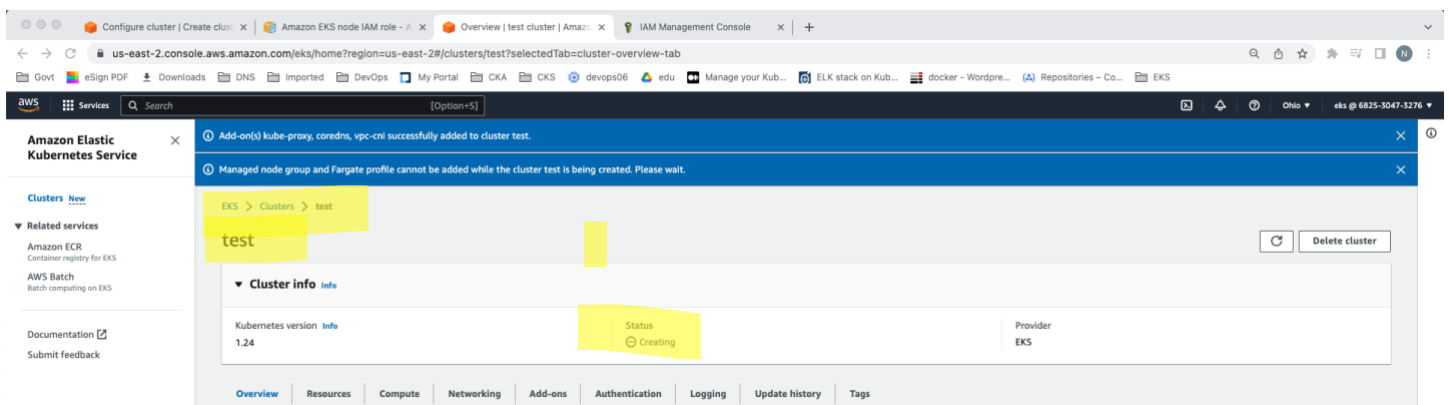
Step5: Configure selected add-ons settings – leave the defaults as below



Step6: review & Click on Create button

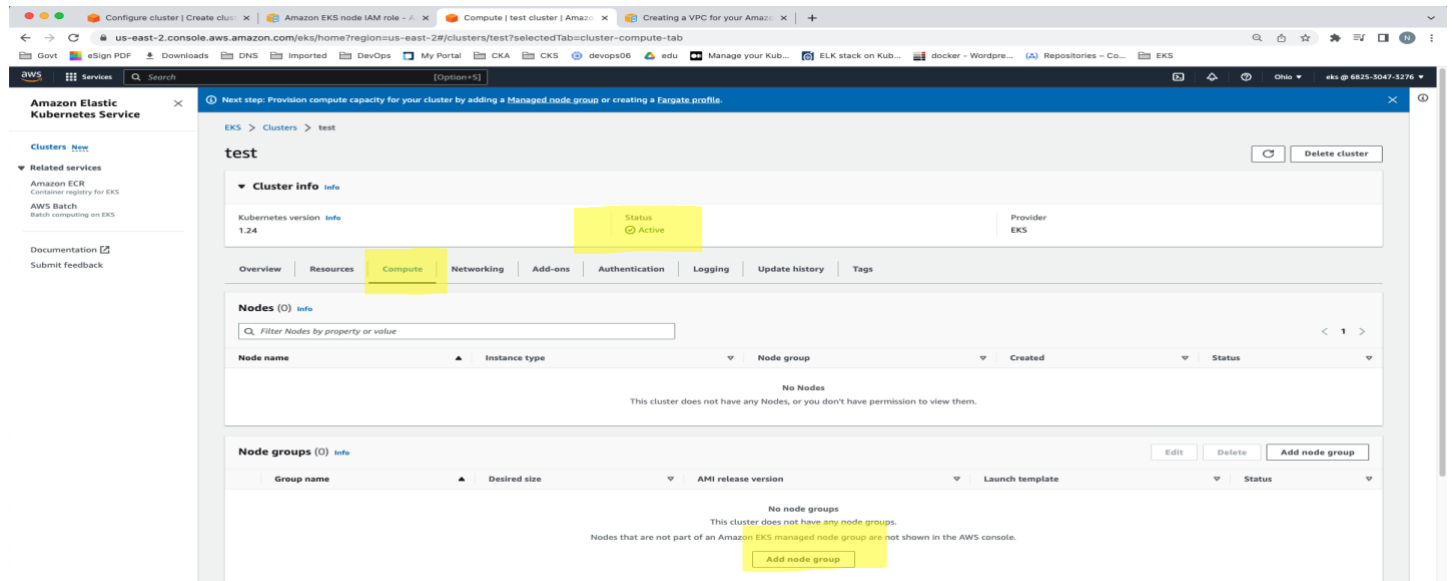


Cluster will take 10 – 15 min to create



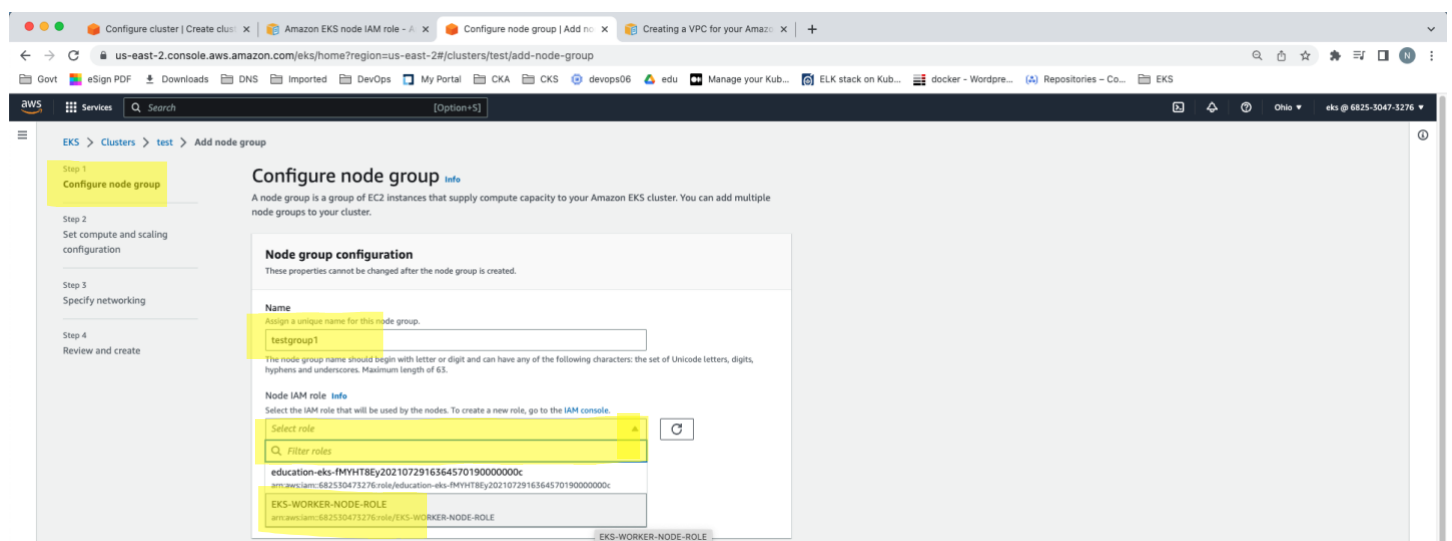
Now Add Worker Nodes to Master (called eks cluster managed by aws)

Once the cluster is “Active” we can add the Node Groups (worker nodes)



Click on “Add node group” & On Next Page

Step1: Configure node group, choose options as below click on next button



Step2: Set Compute and scaling configuration

The screenshot shows the 'Set compute and scaling configuration' page in the AWS console. The page is divided into three main sections: Node group compute configuration, Node group scaling configuration, and Node group update configuration.

Node group compute configuration

- AMI type:** Select the EKS-optimized Amazon Machine Image for nodes. The dropdown shows 'Amazon Linux 2 (AL2_x86_64)'.
- Capacity type:** Select the capacity purchase option for this node group. The dropdown shows 'On-Demand'.
- Instance types:** Select instance types you prefer for this node group. The dropdown shows 't3.medium'. A tooltip for 't3.medium' is visible, showing 'vCPU: 2 vCPUs, Memory: 4 GiB, Network Up to 5 Gbps, Max ENI: 3, Max IP: 18'.
- Disk size:** Select the size of the attached EBS volume for each node. The input field shows '15' GB.

Node group scaling configuration

- Desired size:** Set the desired number of nodes that the group should launch with initially. The input field shows '2' nodes.
- Minimum size:** Set the minimum number of nodes that the group can scale in to. The input field shows '2' nodes.
- Maximum size:** Set the maximum number of nodes that the group can scale out to. The input field shows '2' nodes.

Node group update configuration

- Maximum unavailable:** Set the maximum number or percentage of unavailable nodes to be tolerated during the node group version update. The 'Number' radio button is selected, and the input field shows '1' node.

At the bottom of the page, there are 'Cancel', 'Previous', and 'Next' buttons.

Step3: Specify Networking -- Ensure to Choose

SSH Key, so that we can login to EC2 Instances later
Configure the Security Groups for proper traffic routing

The screenshot shows the 'Specify networking' page in the AWS console. The page is divided into three main sections: Node group network configuration, SSH key pair, and Allow SSH remote access from.

Node group network configuration

- Subnets:** Specify the subnets in your VPC where your nodes will run. To create a new subnet, go to the corresponding page in the VPC console. The dropdown shows 'subnet-02c63c7f', 'subnet-2f840844', and 'subnet-d2a4869e'.

SSH key pair

- SSH key pair:** Select an SSH key pair or create a new SSH key pair. To create a new SSH key pair, go to the corresponding page in the EC2 console. The dropdown shows 'ed8d9116'.

Allow SSH remote access from

- Selected security groups:** Specify security groups to restrict which source IPs can remotely access nodes. The 'All' radio button is selected, and the input field shows 'sg-0099f713c9f90cd06'.

At the bottom of the page, there are 'Cancel', 'Previous', and 'Next' buttons.

Step4: Review & Click on Create Button

The screenshot shows the AWS Management Console interface for the 'Review and create' step of adding a node group to an EKS cluster. The breadcrumb navigation at the top indicates the path: EKS > Clusters > test > Add node group. On the left sidebar, a list of steps is shown: Step 1: Configure node group (active), Step 2: Set compute and scaling configuration, Step 3: Specify networking, and Step 4: Review and create (highlighted in yellow). The main content area is titled 'Review and create' and 'Step 1: Node group'. It contains two sections: 'Node group configuration' and 'Kubernetes labels (0)'. The 'Node group configuration' section shows the Name as 'testgroup1' and the Node IAM role as 'arn:aws:iam::682530473276:role/EKS-WORKER-NODE-ROLE'. The 'Kubernetes labels (0)' section shows a search bar and a table with columns 'Key' and 'Value', indicating that no labels are currently set.

Review and create

Step 1: Node group Edit

Node group configuration

Name	Node IAM role
testgroup1	arn:aws:iam::682530473276:role/EKS-WORKER-NODE-ROLE

Kubernetes labels (0)

Filter by key or value

Key	Value
No labels	
This node group does not have any Kubernetes labels.	

Note: The nodes will take another 10-15 min for complete setup

How to Connect to EKS Cluster ?

Ans: We need to install aws cli & kubectl cli tools on a machine

To setup the above tools we may use

- Use AWS Cloud Shell – here you will see both aws cli & kubectl already installed
- Create a EC2 VM & install
- install on your own laptops/desktops (windows or mac)

install AWS CLI:

<https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html>

install kubectl CLI:

<https://kubernetes.io/docs/tasks/tools/>

Connect to EKS Cluster using AWS Cloud Shell:

<https://github.com/lerndevops/eks/blob/main/01-setup/Connect-to-EKS-Cluster-Using-AWS-CloudShell.pdf>