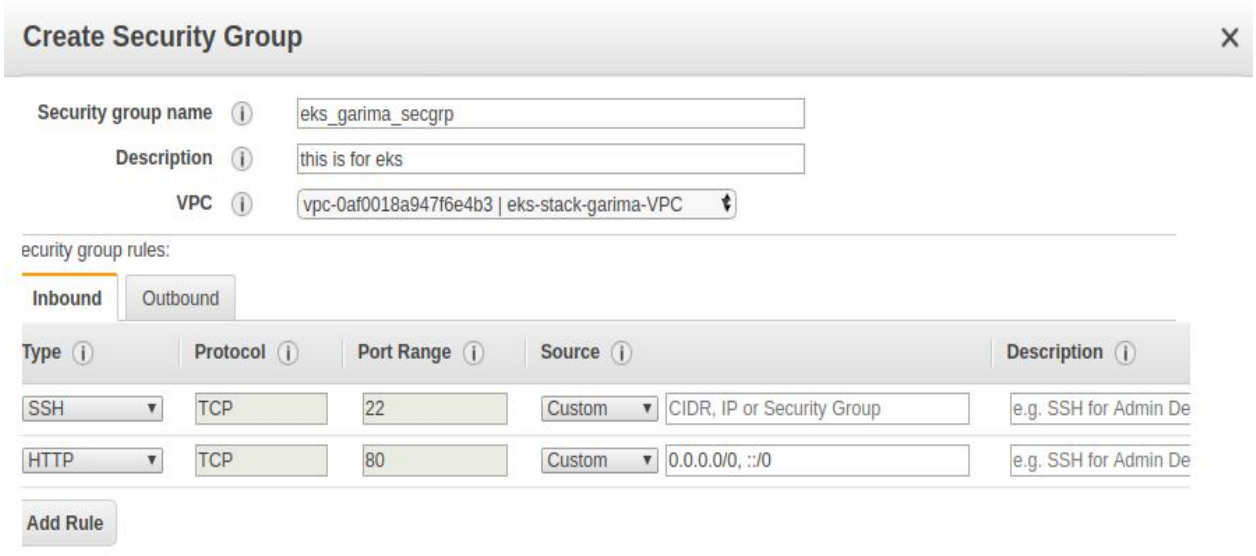
ASSESSMENT - 18

EKS - 1

1. Create eks cluster using eksctl
   During creation, Specify
   - Cluster name
   - Kubernetes version
   - Control plane role
   - Subnets for Control Plane
   - Control Plane security Group
   - Add tag: owner, purpose on Control Plane
   - Node Group Name
   - Node Instance Role
   - Subnets for Node Group
   - Node Instance SSH key pair
   - Node Instance Security Group
   - Node Instance Instance Type
   - Node Instance Disk
   - Add tag: owner, purpose on Node Group
   - Node Group Size: min, max



```
garima@garima:~$ eksctl version
[ℹ]  version.Info{BuiltAt:"", GitCommit:"", GitTag:"0.13.0"}
garima@garima:~$ vim garima.yaml
```

```yaml
apiVersion: eksctl.io/v1alpha5
kind: ClusterConfig
metadata:
  name: my-test
  region: us-east-1
vpc:
  id: "vpc-0af0018a947f6e4b3"
  cidr: "192.168.0.0/16"
  subnets:
    public:
      us-east-1c:
          id: "subnet-055976fde57060ff0"
          cidr: "192.168.192.0/18"
      us-east-1b:
          id: "subnet-0c0e750b3f41ba157"
          cidr: "192.168.128.0/18"
      us-east-1a:
          id: "subnet-0549ccd892830c1ab"
          cidr: "192.168.64.0/18"
iam:
  serviceRoleARN: "arn:aws:iam::044650439222:role/eks_role_garima"
```

```yaml
managedNodeGroups:
  - name: managed-ng-1
    instanceType: m5.large
    minSize: 2
    desiredCapacity: 3
    maxSize: 4
    availabilityZones: ["us-east-1a","us-east-1b","us-east-1c"]
    volumeSize: 20
    securityGroups:
      withShared: true
      withLocal: true
      attachIDs: ['sg-07347f027015cae61']
    ssh:
      allow: true
      publicKeyName: 'newawskeypair'
    tags:
      'owner': 'garima'
    iam:
      instanceProfileARN: "arn:aws:iam::044650439222:instance-profile/worker_node_garima"
```

```
garima@garima:~$ eksctl create cluster -f garima.yaml
Error: loading config file "garima.yaml": error unmarshaling JSON: while decoding JSON: json: unknown field "securityGroups"
garima@garima:~$ vim garima.yaml
garima@garima:~$ eksctl create cluster -f garima.yaml
[i]  eksctl version 0.13.0
[i]  using region us-east-1
=^[===++++[!]  retryable error (RequestError: send request failed
caused by: Post https://ec2.us-east-1.amazonaws.com/: net/http: TLS handshake timeout) from ec2/DescribeVpcs - will retry aft
078ms
[✔]  using existing VPC (vpc-0af0018a947f6e4b3) and subnets (private:[] public:[subnet-0549ccd892830c1ab subnet-0c0e750b3f41b
fde57060ff0])
[!]  custom VPC/subnets will be used; if resulting cluster doesn't function as expected, make sure to review the configuratio
[i]  nodegroup "managed-ng-1" will use "ami-087a82f6b78a07557" [AmazonLinux2/1.14]
[i]  using EC2 key pair "newawskeypair"
[i]  using Kubernetes version 1.14
[i]  creating EKS cluster "my-test" in "us-east-1" region with un-managed nodes
[i]  1 nodegroup (managed-ng-1) was included (based on the include/exclude rules)
[i]  will create a CloudFormation stack for cluster itself and 1 nodegroup stack(s)
[i]  will create a CloudFormation stack for cluster itself and 0 managed nodegroup stack(s)
[i]  if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=us-east-1 --clus
[i]  CloudWatch logging will not be enabled for cluster "my-test" in "us-east-1"
[i]  you can enable it with 'eksctl utils update-cluster-logging --region=us-east-1 --cluster=my-test'
[i]  Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "my-test" in "us
[i]  2 sequential tasks: { create cluster control plane "my-test", create nodegroup "managed-ng-1" }
[i]  building cluster stack "eksctl-my-test-cluster"
[i]  deploying stack "eksctl-my-test-cluster"
```

```
[!]  retryable error (RequestError: send request failed
caused by: Post https://cloudformation.us-east-1.amazonaws.com/: dial tcp:
er misbehaving) from cloudformation/DescribeStacks - will retry after dela
[!]  retryable error (RequestError: send request failed
caused by: Post https://cloudformation.us-east-1.amazonaws.com/: dial tcp:
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[!]  retryable error (RequestError: send request failed
caused by: Post https://cloudformation.us-east-1.amazonaws.com/: dial tcp:
er misbehaving) from cloudformation/DescribeStacks - will retry after dela
[!]  retryable error (RequestError: send request failed
caused by: Post https://cloudformation.us-east-1.amazonaws.com/: dial tcp:
er misbehaving) from cloudformation/DescribeStacks - will retry after dela
[!]  retryable error (RequestError: send request failed
caused by: Post https://ec2.us-east-1.amazonaws.com/: net/http: TLS handsha
549248ms
[i]  building nodegroup stack "eksctl-my-test-nodegroup-managed-ng-1"
[i]  deploying stack "eksctl-my-test-nodegroup-managed-ng-1"
[!]  retryable error (RequestError: send request failed
caused by: Post https://iam.amazonaws.com/: net/http: TLS handshake timeou
s
```
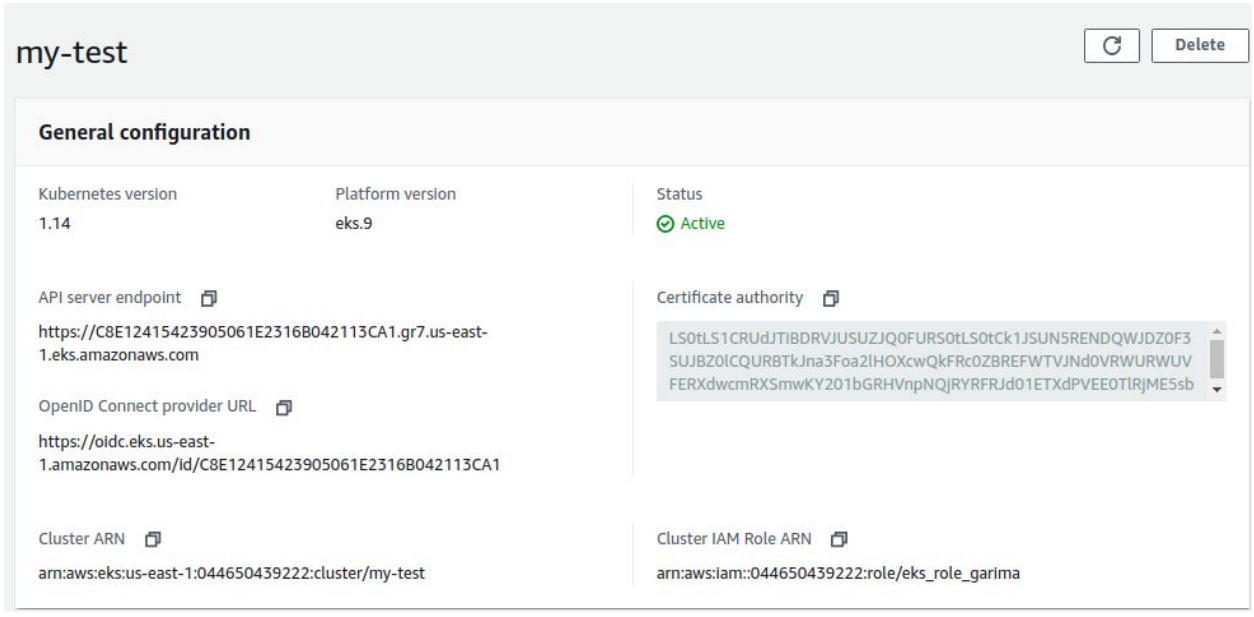

```
[i]  building nodegroup stack "eksctl-my-test-nodegroup-managed-ng-1"
[i]  deploying stack "eksctl-my-test-nodegroup-managed-ng-1"
[!]  retryable error (RequestError: send request failed
caused by: Post https://iam.amazonaws.com/: net/http: TLS handshake timeout) from iam/GetIns
s
[✔]  all EKS cluster resources for "my-test" have been created
[✔]  saved kubeconfig as "/home/garima/.kube/config"
[i]  adding identity "arn:aws:iam::044650439222:role/worker_node_garima" to auth ConfigMap
[i]  nodegroup "managed-ng-1" has 1 node(s)
[i]  node "ip-192-168-123-23.ec2.internal" is not ready
[i]  waiting for at least 2 node(s) to become ready in "managed-ng-1"
[i]  nodegroup "managed-ng-1" has 3 node(s)
[i]  node "ip-192-168-123-23.ec2.internal" is ready
[i]  node "ip-192-168-143-62.ec2.internal" is not ready
[i]  node "ip-192-168-240-135.ec2.internal" is ready
[i]  kubectl command should work with "/home/garima/.kube/config", try 'kubectl get nodes'
[✔]  EKS cluster "my-test" in "us-east-1" region is ready
```



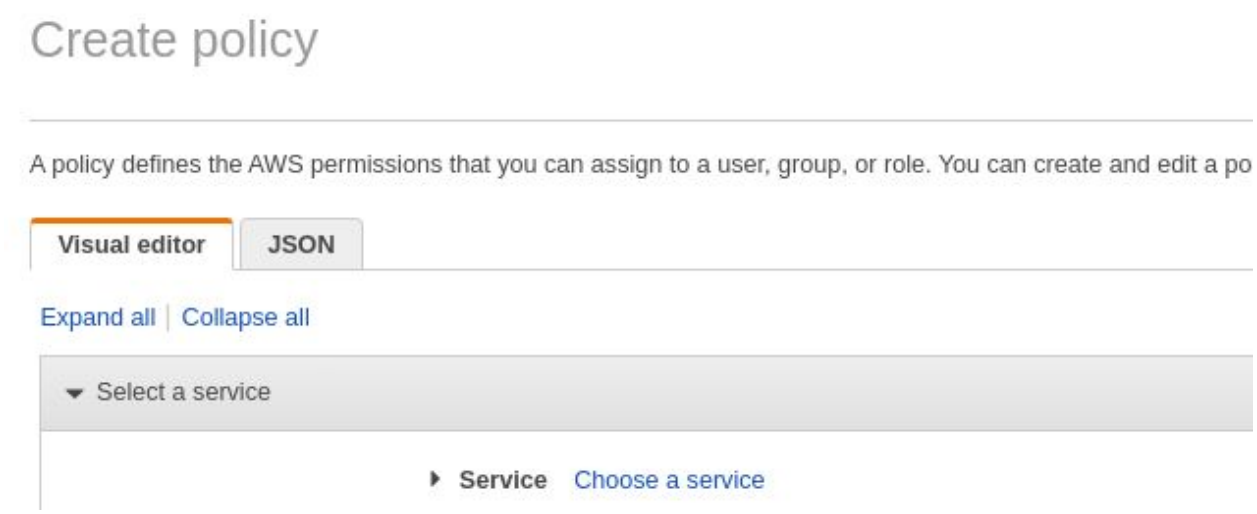

```
garima@garima:~$ eksctl get cluster
NAME            REGION
garima_cluster  us-east-1
my-test         us-east-1
garima@garima:~$ kubectl get nodes
NAME                                STATUS   ROLES    AGE   VERSION
ip-192-168-123-23.ec2.internal      Ready    <none>   28m   v1.14.8-eks-b8860f
ip-192-168-143-62.ec2.internal      Ready    <none>   28m   v1.14.8-eks-b8860f
ip-192-168-240-135.ec2.internal     Ready    <none>   28m   v1.14.8-eks-b8860f
garima@garima:~$
```

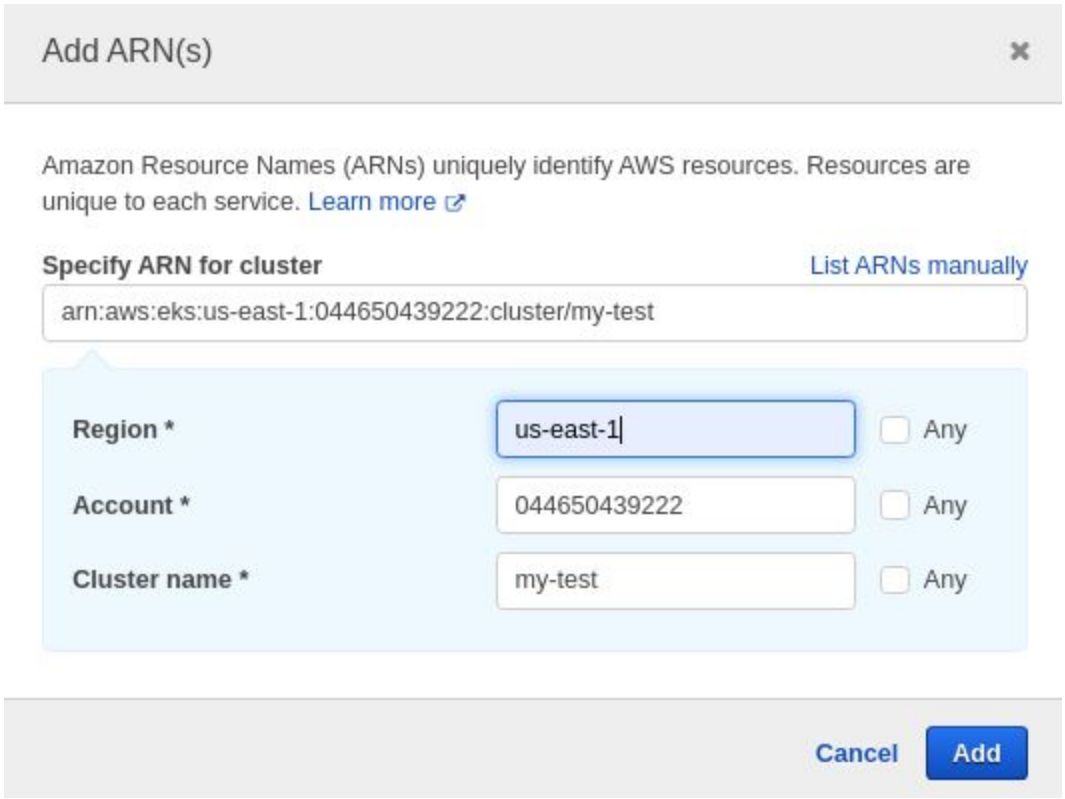
2. **Authentication Management**
    a. **Add new 2 IAM user into the cluster**

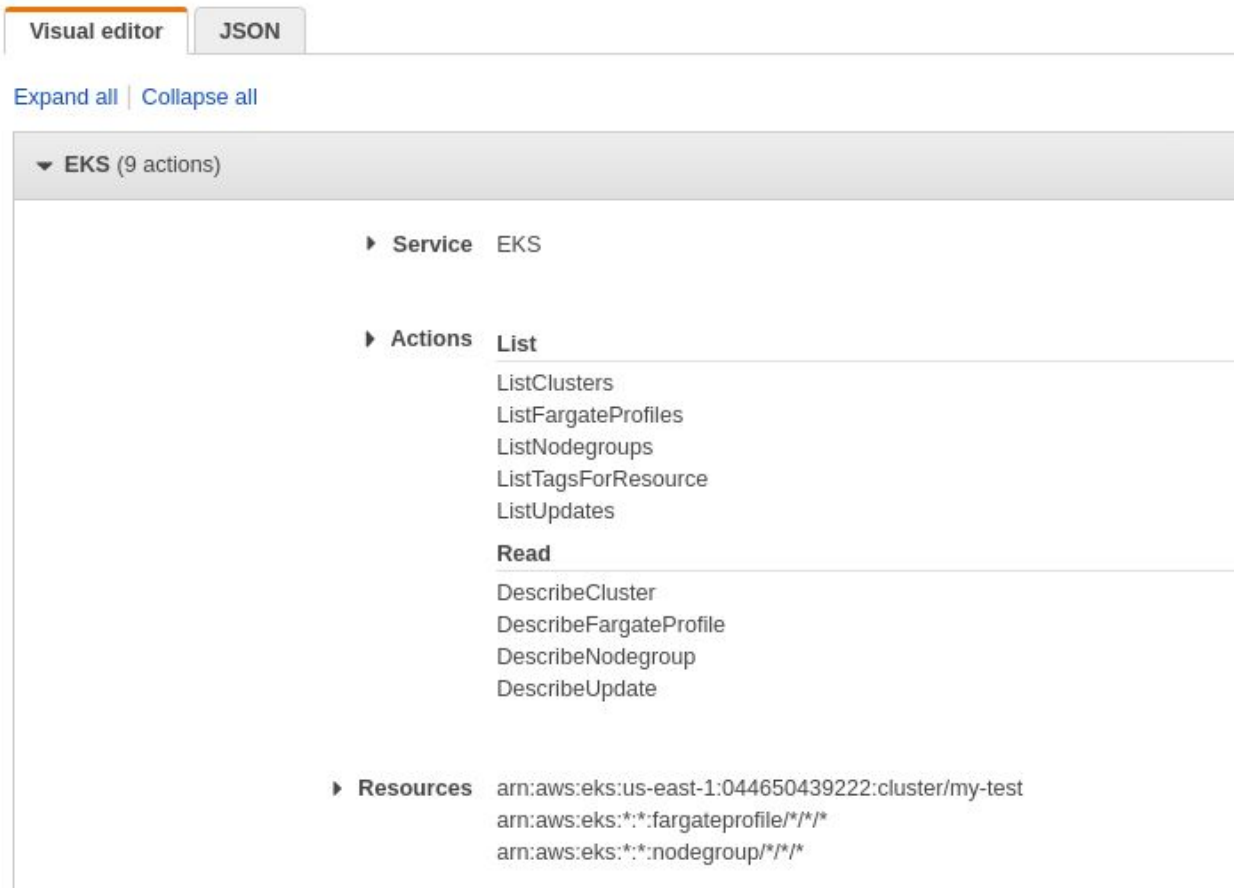
```
garima@garima:~$
garima@garima:~$ kubectl edit -n kube-system configmap/aws-auth
```

```
apiVersion: v1
data:
  mapRoles: |
    - groups:
      - system:bootstrappers
      - system:nodes
      rolearn: arn:aws:iam::044650439222:role/worker_node_garima
      username: system:node:{{EC2PrivateDNSName}}
  mapUsers: |
    groups:
      - system:bootstrappers
      - system:nodes
      rolearn: arn:aws:iam::187632318301:user/diksha.tomar@tothenew.com
      username: diksha
kind: ConfigMap
metadata:
  creationTimestamp: "2020-03-09T09:43:13Z"
  name: aws-auth
  namespace: kube-system
  resourceVersion: "4107"
  selfLink: /api/v1/namespaces/kube-system/configmaps/aws-auth
  uid: 64dfac93-61ea-11ea-92d7-0e893341cf29
```

b. Enable a EC2 server to access Cluster master API without using access/secret key







Review policy

Name* new_eksctl_policy

Use alphanumeric and '+=,.@-_' characters. Maximum 128 characters.

Description

Maximum 1000 characters. Use alphanumeric and '+=,.@-_' characters.

Summary

Filter

Service	Access level	Resource	Request conditi
Allow (1 of 224 services) Show remaining 223			
EKS	**Full**: List, Read	Multiple	None

Create role

Attach permissions policies

Choose one or more policies to attach to your new role.

Create policy

Filter policies | new_eksctl_policy

		Policy name
☑	▸	new_eksctl_policy

Review

Provide the required information below and review this role before you create it.

Role name* new_eksctl_role

Use alphanumeric and '+=,.@-_' characters. Maximum 64 characters.

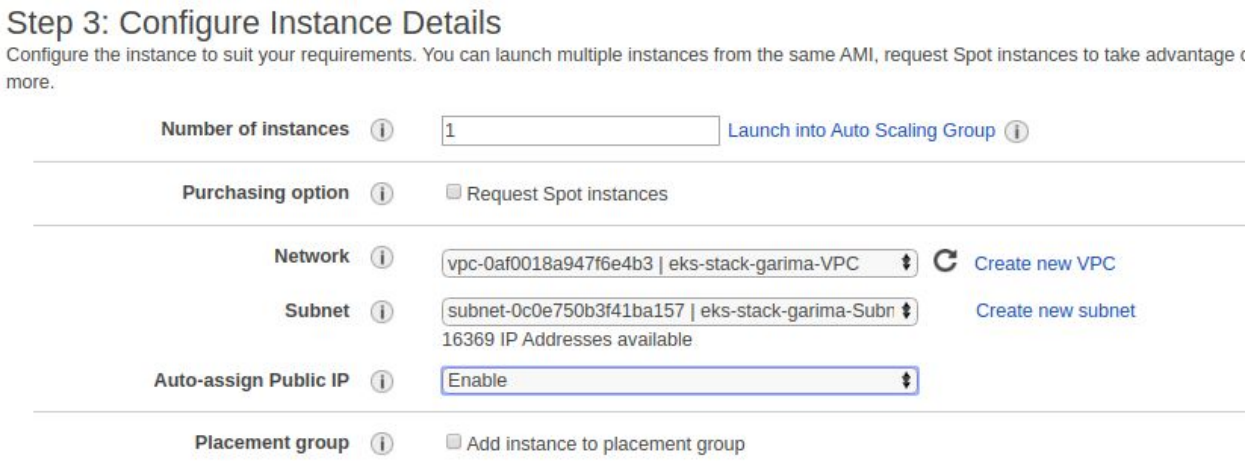
Role description Allows EC2 instances to call AWS services on your behalf.

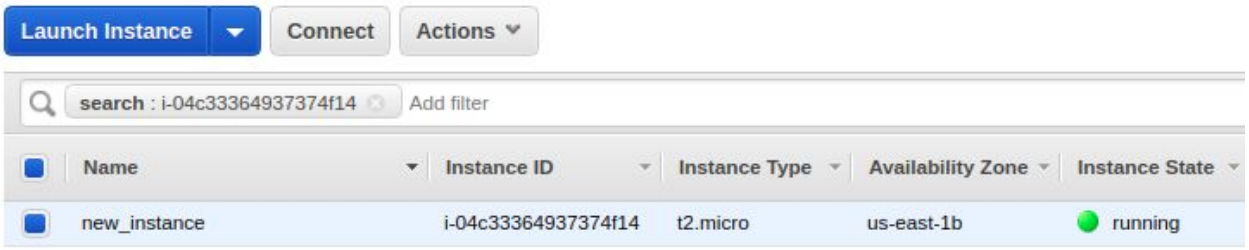
Maximum 1000 characters. Use alphanumeric and '+=,.@-_' characters.

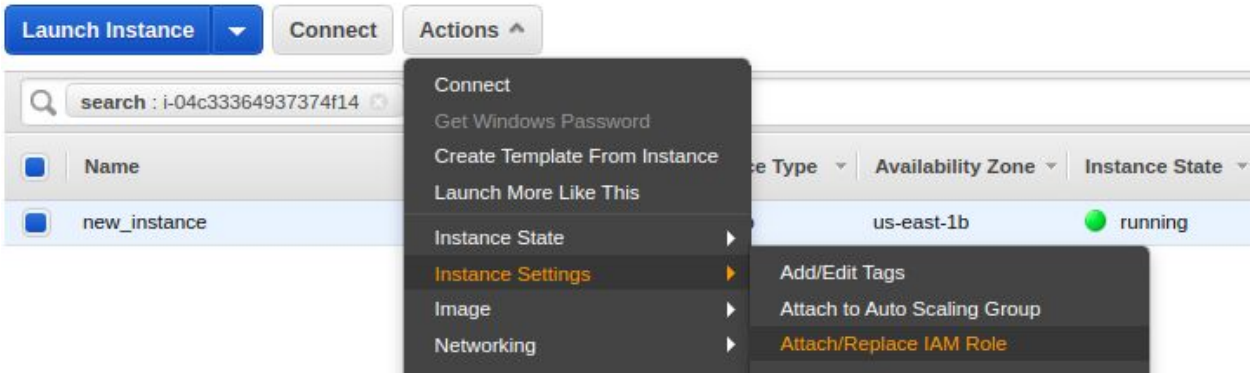
Trusted entities AWS service: ec2.amazonaws.com

Policies new_eksctl_policy

Now launch an instance and attach this role to that instance.







Attach/Replace IAM Role

Select an IAM role to attach to your instance. If you don't have any IAM roles, choose Create new IAM role to create a role in the IAM cor
If an IAM role is already attached to your instance, the IAM role you choose will replace the existing role.

Instance ID -

IAM role* new_eksctl_role Create new IAM role

```
garima@garima:~/Downloads$ ssh -i newawskeypair.pem ec2-user@3.233.222.221
Last login: Tue Mar 10 08:33:31 2020 from 122.162.179.136

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
1 package(s) needed for security, out of 26 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-192-168-134-172 ~]$ aws eks describe-cluster --name my-test --region us-east-1
{
    "cluster": {
        "status": "ACTIVE",
        "endpoint": "https://C8E12415423905061E2316B042113CA1.gr7.us-east-1.eks.amazonaws.com",
        "logging": {
            "clusterLogging": [
                {
                    "enabled": false,
                    "types": [
                        "api",
                        "audit",
                        "authenticator",
                        "controllerManager",
                        "scheduler"
                    ]
                }
            ]
        },
        "name": "my-test",
        "tags": {},
        "certificateAuthority": {
```

3. **Eksctl command to terminate the stack**