Elastic Kubernetes Service (EKS) Application Deployment

1. Firstly, deploy a EKS Cluster & node group with the required set of policies and role permissions using Terraform/ console. And then create a new AWS Linux EC2 or Cloud Shell and login in.

2. As it's an AWS Linux image, the AWS CLI is pre-installed, if not install it using the below link.

   - Install or update the latest version of the AWS CLI - AWS Command Line Interface (amazon.com)

3. So, now we need to configure the AWS credentials, which were used to deploy the cluster initially using the following commands.

   - aws configure

   Then, enter the respective access & secret keys, if required also the default region and verify the user identity using the below command.

   - aws sts get-caller-identity

4. Then, check if the cluster state is active and configure the kubectl file as follows.

   - aws eks --region <region_name> describe-cluster --name <cluster-name> --query cluster.status
   - aws eks --region <region_name> update-kubeconfig --name <cluster-name>

5. Now, install Kubectl in your Linux EC2/ Cloud Shell terminal using the following instructions.

   - curl -O https://s3.us-west-2.amazonaws.com/amazon-eks/1.28.1/2023-09-14/bin/linux/amd64/kubectl
   - chmod +x ./kubectl
   - mkdir -p $HOME/bin && cp ./kubectl $HOME/bin/kubectl && export PATH=$HOME/bin:$PATH

6. After successful installation of Kubectl, we now need to setup the eksctl in our instance using the below commands.

   - ➢ 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

7. Now, once the eksctl & kubectl setup is done, we need to configure our pods as follows.

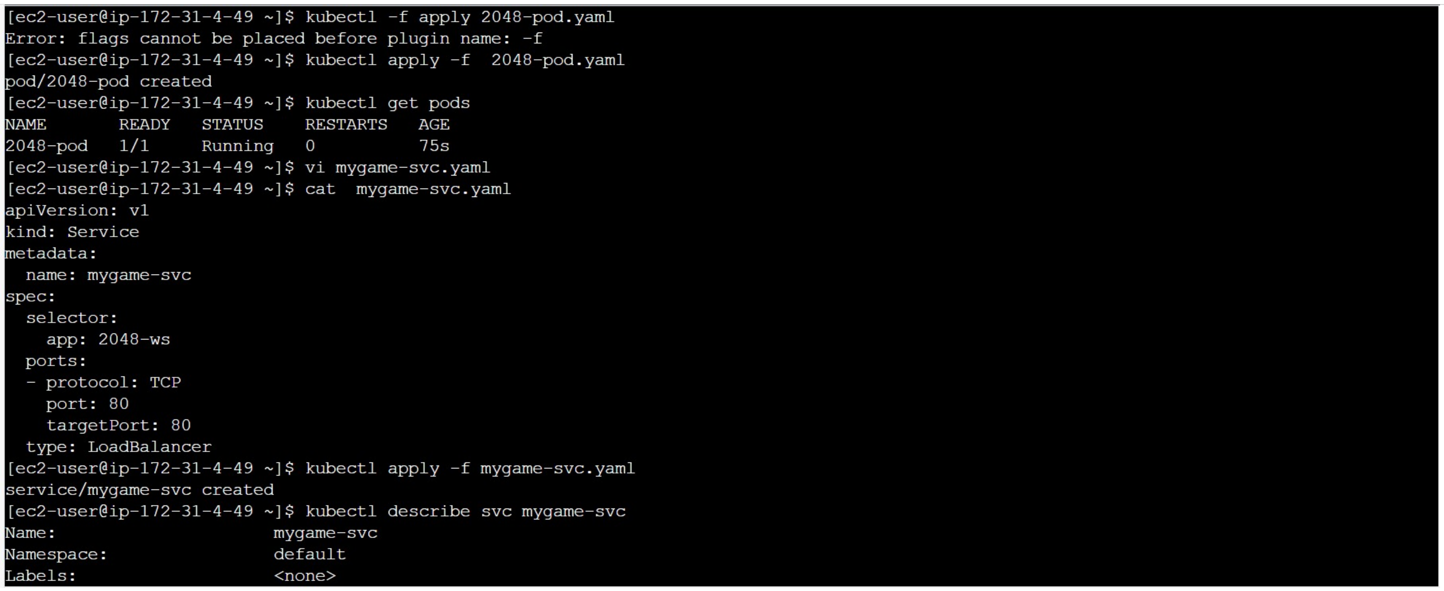
   - ➢ kubectl get nodes
   - ➢ kubectl get svc
   - ➢ kubectl get nodes –watch

8. Then, make use of yaml files or any suitable application deployment setup files to deploy the service. Here, we make use of 2 yaml files, one file to create a service and the second to deploy the service.
9. Create a yaml file with following configuration to create a service.
   - ➢ vi 2048-pod.yaml

   Ex:

```yaml
apiVersion: v1

kind: Pod

metadata:

  name: 2048-pod

  labels:

    app: 2048-ws

spec:

  containers:

  - name: 2048-container

    image: blackicebird/2048

    ports:

      - containerPort: 80
```

   - ➢ cat 2048-pod.yaml
   - ➢ kubectl apply -f 2048-pod.yaml
   - ➢ kubectl get pods



```
[ec2-user@ip-172-31-4-49 ~]$ kubectl -f apply 2048-pod.yaml
Error: flags cannot be placed before plugin name: -f
[ec2-user@ip-172-31-4-49 ~]$ kubectl apply -f  2048-pod.yaml
pod/2048-pod created
[ec2-user@ip-172-31-4-49 ~]$ kubectl get pods
NAME       READY   STATUS    RESTARTS   AGE
2048-pod   1/1     Running   0          75s
[ec2-user@ip-172-31-4-49 ~]$ vi mygame-svc.yaml
[ec2-user@ip-172-31-4-49 ~]$ cat  mygame-svc.yaml
apiVersion: v1
kind: Service
metadata:
  name: mygame-svc
spec:
  selector:
    app: 2048-ws
  ports:
  - protocol: TCP
    port: 80
    targetPort: 80
  type: LoadBalancer
[ec2-user@ip-172-31-4-49 ~]$ kubectl apply -f mygame-svc.yaml
service/mygame-svc created
[ec2-user@ip-172-31-4-49 ~]$ kubectl describe svc mygame-svc
Name:                     mygame-svc
Namespace:                default
Labels:                   <none>
```

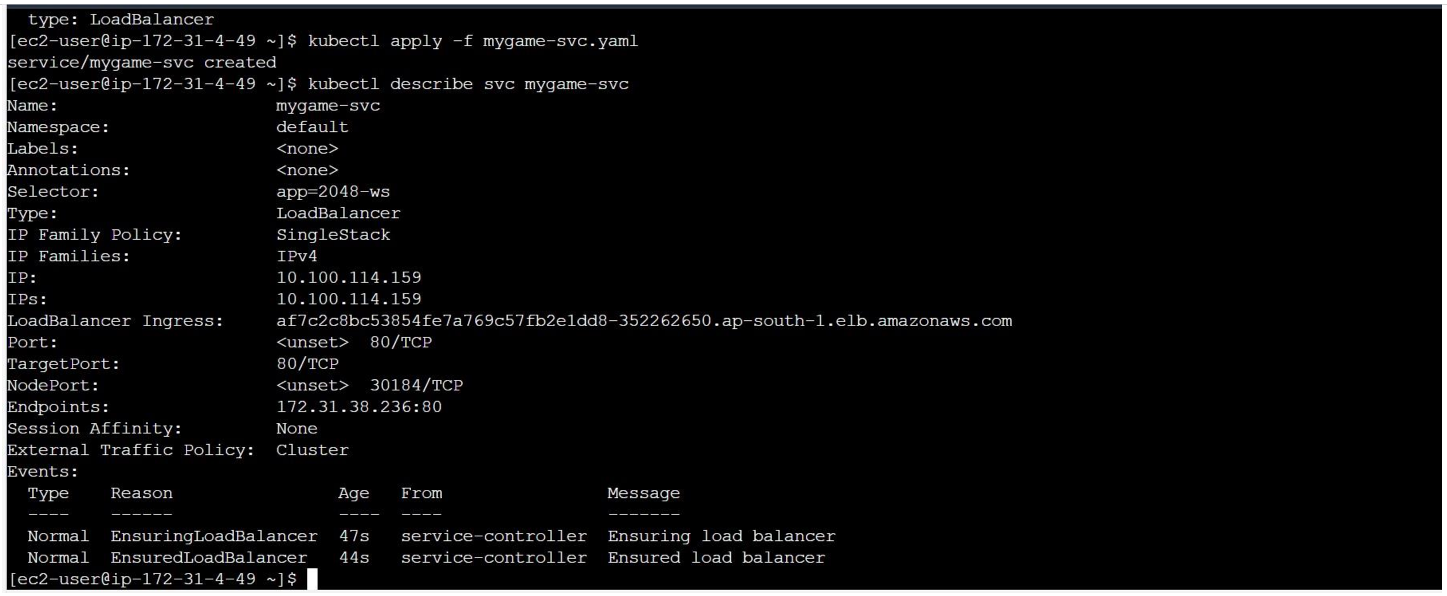
10. Create another yaml file, which is used to deploy the service.

- vi mygame-svc.yaml

Ex:

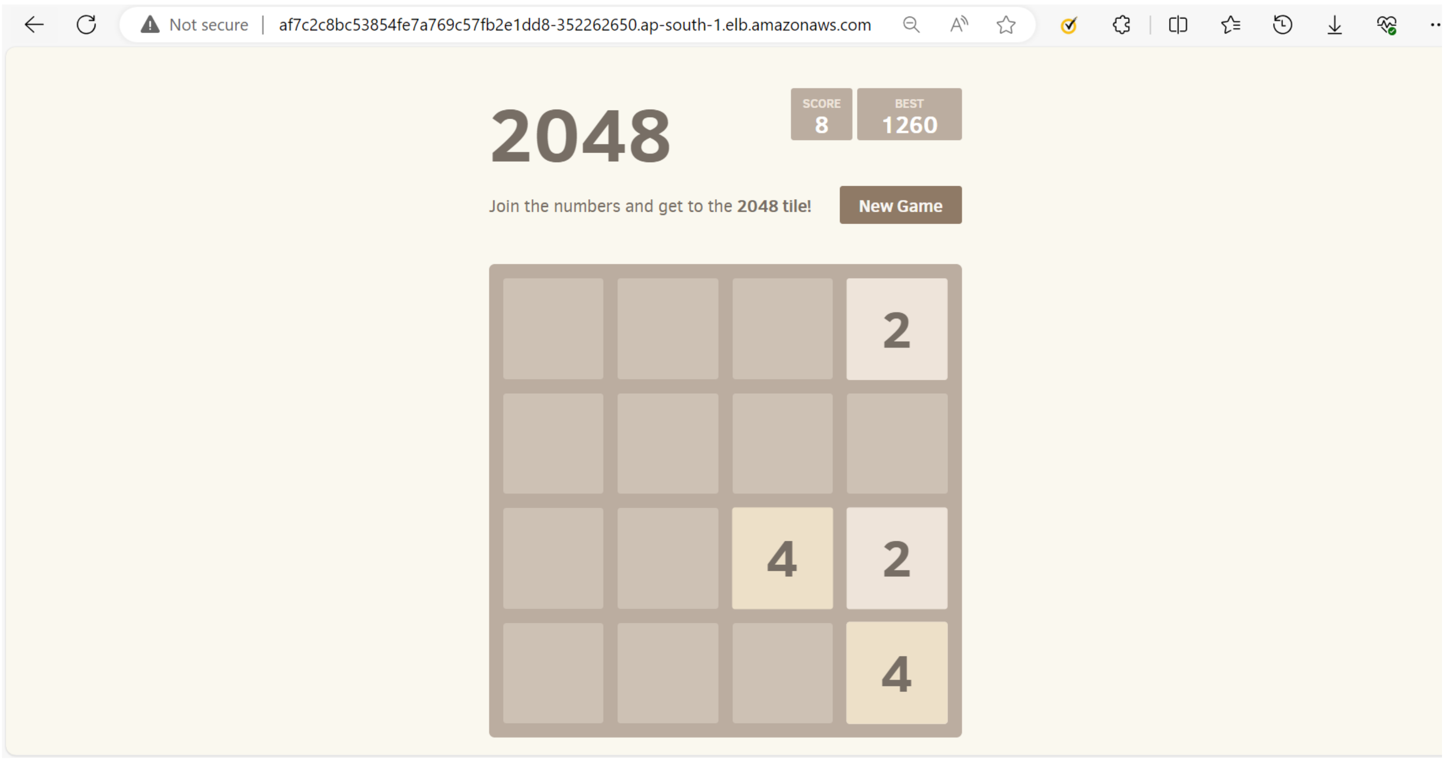
```
      apiVersion: v1
kind: Service
metadata:
  name: mygame-svc
spec:
  selector:
    app: 2048-ws
  ports:
  - protocol: TCP
    port: 80
    targetPort: 80
  type: LoadBalancer
```

- cat mygame-svc.yaml
- kubectl apply -f mygame-svc.yaml
- kubectl describe svc mygame-svc



```
  type: LoadBalancer
[ec2-user@ip-172-31-4-49 ~]$ kubectl apply -f mygame-svc.yaml
service/mygame-svc created
[ec2-user@ip-172-31-4-49 ~]$ kubectl describe svc mygame-svc
Name:                     mygame-svc
Namespace:                default
Labels:                   <none>
Annotations:              <none>
Selector:                 app=2048-ws
Type:                     LoadBalancer
IP Family Policy:         SingleStack
IP Families:              IPv4
IP:                       10.100.114.159
IPs:                      10.100.114.159
LoadBalancer Ingress:     af7c2c8bc53854fe7a769c57fb2e1dd8-352262650.ap-south-1.elb.amazonaws.com
Port:                     <unset>  80/TCP
TargetPort:               80/TCP
NodePort:                 <unset>  30184/TCP
Endpoints:                172.31.38.236:80
Session Affinity:         None
External Traffic Policy:  Cluster
Events:
  Type    Reason                Age   From                Message
  ----    ------                ----  ----                -------
  Normal  EnsuringLoadBalancer  47s   service-controller  Ensuring load balancer
  Normal  EnsuredLoadBalancer   44s   service-controller  Ensured load balancer
[ec2-user@ip-172-31-4-49 ~]$
```

11. Now, copy the link opposite to Load Balancer Ingress in the CLI, or move to Load Balancer in EC2 section of AWS console and copy the DNS Name of the LB and , and then render the service in the web to deploy the application. Make sure that the Port number 80, 8080 are enabled in the Cluster's Security Group.


Not secure
af7c2c8bc53854fe7a769c57fb2e1dd8-352262650.ap-south-1.elb.amazonaws.com
2048
SCORE 8
BEST 1260
Join the numbers and get to the 2048 tile!
New Game
2
4
2
4