

Successfully completed the TASK given by Mr. Vimal Daga Sir in EKS Training at LinuxWorld Information Pvt Ltd.

The objective of the task was to:

1. Create Kubernetes Cluster using AWS EKS.
2. Integrate of EKS with Services like Ec2, EBS, EFS, LB.
3. Create a Multi-tier Architecture of Wordpress & MySQL on the top of EKS
4. Using Helm to install Prometheus and Grafana
5. Create a Server less Architecture by Fargate Cluster EKS(Elastic Kubernetes Services)

Amazon EKS is a managed service that makes it easy for you to run Kubernetes on the AWS without need to stand up or maintain your own Kubernetes control plane. Kubernetes is an open-source system for automating the deployment, scaling and management of containerized applications.

Amazon EKS runs Kubernetes control plane instances across multiple Availability Zones to ensure high availability. Amazon EKS detects and replaces unhealthy control plane instances, and it provides automated version upgrades and patching for them.

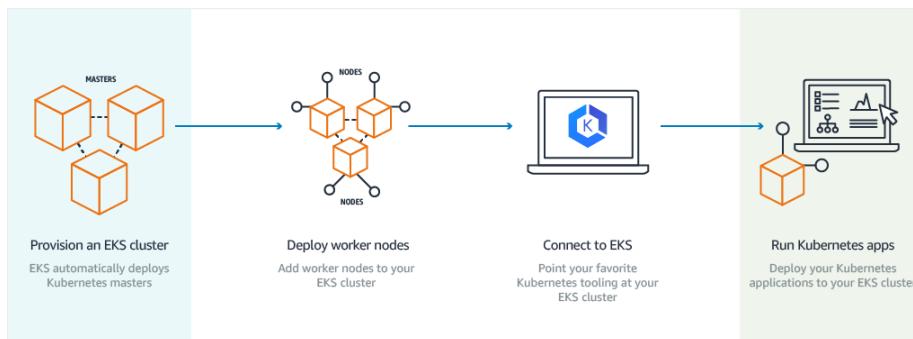
Amazon EKS is also integrated with many AWS services to provide scalability and security for your applications, including the following:

Amazon ECR for container images

Elastic Load Balancing for Load Distribution

IAM for authentication

Amazon VPC for isolation



EKS is the best place to run Kubernetes for several reasons. First, you can choose to run your EKS clusters using AWS Fargate, which is serverless compute for containers. Fargate removes the need to provision and manage servers, lets you specify and pay for resources per application, and improves security through application isolation by design. Second, EKS is deeply integrated with services such as Amazon CloudWatch, Auto Scaling Groups, AWS Identity and Access Management (IAM), and Amazon Virtual Private Cloud (VPC), providing you a seamless experience to monitor, scale, and load-balance your applications. Third, EKS integrates with AWS App Mesh and provides a Kubernetes native experience to consume service mesh features and bring rich observability, traffic controls and security features to applications. Additionally, EKS provides a scalable and highly-available control plane that runs across multiple availability zones to eliminate a single point of failure.

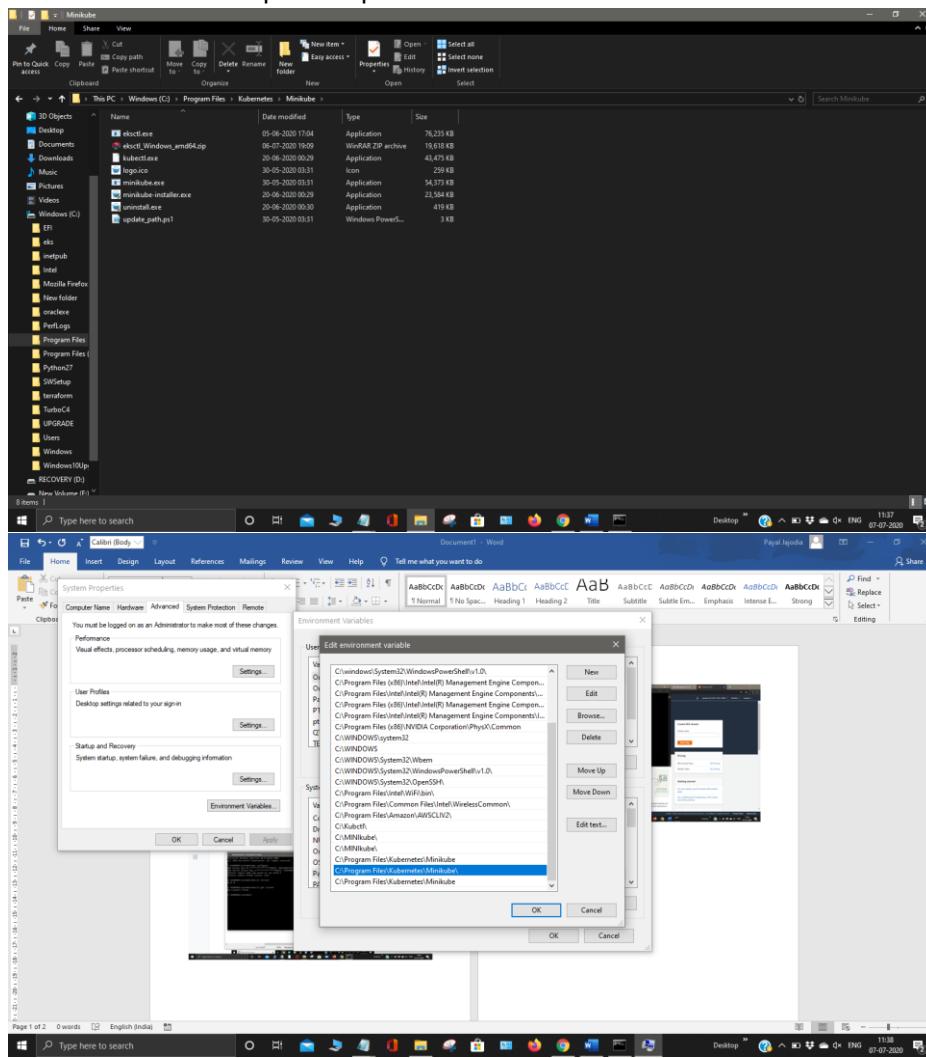
- First create an Amazon EKS Cluster in the AWS Management Console or with the AWS CLI or one of the AWS SDKs.

- Then, launch worker nodes that register with the Amazon EKS cluster. We provide you with an AWS CloudFormation template that automatically configures your nodes.
- When your cluster is ready you can configure Kubernetes tools to communicate with your cluster.
- Deploy and manage applications on Amazon EKS Cluster the same way that you would perform with any other Kubernetes environment.

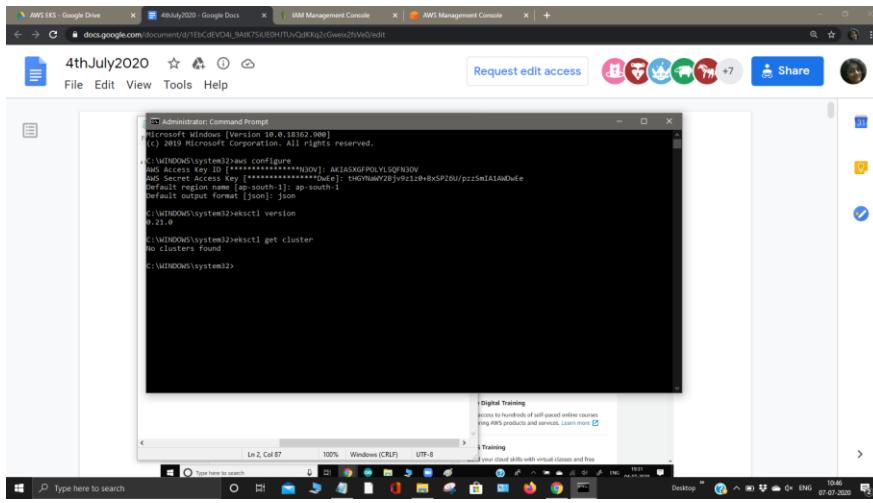
With Amazon EKS, you can take advantage of all the performance, scale, reliability, and availability of the AWS platform, as well as integrations with AWS networking and security services, such as Application Load Balancers for load distribution, Identity Access Manager (IAM) for role based access control, and Virtual Private Cloud (VPC) for pod networking.

Starting with the task

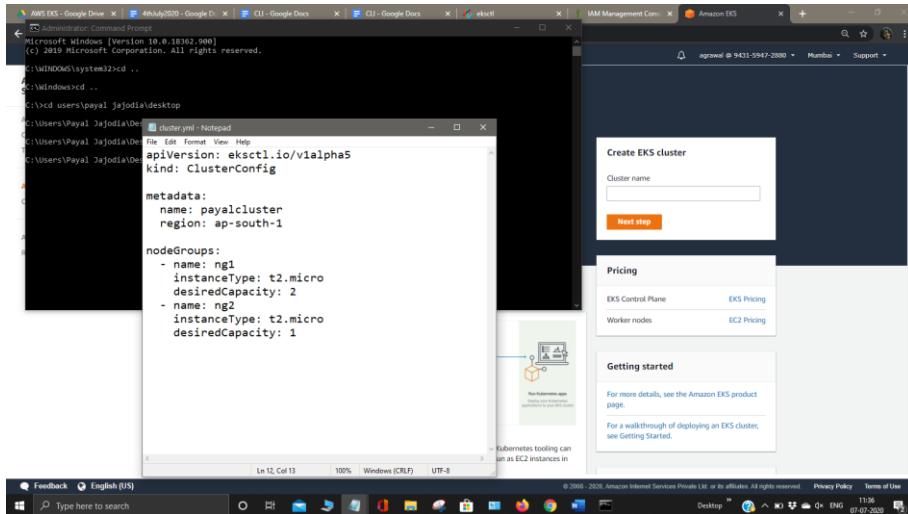
Install eksctl.exe and provide path in the environmental variables



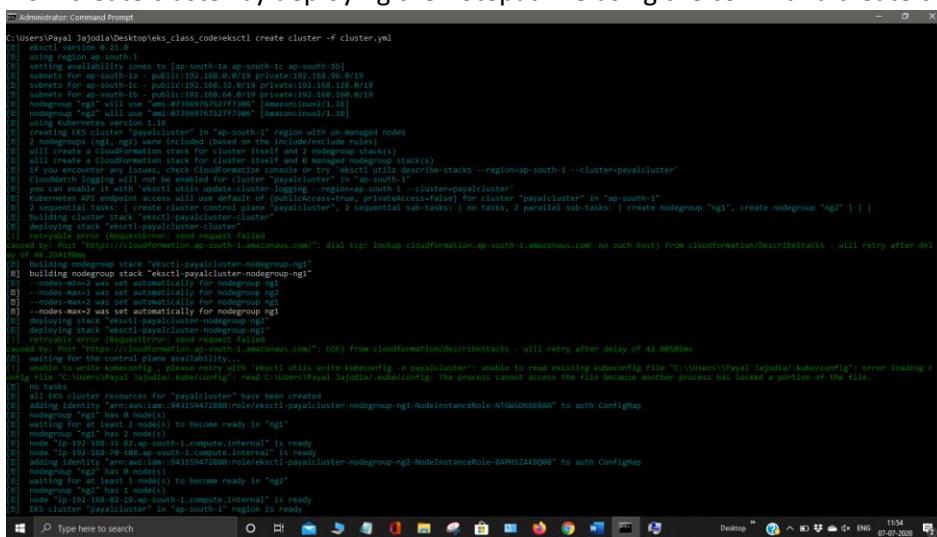
First login to your AWS account by providing the access key ID and secret access key.



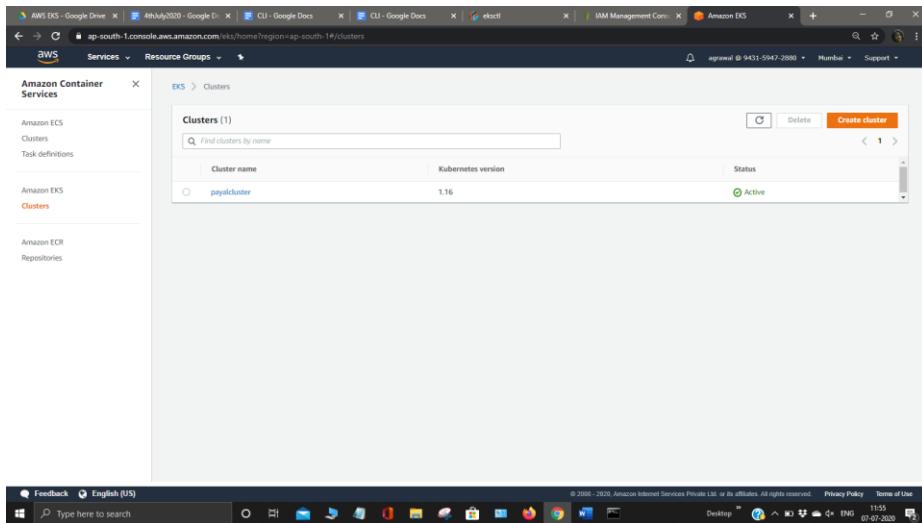
Now create a folder on desktop by name eks_class_cloud and create a notepad file by name cluster.yml



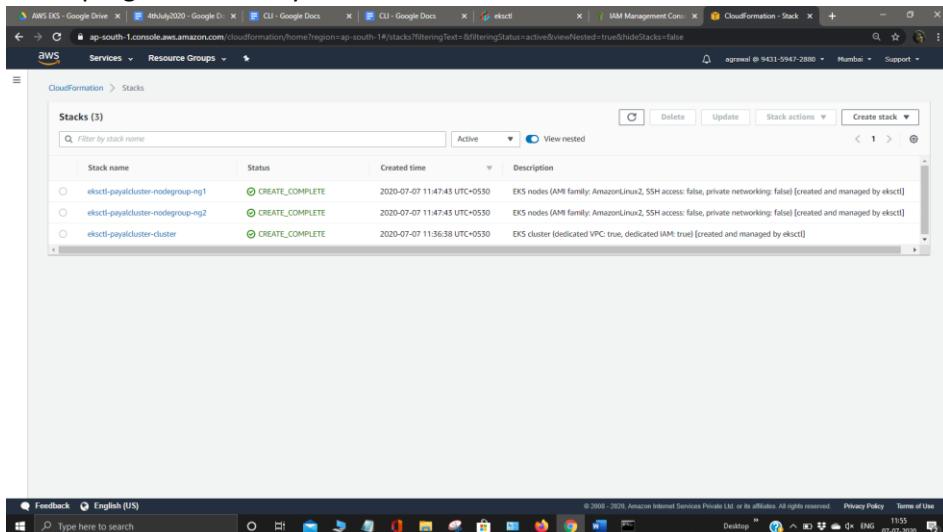
Now create cluster by deploying the notepad file using the command create cluster -f cluster.yml



The cluster name payalcluster will be created.



Eksctl program internally creates cloudformation astack for cluster automatically.



Now open another command prompt and type the command `kubectl config view` and it will list certain things. For connecting to the master we require configure file that contains IP , username and password. AWS automatically creates this file and we can view the config file using `aws eks update-kubeconfig –name cluster` .

Now update your ekscluster i.e. payalcluster

The image displays three identical Windows desktop environments, each showing a terminal window with the following command history:

```

C:\Users\Payal.Jajodia\kubex>kubectl config view
apiVersion: v1
clusters: []
contexts: []
currentContext: --
kind: Config
preferences: {}
users: []

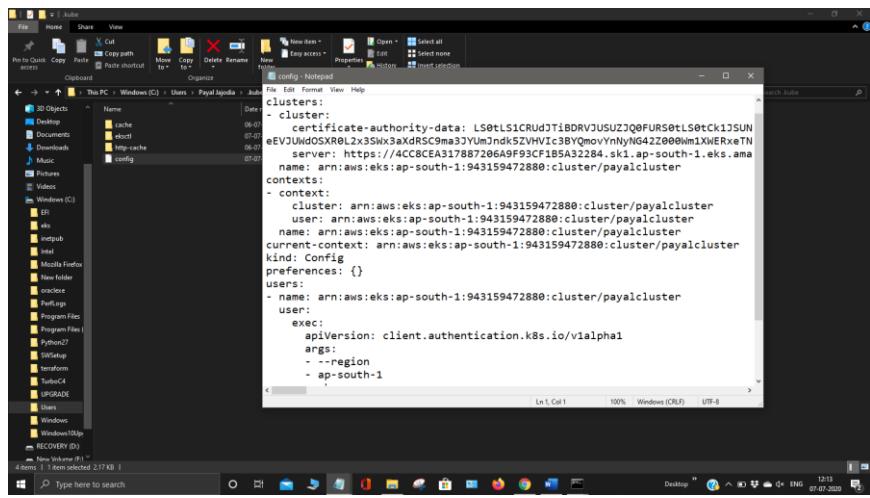
C:\Users\Payal.Jajodia\kubex>eks update-kubeconfig --name paypalcluster
Added new context arn:aws:eks:ap-south-1:943159472880:cluster/paypalcluster to C:\Users\Payal.Jajodia\.kube\config

C:\Users\Payal.Jajodia\kubex>

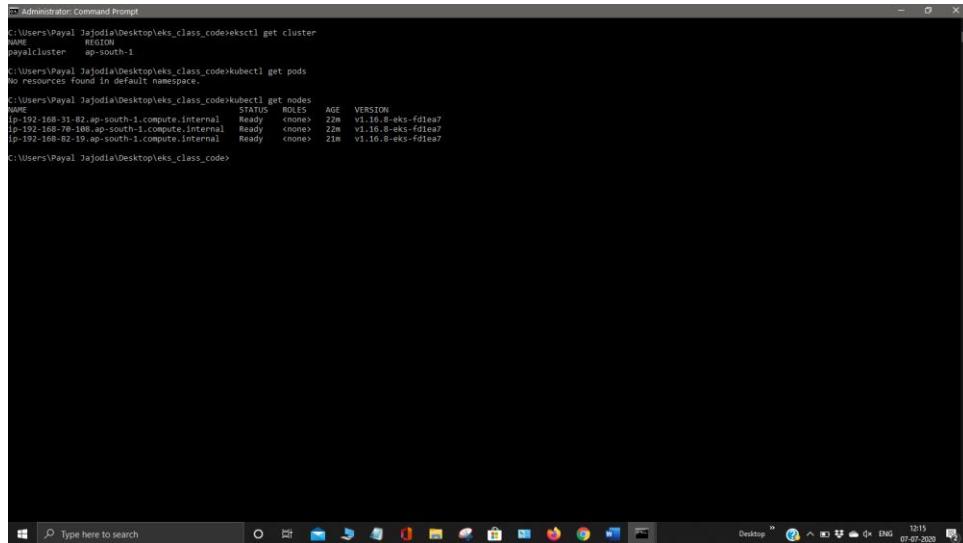
```

Below the terminal, a file explorer window shows the path `C:\Users\Vimal Daga`. The desktop taskbar at the bottom of each screen lists several open tabs, including Google Drive, Google Docs, and IAM Management Console.

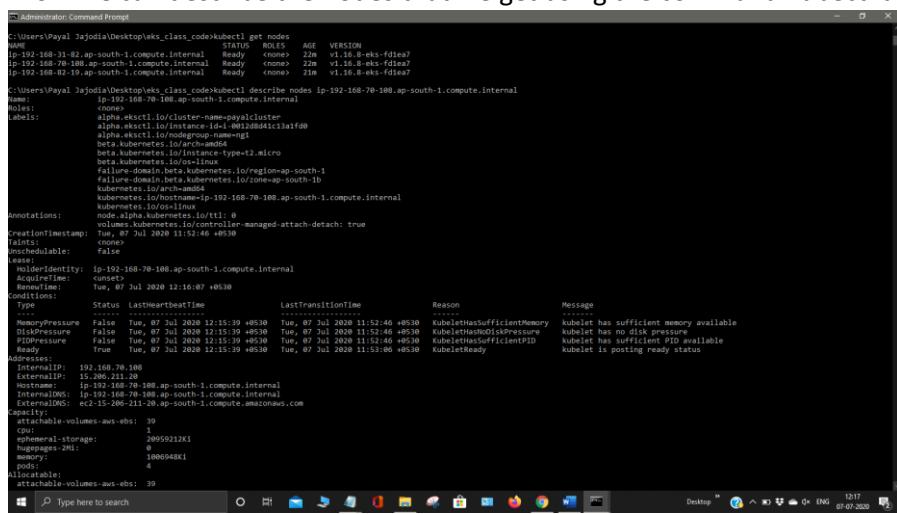
In the eks_class_cloud a config file will be automatically created as shown below.



Now we can check that the cluster made using the command `eksctl get cluster` to get all the clusters. Now get the pods and nodes to get all the pods by using command `kubectl get nodes` or `kubectl get pods`.



Now we can describe the nodes that we get using the command `kubectl describe <node name>`



Now we have to create a namespace by the command `eksctl create namespace <name>`. We can also check the namespaces created using the command `kubectl get ns`

```
C:\Users\Payal>Administrator: Command Prompt  
Normal Starting 2m kube-proxy, ip:192.168.70.100.ap-south-1.compute.internal Starting kube-proxy.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get pods  
No resources found in default namespace.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get ns  
default Active 32m  
kube-node-lease Active 32m  
kube-public Active 32m  
kube-system Active 32m  
pushat1 Active 12s  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl create namespace pushat1  
namespace pushat1 created  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get ns  
default Active 32m  
kube-node-lease Active 32m  
kube-public Active 32m  
kube-system Active 32m  
pushat1 Active 12s  
C:\Users\Payal>jajodia\Desktop\eks_class_code>
```

Now get cluster info by the use of the command kubectl cluster-info

```
C:\Users\Payal>Administrator: Command Prompt  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl config set-context --current --namespace=pushat1  
Context "pushat1" is already selected.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get pods  
No resources found in pushat1 namespace.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get pods  
No resources found in pushat1 namespace.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl cluster-info  
Kubernetes master is running at https://ACCCBCEA17887206A0F93CF1B5A32284.sk1.ap-south-1.eks.amazonaws.com  
CoreDNS is running at https://ACCCBCEA17887206A0F93CF1B5A32284.sk1.ap-south-1.eks.amazonaws.com/api/v1/namespaces/kube-system/services/kube-dns/dns/proxy  
To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get ns  
default Active 32m  
kube-node-lease Active 32m  
kube-public Active 32m  
kube-system Active 32m  
pushat1 Active 5m28s  
C:\Users\Payal>jajodia\Desktop\eks_class_code>
```

Now get create deployment by using kubectl create deployment myweb1 – image=vimal13/apache-webserver-php

Now get all pods and all the nodes using the command kubectl get nodes and kubectl get pods

```
C:\Users\Payal>Administrator: Command Prompt  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl cluster-info  
Kubernetes master is running at https://ACCCBCEA17887206A0F93CF1B5A32284.sk1.ap-south-1.eks.amazonaws.com  
CoreDNS is running at https://ACCCBCEA17887206A0F93CF1B5A32284.sk1.ap-south-1.eks.amazonaws.com/api/v1/namespaces/kube-system/services/kube-dns/dns/proxy  
To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get ns  
default Active 32m  
kube-node-lease Active 32m  
kube-public Active 32m  
kube-system Active 32m  
pushat1 Active 5m28s  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl create deployment myweb1 --image=vimal13/apache-webserver-php  
deployment.apps/myweb1 created  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get pods  
NAME          READY   STATUS    RESTARTS   AGE  
myweb1-7b885b4ccb-lbvq4  1/1   Running   0          31s  
C:\Users\Payal>jajodia\Desktop\eks_class_code>kubectl get pods  
NAME          READY   STATUS    RESTARTS   AGE  
myweb1-7b885b4ccb-lbvq4  1/1   Running   0          37s  
C:\Users\Payal>jajodia\Desktop\eks_class_code>
```

Now get detailed information of the nodes using the command kubectl get pods -o wide. And also get the replicas by using the command kubectl create deployment myweb1 –replicas = 3

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
myweb1-7b885b4cbb-lbvq4   1/1    Running   0          31s
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods -o wide
NAME           READY   STATUS    RESTARTS   AGE   IP           NOMINATED NODE   READINESS GATES
myweb1-7b885b4cbb-lbvq4   1/1    Running   0          8m   192.168.31.82.ap-south-1.compute.internal   <none>
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl scale deployment myweb1 --replicas=3
error: unknown flag: --replicas
See 'kubectl scale --help' for usage.
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl scale deployment myweb1 --replicas=3
deployment.apps/myweb1 scaled
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
myweb1-7b885b4cbb-2j24x   0/1    ContainerCreating   0          11s
myweb1-7b885b4cbb-5ahdr   0/1    ContainerCreating   0          10s
myweb1-7b885b4cbb-lbvq4   1/1    Running   0          82m
C:\Users\Payal.Jajodia\Desktop\eks_class_code>

```

Now expose your deployment scale it with the help of load balancer by using the command kubectl expose deployment myweb1 –type LoadBalancer –port =80.

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
myweb1-7b885b4cbb-2j24x   0/1    ContainerCreating   0          11s
myweb1-7b885b4cbb-5ahdr   0/1    ContainerCreating   0          10s
myweb1-7b885b4cbb-lbvq4   1/1    Running   0          82m
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get services
No resource found in pushati namespace.
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get deployment
error: the server doesn't have a resource type "deployment"
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get deployment
NAME   READY   UP-TO-DATE   AVAILABLE   AGE
myweb1   3/3     3           3           85m
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl expose deployment myweb1 --type=LoadBalancer --port=80
service/myweb1 exposed
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get services
NAME   TYPE      CLUSTER-IP   EXTERNAL-IP
myweb1   LoadBalancer   10.100.140.18   a968271281c264183839cb054c13850c-1705668690.ap-south-1.elb.amazonaws.com   80:31007/TCP   52s
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get all
NAME           READY   STATUS    RESTARTS   AGE
pod/myweb1-7b885b4cbb-2j24x   1/1    Running   0          5m52s
pod/myweb1-7b885b4cbb-5ahdr   1/1    Running   0          5m51s
pod/myweb1-7b885b4cbb-lbvq4   1/1    Running   0          88m
NAME           TYPE      CLUSTER-IP   EXTERNAL-IP
service/myweb1   LoadBalancer   10.100.140.18   a968271281c264183839cb054c13850c-1705668690.ap-south-1.elb.amazonaws.com   80:31007/TCP   64s
NAME   READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/myweb1   3/3     3           3           88m
NAME   DESIRED   CURRENT   READY   AGE
replicaset.apps/myweb1-7b885b4cbb   3     3     3     88m
C:\Users\Payal.Jajodia\Desktop\eks_class_code>

```

Now get your all pods using the command kubectl get all and to describe the webserver use the command kubectl describe service/myweb1.

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get all
NAME           READY   STATUS    RESTARTS   AGE
pod/myweb1-7b885b4cbb-2j24x   1/1    Running   0          5m52s
pod/myweb1-7b885b4cbb-5ahdr   1/1    Running   0          5m51s
pod/myweb1-7b885b4cbb-lbvq4   1/1    Running   0          88m
NAME           TYPE      CLUSTER-IP   EXTERNAL-IP
service/myweb1   LoadBalancer   10.100.140.18   a968271281c264183839cb054c13850c-1705668690.ap-south-1.elb.amazonaws.com   80:31007/TCP   64s
NAME   READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/myweb1   3/3     3           3           88m
NAME   DESIRED   CURRENT   READY   AGE
replicaset.apps/myweb1-7b885b4cbb   3     3     3     88m
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl describe service/myweb1
Name:         myweb1
Namespace:    pushati
Labels:        app=app-myweb1
Annotations:   
Selector:     app=app-myweb1
Type:         LoadBalancer
IP:          10.100.140.18
LoadBalancer Ingress:  a968271281c264183839cb054c13850c-1705668690.ap-south-1.elb.amazonaws.com
Port:        80/TCP
TargetPort:   80/TCP
NodePort:    31007/TCP
Endpoints:   192.168.44.44:80,192.168.70.55:80,192.168.74.120:80
Session Affinity: None
External Traffic Policy: Cluster
Events:
  Type  Reason     Age   From           Message
  ----  ----     --   --            --
  Normal  EnsuringLoadBalancer  2m4s  service-controller  Ensuring load balancer
  Normal  EnsuredLoadBalancer  2m   service-controller  Ensured load balancer
C:\Users\Payal.Jajodia\Desktop\eks_class_code>

```

Now go to your console and check for the instances created

Go to your security groups and check for the new eksctl security groups created.

Now check for the volumes created by the eksctl cluster and Load Balancer

Also check for the Elastic IP created by the eksctl cluster and also the network interfaces.

Now use anyone of the Load Balancer URL and browse it you will get following screen.

```

aws eks --region ap-south-1 get-instances --cluster myeks
  
```

Now get all the services using kubectl services

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl delete all --all
pod "myweb1-7b8854ccb-224x" deleted
pod "myweb1-7b8854ccb-58hd" deleted
pod "myweb1-7b8854ccb-lbqvq" deleted
service "myweb1" deleted
deployment.apps "myweb1" deleted
replicaset.apps "myweb1-7b8854ccb" deleted

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
No resources found in pushati namespace.

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create deployment myweb1 --image=vimal13/apache-webserver-php
deployment.apps "myweb1" created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
myweb1-7b8854ccb-ppj54   1/1   Running   0          75s
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl scale deployment myweb1 --replicas=3
deployment.apps "myweb1" scaled

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods -o wide
NAME          READY   STATUS    RESTARTS   AGE   CLUSTER-IP      EXTERNAL-IP   PORT(S)           MODE   NODE   READINESS GATES
myweb1-7b8854ccb-ppj54   1/1   Running   0          75s   192.168.82.19   <none>        80/TCP            NODENAME   <none>
myweb1-7b8854ccb-ttg72   1/1   Running   0          50s   192.168.14.64   ip-192-168-31-82.ap-south-1.compute.internal   <none>   <none>
myweb1-7b8854ccb-nth5   0/1   ContainerCreating   0          50s   192.168.31.82.ap-south-1.compute.internal   <none>   <none>

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl expose deployment myweb1 --type=LoadBalancer --port=80
service "myweb1" exposed

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get services
NAME        TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)        AGE
myweb1     LoadBalancer 10.100.156.52   a087294a0051144809cf16d15212c28c-787330241.ap-south-1.elb.amazonaws.com  80:32713/TCP   9s
  
```

Now go to your one of the pods using kubectl exec -it podname –bash command and update one of your index.php file to see the working of Load Balancer .

```

@myweb1:7b885b4ccb-ppj54[~]/var/www/html
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
myweb1-7b885b4ccb-ppj54  1/1     Running   0          3m16s
myweb1-7b885b4ccb-trg72  1/1     Running   0          2m05s
myweb1-7b885b4ccb-trn72  1/1     Running   0          2m05s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl exec -it myweb1-7b885b4ccb-ppj54 bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
[root@myweb1-7b885b4ccb-ppj54 ~]# ls
bin  lib  lib64  lostfound  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  var  var

[root@myweb1-7b885b4ccb-ppj54 ~]# ps aux
USER      PID %CPU %MEM VSZ RSS TTY STAT START TIME COMMAND
root      1 0.0  1.0 307840 1892 ? S 00:45 0:00 /bin/sh /bin/httpd -DFOREGROUND
apache    6 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache    7 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache    8 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache    9 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache   10 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
root     11 0.0  1.0 307840 1892 ? S 00:49 0:00 bash
root     25 0.0  0.3 47448 3208 pts/0  * 00:50 0:00 ps aux
[root@myweb1-7b885b4ccb-ppj54 ~]# cd /var/www/html/
[root@myweb1-7b885b4ccb-ppj54 html]# ls
[root@myweb1-7b885b4ccb-ppj54 html]#

```

Now copy this to var/www/html

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
myweb1-7b885b4ccb-ppj54  1/1     Running   0          3m16s
myweb1-7b885b4ccb-trg72  1/1     Running   0          2m05s
myweb1-7b885b4ccb-trn72  1/1     Running   0          2m05s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl exec -it myweb1-7b885b4ccb-ppj54 bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
[root@myweb1-7b885b4ccb-ppj54 ~]# ls
bin  lib  lib64  lostfound  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  var  var

[root@myweb1-7b885b4ccb-ppj54 ~]# ps aux
USER      PID %CPU %MEM VSZ RSS TTY STAT START TIME COMMAND
root      1 0.0  1.0 307840 1892 ? S 00:45 0:00 /bin/sh /bin/httpd -DFOREGROUND
apache    6 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache    7 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache    8 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache    9 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
apache   10 0.0  1.0 307840 1892 ? S 00:45 0:00 /usr/sbin/httpd -DFOREGROUND
root     11 0.0  0.2 11776 3020 pts/0  * 00:49 0:00 bash
root     23 0.0  0.0 1070 1076 pts/0  * 00:50 0:00 ps aux
[root@myweb1-7b885b4ccb-ppj54 ~]# cd /var/www/html/
[root@myweb1-7b885b4ccb-ppj54 html]# ls
[root@myweb1-7b885b4ccb-ppj54 html]# exit
exit
C:\Users\Payal.Jajodia\Desktop\eks_class_code>dir
Volume in Drive C is windows
Volume Serial Number is 2E35-F70B

Directory of C:\Users\Payal.Jajodia\Desktop\eks_class_code

07-07-2020 10:48 <DIR> .
07-07-2020 10:48 <DIR> ..
07-07-2020 11:35 257 cluster.yml
               4 File(s)        457 bytes
              2 Dir(s)  799,293,767,688 bytes free

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
myweb1-7b885b4ccb-ppj54  1/1     Running   0          5m56s
myweb1-7b885b4ccb-trg72  1/1     Running   0          5m44s
myweb1-7b885b4ccb-trn72  1/1     Running   0          4m49s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl cp index.php myweb1-7b885b4ccb-ppj54:/var/www/html/index.php
C:\Users\Payal.Jajodia\Desktop\eks_class_code>

```

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl cp index.php myweb1-7b885b4ccb-ppj54:/var/www/html/index.php
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl describe pods myweb1-7b885b4ccb-ppj54
Name:           myweb1-7b885b4ccb-ppj54
Namespace:      default
Priority:       0
PriorityClassName:  pushshift
Tolerations:    []
Annotations:   kubernetes.io/pod: eks.privileged
Status:         Running
IP:             192.168.70.55
IPs:            192.168.70.55
Controlled By:  Replicaset/myweb1-7b885b4ccb
Containers:
  webserver-php:
    Container ID:  docker://3cfad21baef5256e66ccb6541af2166c9aca44bc5d7dbb3010b2b4df02a28ad1
    Image:          vimal13/apache-webserver-php
    Image ID:      docker://3cfad21baef5256e66ccb6541af2166c9aca44bc5d7dbb3010b2b4df02a28ad1
    Port:          <none>
    Host Port:    <none>
    State:         Running
    Last Start:   Tue, 07 Jul 2020 14:15:45 +0530
    Ready:         True
    Reasons:      <none>
    Containers Ready: 1
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-qq9uz (ro)
    Conditions:
      Type        Status
      Initialized  True
      Ready       True
      ContainersReady  True
      PodScheduled  True
Events:
  Type      Reason     Age   From           Message
  Normal    Scheduled  9m7s   default-scheduler   Successfully assigned pushshift/myweb1-7b885b4ccb-ppj54 to ip-192-168-82-19.ap-south-1.compute.internal
  Normal    Pulling    9m7s   kubelet, ip-192-168-82-19.ap-south-1.compute.internal  Pulling image "vimal13/apache-webserver-php"
  Normal    Pulled    9m5s   kubelet, ip-192-168-82-19.ap-south-1.compute.internal  Successfully pulled image "vimal13/apache-webserver-php"
  Normal    Created    9m5s   kubelet, ip-192-168-82-19.ap-south-1.compute.internal  Created container webserver-php
  Normal    Started    9m5s   kubelet, ip-192-168-82-19.ap-south-1.compute.internal  Started container webserver-php
  Normal    Sidecar   9m5s   kubelet, ip-192-168-82-19.ap-south-1.compute.internal  Container webserver-php is running
  Normal    QoSFailed  9m5s   kubelet, ip-192-168-82-19.ap-south-1.compute.internal  Container webserver-php is not ready:QoSExecute=300ms
  Normal    Tolerations 9m5s   node.kubernetes.io/not-ready:NoExecute=300ms, node.kubernetes.io/unreachable:NoExecute=300ms

```

Now edit the sc gp2 using kubectl describe sc gp2

```
C:\Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
mysql-7088545c20-tchns   1/1   Running   0          10m
mysql-7088545c20-wrkn   0/1   ContainerCreating   0          23s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
mysql-7088545c20-tchns   1/1   Running   0          10m
mysql-7088545c20-wrkn   0/1   Running   0          50s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pvc
No resources found in pushat namespace.

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc
Name: gp2
provisioner: kubernetes.io/aws-ebs
annotations: kubetc.kubernetes.io/last-applied-configuration={"apiVersion":"storage.k8s.io/v1","kind":"StorageClass","metadata":{"annotations":{"storageclass.kubernetes.io/is-default-class":true}},"name":"gp2"},parameters:{"fsType":"ext4","type":gp2},provisioner:"kubernetes.io/aws-ebs",volumeBindingMode:"WaitForFirstConsumer"
parameters: {"fsType": "ext4", "type": "gp2"}
provisioner: "kubernetes.io/aws-ebs"
allowVolumeExpansion: <none>
mountOptions: <none>
volumeBindingMode: WaitForFirstConsumer
events: <none>

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pvc
No resources found in pushat namespace.

C:\Users\Payal.Jajodia\Desktop\eks_class_code>
```

Now get the storage class using kubectl get sc

```
C:\Administrator: Command Prompt
error: the path "pvc.yml" does not exist
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc gp2
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  37m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f sc.yaml
error: the path "sc.yaml" does not exist

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f sc.yaml
storageclass.storage.k8s.io/payalsc1 created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f pvc.yaml
persistentvolumeclaim/payalsc1 created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc gp2
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  17m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>notepad sc.yaml
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f sc.yaml
storageclass.storage.k8s.io/payalsc1 created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc gp2
error: the server doesn't have a resource type "sc"
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc gp2
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  17m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pvc
NAME          STATUS    VOLUME          CAPACITY   ACCESS MODES  STORAGECLASS   AGE
payalsc1      Bound    pvc-dda71d25-95a4-4ed1-8b49-10bf156ec294  10Gi      RWO          payalsc1       7m7s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pv
NAME          CAPACITY   ACCESS MODES  RECLAIM POLICY  STATUS   CLAIM          BOUND   STORAGECLASS   REASON   AGE
pvc-dda71d25-95a4-4ed1-8b49-10bf156ec294  10Gi      RWO          Retain      Available  pushat/payalsc1  payalsc1  7m7s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  37m
payalsc1     kubernetes.io/aws-ebs  7m8s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>
```

Also create sc and pvc file using kubectl cluster -f sc.yaml and kubectl cluster -f pvc.yaml

```
C:\Administrator: Command Prompt
error: the path "pvc.yaml" does not exist
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc gp2
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  37m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f sc.yaml
error: the path "sc.yaml" does not exist

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f sc.yaml
storageclass.storage.k8s.io/payalsc1 created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f pvc.yaml
persistentvolumeclaim/payalsc1 created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  17m
payalsc1     kubernetes.io/aws-ebs  37m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>notepad sc.yaml
C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl create -f sc.yaml
storageclass.storage.k8s.io/payalsc1 created

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  37m
payalsc1     kubernetes.io/aws-ebs  37m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pvc
NAME          STATUS    VOLUME          CAPACITY   ACCESS MODES  STORAGECLASS   AGE
payalsc1      Bound    pvc-dda71d25-95a4-4ed1-8b49-10bf156ec294  10Gi      RWO          payalsc1       7m7s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get pv
NAME          CAPACITY   ACCESS MODES  RECLAIM POLICY  STATUS   CLAIM          BOUND   STORAGECLASS   REASON   AGE
pvc-dda71d25-95a4-4ed1-8b49-10bf156ec294  10Gi      RWO          Retain      Available  pushat/payalsc1  payalsc1  7m7s

C:\Users\Payal.Jajodia\Desktop\eks_class_code>kubectl get sc
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  37m
payalsc1     kubernetes.io/aws-ebs  37m

C:\Users\Payal.Jajodia\Desktop\eks_class_code>notepad sc.yaml
C:\Users\Payal.Jajodia\Desktop\eks_class_code>notepad sc.yaml
C:\Users\Payal.Jajodia\Desktop\eks_class_code>notepad pvc.yaml
C:\Users\Payal.Jajodia\Desktop\eks_class_code>
```

```

Administrator: Command Prompt
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get sc gp2
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  179m
C:\Users\Payal Jajodia\Desktop\eks_class_code>notepad sc.yaml
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl create -f sc1.yaml
storageclass.storage.k8s.io/payalsc1 created
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get sc1 gp2
error: the server doesn't have a resource type "sc1"
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get sc gp2
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  179m
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get pvc
NAME          STATUS   容量   CAPACITY  ACCESS MODES  STORAGECLASS  AGE
payalsc1      Bound  10Gi  10Gi  RWO        payalsc1       7m7s
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get pv
NAME          CAPACITY  ACCESS MODES  RECLAIM POLICY  STATUS  CLAIM  STORAGECLASS  REASON  AGE
pvc-daf1d105-95a4-4ed1-8b49-10f156e208  10Gi  RWO  Retain  Bound  pushali/payalsc1  payalsc1  7m1s
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get sc
NAME        PROVISIONER   AGE
gp2 (default)  kubernetes.io/aws-ebs  317m
payalsc1     kubernetes.io/aws-ebs  200ms
payalc1     kubernetes.io/aws-ebs  7m8s
C:\Users\Payal Jajodia\Desktop\eks_class_code>notepad sc.yaml
C:\Users\Payal Jajodia\Desktop\eks_class_code>notepad sc1.yaml
C:\Users\Payal Jajodia\Desktop\eks_class_code>notepad pvc.yaml
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl describe sc payalsc1

Events:

C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get sc1 gp2
error: the server doesn't have a resource type "sc1"
C:\Users\Payal Jajodia\Desktop\eks_class_code>

```

Now get all the node groups and also scale them . Use the command eksctl get nodegroup –cluster <name of cluster>

```

Administrator: Command Prompt
C:\WINDOWS\system32>aws configure
AWS Access Key ID [*****]: AKIA5XGPOLY5QFN3O
AWS Secret Access Key [*****]: tHGYNaW2Bjv9z1z0+BxSPZ6U/pzzSmIA1AWoEe
Default region name [ap-south-1]: ap-south-1
Default output format [json]: json
C:\WINDOWS\system32>cd ..
C:\>cd users\paypal jajodia\desktop
C:\Users\Payal Jajodia\Desktop>eksctl get cluster
'eks' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\Payal Jajodia\Desktop>eksctl get cluster
NAME      REGION
payalcluster  ap-south-1
C:\Users\Payal Jajodia\Desktop>eksctl get nodegroup --cluster payalcluster
CLUSTER  NODEGROUP  CREATED      MIN SIZE  MAX SIZE  DESIRED CAPACITY  INSTANCE TYPE  IMAGE ID
payalcluster  ng1  2020-07-07T06:17:43Z  2        2        2        t2.micro  ami-073969767527f7306
payalcluster  ng2  2020-07-07T06:17:43Z  1        1        1        t2.micro  ami-073969767527f7306
C:\Users\Payal Jajodia\Desktop>

```

Now scale the nodegroup using the command eksctl scale nodegroup –cluster <name of cluster> ng2 –nodes-max=5

```

Administrator: Command Prompt
C:\Users\Payal Jajodia\Desktop>eksctl get cluster
NAME      REGION
payalcluster  ap-south-1
C:\Users\Payal Jajodia\Desktop>eksctl get nodegroup --cluster payalcluster
CLUSTER  NODEGROUP  CREATED      MIN SIZE  MAX SIZE  DESIRED CAPACITY  INSTANCE TYPE  IMAGE ID
payalcluster  ng1  2020-07-07T06:17:43Z  2        2        2        t2.micro  ami-073969767527f7306
payalcluster  ng2  2020-07-07T06:17:43Z  1        1        1        t2.micro  ami-073969767527f7306
C:\Users\Payal Jajodia\Desktop>eksctl scale nodegroup --cluster payalcluster --name ng1 --nodes=3
[!] scaling nodegroup std::vector<std::string>: In cluster eksctl:payalcluster-cluster
Error: failed to scale nodegroup for cluster "payalcluster", error: the desired nodes 3 is greater than current nodes/maxSize 1
C:\Users\Payal Jajodia\Desktop>eksctl get nodegroup --cluster payalcluster
CLUSTER  NODEGROUP  CREATED      MIN SIZE  MAX SIZE  DESIRED CAPACITY  INSTANCE TYPE  IMAGE ID
payalcluster  ng1  2020-07-07T06:17:43Z  2        2        2        t2.micro  ami-073969767527f7306
payalcluster  ng2  2020-07-07T06:17:43Z  1        1        1        t2.micro  ami-073969767527f7306
C:\Users\Payal Jajodia\Desktop>eksctl scale nodegroup --cluster payalcluster --name ng2 --nodes=3 --nodes-max=5
[!] scaling nodegroup std::vector<std::string>: In cluster eksctl:payalcluster-cluster
[!] scaling nodegroup, desired capacity from 1 to 3, max size from 1 to 5
C:\Users\Payal Jajodia\Desktop>eksctl scale nodegroup --cluster payalcluster --name ng2 --nodes=3 --nodes-max=5
[!] scaling nodegroup std::vector<std::string>: In cluster eksctl:payalcluster-cluster
[!] no change for nodegroup "ng1" in cluster "eksctl:payalcluster-cluster": nodes-min 1, desired 3, nodes-max 5
C:\Users\Payal Jajodia\Desktop>

```

Now go to one of your node group and run your namespace using the command ssh -l keyname ec2-user -i <ip>

For checking how many pods are running in the namespace use the command `kube-system`

```
Administrator Command Prompt
Available program or batch file.

C:\Users\Payal.Jajodia\Desktop>kubectl get cluster
NAME          REGION
payallcluster  ap-south-1

C:\Users\Payal.Jajodia\Desktop>kubectl get nodegroup --cluster payallcluster
CLUSTER      NODEGROUP   CREATED      MIN SIZE   MAX SIZE   DESIRED CAPACITY   INSTANCE TYPE   IMAGE ID
payallcluster ngt        2020-07-07T06:17:43Z   2           2           2           t2.micro     ami-07369762f527f7306
payallcluster ng2        2020-07-07T06:17:43Z   1           1           1           t2.micro     ami-07369762f527f7306

C:\Users\Payal.Jajodia\Desktop>kubectl scale nodegroup --cluster payallcluster --name ngt --nodes=3
error: failed to scale nodegroup "ngt" in cluster "ekctl-payallcluster-cluster"
[!] the desired nodes is greater than current nodes-max/maxSize
error: failed to scale nodegroup for cluster "payallcluster", error: the desired nodes 3 is greater than current nodes-max/maxSize

C:\Users\Payal.Jajodia\Desktop>kubectl get nodegroup --cluster payallcluster
CLUSTER      NODEGROUP   CREATED      MIN SIZE   MAX SIZE   DESIRED CAPACITY   INSTANCE TYPE   IMAGE ID
payallcluster ngt        2020-07-07T06:17:43Z   2           2           3           t2.micro     ami-07369762f527f7306
payallcluster ng2        2020-07-07T06:17:43Z   1           1           1           t2.micro     ami-07369762f527f7306

C:\Users\Payal.Jajodia\Desktop>kubectl scale nodegroup --cluster payallcluster --name ngt --nodes=max5
[!] scaling nodegroup "ekctl-payallcluster-nodegroup-ngt" in cluster "ekctl-payallcluster-cluster"
[!] scaling nodegroup, desired capacity from 1 to 3, max size from 1 to 5
error: failed to scale nodegroup for cluster "payallcluster", error: the desired nodes 5 is greater than current nodes-max/maxSize

C:\Users\Payal.Jajodia\Desktop>kubectl scale nodegroup --cluster payallcluster --name ng2 --nodes=3 --nodes=max5
[!] scaling nodegroup "ekctl-payallcluster-nodegroup-ng2" in cluster "ekctl-payallcluster-cluster"
[!] scaling nodegroup, desired capacity from 1 to 1, max size from 1 to 5
error: failed to scale nodegroup for cluster "payallcluster", error: the desired nodes 3 is greater than current nodes-max/maxSize

C:\Users\Payal.Jajodia\Desktop>eks_class_code

C:\Users\Payal.Jajodia\Desktop>eks class_code kubectl get pods -n kube-system
NAME          READY STATUS RESTARTS AGE
kube-avx2    1/1 Running 0 17m
aws-node-86c6n 1/1 Running 0 167m
aws-node-99n4l 1/1 Running 0 164m
aws-node-99p3r 1/1 Running 0 166m
aws-node-q2dd2 1/1 Running 0 13m
Coredns-485d7998bd-94jzh 1/1 Running 0 1658m
kube-proxy-85zqk 1/1 Running 0 12m
kube-proxy-bpxv2 1/1 Running 0 1648m
kube-proxy-ctzcr 1/1 Running 0 13m
kube-proxy-tgk4x 1/1 Running 0 166m
kube-proxy-uml86 1/1 Running 0 167m

C:\Users\Payal.Jajodia\Desktop>
```

Now we will create Wordpress and MySql Multitier architecture on the top of EKS with the help of kustomization.yaml file using the command `kubectl create -k`.

```

Administrator: Command Prompt
C:\Users\Payal Jajodia\Desktop\eks_class_code>kubectl get pods -n kube-system -o wide
NAME          READY   STATUS    RESTARTS   AGE   IP           NOMINATED NODE   READINESS GATES
coredns       1/1     Running   0          16m   192.168.6.79   ip-192-168-6-79.ap-south-1.compute.internal   <none>
coredns       1/1     Running   0          16m   192.168.23.52  ip-192-168-23-52.ap-south-1.compute.internal   <none>
etcd-node-96c6n  1/1     Running   0          16m   192.168.71.70  ip-192-168-71-70.ap-south-1.compute.internal   <none>
etcd-node-19645  1/1     Running   0          16m   192.168.9.64   ip-192-168-9-64.ap-south-1.compute.internal   <none>
etcd-node-942d2  1/1     Running   0          14m   192.168.8.83   ip-192-168-8-83.ap-south-1.compute.internal   <none>
coredns       1/1     Running   0          16m   192.168.28.19  ip-192-168-9-41.ap-south-1.compute.internal   <none>
coredns       1/1     Running   0          16m   192.168.24.27  ip-192-168-9-41.ap-south-1.compute.internal   <none>
coredns       1/1     Running   0          16m   192.168.98.83  ip-192-168-9-41.ap-south-1.compute.internal   <none>
kube-proxy-wml86 1/1     Running   0          16m   192.168.23.52  ip-192-168-23-52.ap-south-1.compute.internal   <none>
kube-proxy-wml86 1/1     Running   0          16m   192.168.23.52  ip-192-168-23-52.ap-south-1.compute.internal   <none>

C:\Users\Payal Jajodia\Desktop\eks_class_code>cd ..
C:\Users\Payal Jajodia\Desktop>kubectl create -k
error: flag needs an argument: 'k' in '-k'
See 'kubectl create --help' for usage.

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl create -k
error: unable to file one of 'kustomization.yaml', 'kustomization.yml' or 'Kustomization' in directory 'C:\Users\Payal Jajodia\Desktop\kube_cloud'
error: unable to file one of 'kustomization.yaml', 'kustomization.yml' or 'Kustomization' in directory 'C:\Users\Payal Jajodia\Desktop\kube_cloud'

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl create -k
secret/mysql-pass-ctm2f4889c created
service/wordpress-mysql created
deployment.apps/wordpress created
persistentvolumeclaim/mysql-pv-claim created
persistentvolumeclaim/wp-pv-claim created

C:\Users\Payal Jajodia\Desktop\kube_cloud>
```

Now get the pods and the pv using following commands as mentioned inn screenshot.

```

Administrator: Command Prompt
C:\Users\Payal Jajodia\Desktop>mkdir kube_cloud
C:\Users\Payal Jajodia\Desktop>cd kube_cloud
C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl create -k
Error: flag needs an argument: 'k' in '-k'
see 'kubectl create --help' for usage.

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl create -k
error: unable to find one of 'kustomization.yaml', 'kustomization.yml' or 'Kustomization' in directory 't:\Users\Payal Jajodia\Desktop\kube_cloud'
error: unable to find one of 'kustomization.yaml', 'kustomization.yml' or 'Kustomization' in directory 'C:\Users\Payal Jajodia\Desktop\kube_cloud'

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl create -k
secret/mysql-pass-ctm2f4889c created
service/wordpress-mysql created
deployment.apps/wordpress created
deployment.apps/wordpress-mysql created
persistentvolumeclaim/mysql-pv-claim created
persistentvolumeclaim/wp-pv-claim created

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE   IP           NOMINATED NODE   READINESS GATES
wordpress-88ch8hb9b-8cc6w 1/1     Running   0          2m51s
wordpress-mysql-66b4c9ccb-d2bb3 1/1     Running   0          2m51s

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl get secret
NAME          TYPE        DATA   AGE
default-token-76kkp  kubernetes.io/service-account-token  3    7h46m
mysql-pass-ctm2f4889c  Opaque      1    3m5s

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl get pvc
NAME          CAPACITY   VOLUME   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM   STORAGECLASS   REASON   AGE
mysql-pv-claim  20Gi      pvc-e996ec5c-60fc-4e90-bf05-ddff449bf48c  RWO      Delete   Bound   default/wp-pv-Claim  gp2      3m28s
wp-pv-claim    20Gi      pvc-6932e270-69a5-4e0b-91e4-00857dbf23a  RWO      Retain   Bound   pushshift/payalsci  payalsci  4h47m
pvc-9996ec5c-60fc-4e90-bf05-ddff449bf48c  20Gi      RWO      Delete   Bound   default/mysql-pv-claim  gp2      3m28s

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl get pv
NAME          CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM   STORAGECLASS   REASON   AGE
pvc-6922e7b-09af-40eb-91e4-0b057df2f33a  20Gi      RWO      Delete   Bound   default/wp-pv-Claim  gp2      3m28s
pvc-4dd71d25-95a4-4e01-8d40-10bf156ec294  10Gi     RWO      Retain   Bound   pushshift/payalsci  payalsci  4h47m
pvc-e996ec5c-60fc-4e90-bf05-ddff449bf48c  20Gi      RWO      Delete   Bound   default/mysql-pv-claim  gp2      3m28s

C:\Users\Payal Jajodia\Desktop>kube_cloud\kubectl get pv
NAME          CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM   STORAGECLASS   REASON   AGE
pvc-6922e7b-09af-40eb-91e4-0b057df2f33a  20Gi      RWO      Delete   Bound   default/wp-pv-Claim  gp2      5m7s
pvc-4dd71d25-95a4-4e01-8d40-10bf156ec294  10Gi     RWO      Retain   Bound   pushshift/payalsci  payalsci  4h49m
pvc-e996ec5c-60fc-4e90-bf05-ddff449bf48c  20Gi      RWO      Delete   Bound   default/mysql-pv-claim  gp2      5m7s

C:\Users\Payal Jajodia\Desktop>
```

Now we can see that complete multtier architecture is deployed with the wordpress and mysql pods, services, load balancers.

Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Don't worry, you can always change these settings later.

Site Title: payal12

Username: payal24

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password: [REDACTED]

Medium

Important: You will need this password to log in. Please store it in a secure location.

Your Email: payaljajodia48@gmail.com

Double-check your email address before continuing.

Search Engine Visibility: Discourage search engines from indexing this site
It is up to search engines to honor the request.

Install WordPress

Go to your console and create a EFS as mentioned below in the screenshot.
Also configure your ekscluster NodeGroup with the inbound rules.

Step 1: Configure network access

Step 2: Configure file system settings

Step 4: Review and create

The screenshots show the configuration of three mount targets across three subnets in a VPC:

VPC	Availability Zone	Subnet	IP address	Security groups
ap-south-1	ap-south-1a	subnet-01a7afa69690a22b7 - eksctl-payalcluster-cluster/SubnetPublicAPSOUTH1A	Automatic	sg-0005691c17f82723 - eksctl-payalcluster-cluster-ClusterSharedNodeSecurityGroup-ZUSKMIVYMU7
ap-south-1	ap-south-1b	subnet-042092986570f173a - eksctl-payalcluster-cluster/SubnetPublicAPSOUTH1B	Automatic	sg-0005691c17f82723 - eksctl-payalcluster-cluster-ClusterSharedNodeSecurityGroup-ZUSKMIVYMU7
ap-south-1	ap-south-1c	subnet-009a96444a4acbc3 - eksctl-payalcluster-cluster/SubnetPublicAPSOUTH1C	Automatic	sg-0005691c17f82723 - eksctl-payalcluster-cluster-ClusterSharedNodeSecurityGroup-ZUSKMIVYMU7

This will successfully creates EFS

The screenshot shows the AWS EFS service dashboard with the following details:

- Name:** fs-tlSee5ce
- Metered size:** 6.0 KB
- Number of mount targets:** 3
- Creation date:** 07/07/2020, 14:13:44 UTC
- File system access:** Manage network access, Manage client access

Now we will use HELM for installing the packages for installing the HELM using command helm init and set repo for that and update that.

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm init
Creating C:\Users\Payal.Jajodia.helm
Creating C:\Users\Payal.Jajodia.helm\repository
Creating C:\Users\Payal.Jajodia.helm\repository\cache
Creating C:\Users\Payal.Jajodia.helm\repository\local
Creating C:\Users\Payal.Jajodia.helm\plugins
Creating C:\Users\Payal.Jajodia.helm\starters
Creating C:\Users\Payal.Jajodia.helm\tiller\archive
Creating C:\Users\Payal.Jajodia.helm\repository\repositories.yaml
Adding stable repo with URL: https://kubernetes-charts.storage.googleapis.com
Adding local repo with URL: http://127.0.0.1:8879/charts
tiller_helm has been configured at c:\users\payal.jajodia\helm.

Tiller (the Helm server-side component) has been installed into your Kubernetes cluster.

Please note: by default, Tiller is deployed with an insecure 'allow unauthenticated users' policy.
To prevent this, run 'helm init' with the --tiller-tls-verify flag.
For more information on securing your installation see: https://v2.helm.sh/docs/securing_installation/

C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm init
HELM_HOME has been configured at C:\Users\Payal.Jajodia.helm.
Warning: Tiller is already installed in the cluster.
(use --client-only to suppress this message, or --upgrade to upgrade Tiller to the current version.)

C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm repo add stable https://kubernetes-charts.storage.googleapis.com
"stable" has been added to your repositories

C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm repo list
NAME URL
stable https://kubernetes-charts.storage.googleapis.com
local http://127.0.0.1:8879/charts
C:\Users\Payal.Jajodia\Desktop\kube_cloud>

```

Now we will install triller it is a server side component of helm

```

Administrator: Command Prompt
stable/zetcd          0.1.3      0.0.3      CoreOS zetcd Helm chart For Kubernetes
stable/zetcd          0.1.2      0.0.3      CoreOS zetcd Helm chart For Kubernetes
stable/zetcd          0.1.0      0.0.3      CoreOS zetcd Helm chart For Kubernetes

C:\Users\Payal.Jajodia\Desktop\kube_cloud>clear
"clear" is not recognizing an internal or external command,
or a readable program or batch file.

C:\Users\Payal.Jajodia\Desktop\kube_cloud>helm install --name my-release stable/jenkins
Error: release my-release failed: namespaces "default" User "system:serviceaccount:kube-system:default" cannot get resource "namespaces" in API group "" in the namespace "default"

C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install --name my-release stable/jenkins
Error: release my-release failed: namespaces "default" User "system:serviceaccount:kube-system:default" cannot get resource "namespaces" in API group "" in the namespace "default"

C:\Users\Payal.Jajodia\Desktop\kubekubectl get pods -n kube-system
NAME           READY   STATUS    RESTARTS   AGE
aws-node-4cvsm 1/1    Running   0          137m
aws-node-86c6n  1/1    Running   0          4h52m
aws-node-9414l  1/1    Running   0          4h50m
aws-node-199rs  1/1    Running   0          4h51m
aws-node-d2ddz  1/1    Running   0          138m
coredns-6856799bbd-94j2h 1/1    Running   0          4h50m
coredns-6856799bbd-d9dpb 1/1    Running   0          4h50m
kube-proxy-5hsqf 1/1    Running   0          4h49m
kube-proxy-przv2 1/1    Running   0          4h49m
kube-proxy-sz6r  1/1    Running   0          138m
kube-proxy-tq4x  1/1    Running   0          4h51m
tiller-deploy-186 1/1    Running   0          4h52m
tiller-deploy-6974685d9c-shqz 1/1    Running   0          6m29s

C:\Users\Payal.Jajodia\Desktop\kube_cloud\kubekubectl get pods -n kube-system create serviceaccount tiller
Error from server: pods "create" not found
Error from server (NotFound): pods "serviceaccount" not found
Error from server (NotFound): pods "tiller" not found

C:\Users\Payal.Jajodia\Desktop\kube_cloud\kubekubectl -n kube-system create serviceaccount tiller
serviceaccount/tiller created

C:\Users\Payal.Jajodia\Desktop\kube_cloud\kubekubectl create clusterrolebinding tiller --clusterrole cluster-admin --serviceaccount=kube-system:tiller
clusterrolebinding.rbs.authorization.k8s.io/tiller created

C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm init --service-account tiller-upgrade
HELM_HOME has been configured at C:\Users\Payal.Jajodia.helm.

Warning: Tiller is already installed in the cluster.
(use --client-only to suppress this message, or --upgrade to upgrade Tiller to the current version.)

C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm init --service-account tiller --upgrade
HELM_HOME has been configured at C:\Users\Payal.Jajodia.helm.

Tiller (the Helm server-side component) has been updated to gcr.io/kubernetes-helm/tiller:v2.16.9 .

C:\Users\Payal.Jajodia\Desktop\kube_cloud>

```

Installing Prometheus and Grafana

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\kube_cloud>kubectl create namespace prometheus
namespace/prometheus created

C:\Users\Payal.Jajodia\Desktop\kube_cloud>helm install stable/prometheus --namespace prometheus --set alertmanager.persistentVolume.storageClass="gp2" --set server.persistentVolume.storageClass="gp2"
"stable-prometheus" created
LAST DEPLOYED: Tue Jul 7 20:28:40 2020
NAMESPACE: prometheus
STATUS: DEPLOYED

RESOURCES:
--> v1/ConfigMap
  NAME                DATA AGE
  invincible-jackal-prometheus-alertmanager 1  1s
  invincible-jackal-prometheus-server       5  1s

--> v1/DaemonSet
  NAME            DESIRED CURRENT READY UP-TO-DATE AVAILABLE NODE SELECTOR AGE
  invincible-jackal-prometheus-node-exporter 4     4     0     4     0     <none>   0s

--> v1/Deployment
  NAME                READY UP-TO-DATE AVAILABLE AGE
  invincible-jackal-kube-state-metrics 0/1  0/1  0     0s
  invincible-jackal-prometheus-alertmanager @/1  1     0     0s
  invincible-jackal-prometheus-pushgateway @/1  1     0     0s
  invincible-jackal-prometheus-server     @/1  1     0     0s

--> v1/PersistentVolumeClaim
  NAME                STATUS VOLUME CAPACITY ACCESS MODES STORAGECLASS AGE
  invincible-jackal-prometheus-alertmanager pending gp2  0s
  invincible-jackal-prometheus-server     pending gp2  1s

--> v1/Pod(scheduled)
  NAME                READY STATUS RESTARTS AGE
  invincible-jackal-kube-state-metrics-7844ad9c9db-vrd6h 0/1 Pending 0  0s
  invincible-jackal-prometheus-alertmanager-56d4f95446-rkm47 0/2 Pending 0  0s
  invincible-jackal-prometheus-pushgateway-5876998eb-fjzos 0/1 Pending 0  0s
  invincible-jackal-prometheus-node-exporter-melk7 0/1 Pending 0  0s
  invincible-jackal-prometheus-node-exporter-q4kv 0/1 Pending 0  0s
  invincible-jackal-prometheus-server-598cb0758-p2fzh 0/2 Pending 0  0s

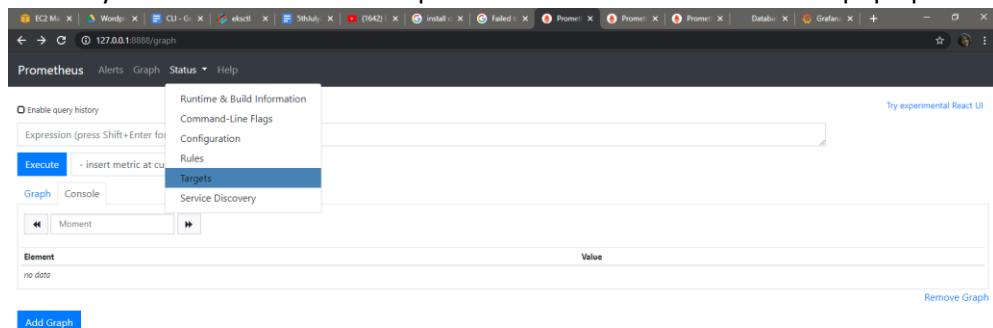
--> v1/Service
  NAME                TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
  invincible-jackal-kube-state-metrics ClusterIP <none> 8080/TCP 0s
  invincible-jackal-prometheus-alertmanager ClusterIP 10.100.236.187 <none> 8080/TCP 0s
  invincible-jackal-prometheus-pushgateway ClusterIP 10.100.156.173 <none> 9100/TCP 0s
  invincible-jackal-prometheus-node-exporter ClusterIP None 8080/TCP 0s
  invincible-jackal-prometheus-server ClusterIP 10.100.177.129 <none> 80/TCP 0s
  invincible-jackal-prometheus-server ClusterIP 10.100.93.156 <none> 80/TCP 0s

C:\Users\Payal.Jajodia\Desktop\kube_cloud>

```

This is the complete installation of Prometheus

Now any one can use 127.0.0.1 at port 8888 and below screen will be pop up.



Now install Grafana

```

Administrator: Command Prompt
invincible-jackal-prometheus-server ClusterIP 10.100.93.156 <none> 80/TCP 17m
C:\Users\Payal.Jajodia\Desktop\kube_cloud\kubectl -n prometheus port-forward svc/independent-beetle-prometheus-server 8088:80
Error from server: (NotFound): services "independent-beetle-prometheus-server" not found
C:\Users\Payal.Jajodia\Desktop\kube_cloud\kubectl -n prometheus port-forward svc/youthful-antelope-prometheus-server 8088:80
Error from server: (NotFound): services "youthful-antelope-prometheus-server" not found
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install --name my-release stable/prometheus
Error: a release named my-release already exists.
Run: helm ls --all my-release; to check the status of the release
Or run: helm del --purge my-release; to delete it
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install --name my-release stable/grafana
Error: a release named my-release already exists.
Run: helm ls --all my-release; to check the status of the release
Or run: helm del --purge my-release; to delete it
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install --name my-release stable/prometheus
NAME: my-release
my-release-prometheus-alertmanager 1 1s
my-release-prometheus-server 5 1s
STATUS: DEPLOYED
RESOURCES:
--> V1/ConfigMap
NAME          DATA AGE
my-release1-prometheus-alertmanager 1 1s
my-release1-prometheus-server 5 1s
--> V1/DaemonSet
NAME          DESIRED CURRENT READY UP-TO-DATE AVAILABLE NODE SELECTOR AGE
my-release1-prometheus-node-exporter 4 4 4 4 4 4 <none> 1s
--> V1/Deployment
NAME          READY UP-TO-DATE AVAILABLE AGE
my-release1-kube-state-metrics 0/1 1 0 1s
my-release1-prometheus-alertmanager 0/1 1 0 1s
my-release1-prometheus-pushgateway 0/1 1 0 1s
my-release1-prometheus-server 0/1 1 0 1s
--> V1/PersistentVolumeClaim
NAME          STATUS VOLUME CAPACITY ACCESS MODES STORAGECLASS AGE
my-release1-prometheus-alertmanager Pending gp2 1s
my-release1-prometheus-server Pending gp2 1s
--> V1/Pod(related)
NAME          READY STATUS RESTARTS AGE
my-release1-kube-state-metrics-55cc55dc-dtpqm 0/1 Pending 0 1s
my-release1-prometheus-alertmanager-567f58fc47-xujq9 0/2 Pending 0 1s
--> V1/Service
NAME          TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
my-release1-prometheus-server LoadBalancer 10.100.93.156 80:31285/TCP 17m
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install stable/grafana --namespace grafana --set persistent.storageClassName="gp2" --set adminPassword='redhat' --set service.type=LoadBalancer
NAME: edgy-neut
LAST DEPLOYED: Tue Jul 7 20:55:24 2020
NAMESPACE: grafana
STATUS: DEPLOYED
RESOURCES:
--> V1/ClusterRole
NAME          DATA AGE
edgy-neut-grafana-clusterrole 0s
--> V1/ClusterRoleBinding
NAME          AGE
edgy-neut-grafana-clusterrolebinding 0s
--> V1/ConfigMap
NAME          DATA AGE
edgy-neut-grafana 1 0s
edgy-neut-grafana-test 1 0s
--> V1/Deployment
NAME          READY UP-TO-DATE AVAILABLE AGE
edgy-neut-grafana 0/1 1 0 0s
--> V1/Pod(related)
NAME          READY STATUS RESTARTS AGE
edgy-neut-grafana-86485c6c8-d2vv2 0/1 Pending 0 0s
--> V1/Role
NAME          AGE
edgy-neut-grafana-test 0s
--> V1/RoleBinding
NAME          AGE
edgy-neut-grafana-test 0s
--> V1/Secret
NAME          TYPE DATA AGE
edgy-neut-grafana Opaque 3 0s
--> V1/Service
NAME          TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
edgy-neut-grafana LoadBalancer 10.100.23.99 <pending> 80:31285/TCP 0s

```

Now this will install grafan

```

Administrator: Command Prompt
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install stable/grafana --namespace grafana --set persistent.storageClassName="gp2" --set adminPassword='redhat' --set service.type=LoadBalancer
NAME: edgy-neut
LAST DEPLOYED: Tue Jul 7 20:55:24 2020
NAMESPACE: grafana
STATUS: DEPLOYED
RESOURCES:
--> V1/ClusterRole
NAME          DATA AGE
edgy-neut-grafana-clusterrole 0s
--> V1/ClusterRoleBinding
NAME          AGE
edgy-neut-grafana-clusterrolebinding 0s
--> V1/ConfigMap
NAME          DATA AGE
edgy-neut-grafana 1 0s
edgy-neut-grafana-test 1 0s
--> V1/Deployment
NAME          READY UP-TO-DATE AVAILABLE AGE
edgy-neut-grafana 0/1 1 0 0s
--> V1/Pod(related)
NAME          READY STATUS RESTARTS AGE
edgy-neut-grafana-86485c6c8-d2vv2 0/1 Pending 0 0s
--> V1/Role
NAME          AGE
edgy-neut-grafana-test 0s
--> V1/RoleBinding
NAME          AGE
edgy-neut-grafana-test 0s
--> V1/Secret
NAME          TYPE DATA AGE
edgy-neut-grafana Opaque 3 0s
--> V1/Service
NAME          TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
edgy-neut-grafana LoadBalancer 10.100.23.99 <pending> 80:31285/TCP 0s

```

```

Administrator: Command Prompt
#####
(e.g., .Values.nodeExporter.podSecurityPolicy.annotations) #####
#####
The Prometheus PushGateway can be accessed via port 9091 on the following DNS name from within your cluster:
my-release1-prometheus-pushgateway.default.svc.cluster.local

Get the PushGateway URL by running these commands in the same shell:
  export POD_NAME=$(kubectl get pods --namespace default -l "app=prometheus,component=pushgateway" -o jsonpath="{.items[0].metadata.name}")
  kubectl --namespace default port-forward $POD_NAME 9091
For more information on running Prometheus, visit:
  https://prometheus.io/
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install --name my-release1 stable/prometheus
Error: a release named my-release1 already exists.
Run: helm ls -all my-release1; to check the status of the release
Or run: helm del --purge my-release1; to delete it
C:\Users\Payal.Jajodia\Desktop\kube_cloud\helm install --name my-release2 stable/grafana
NAME: my-release2
LAST DEPLOYED: Tue Jul 7 20:51:02 2020
NAMESPACE: default
STATUS: DEPLOYED

RESOURCES:
--> v1/ClusterRole
  NAME                AGE
  my-release2-grafana   0s

--> v1/ClusterRoleBinding
  NAME                AGE
  my-release2-grafana-clusterrolebinding   0s

--> v1/ConfigMap
  NAME          DATA AGE
  my-release2-grafana     1   0s
  my-release2-grafana-test 1   0s

--> v1/Deployment
  NAME        READY  UP-TO-DATE AVAILABLE AGE
  my-release2-grafana  0/1    1           0s

--> v1/Pod(related)
  NAME        READY  STATUS RESTARTS AGE
  my-release2-grafana-test  0/1    Running 0          0s

C:\Administrator: Command Prompt
NAME          AGE
my-release2-grafana-test  0s

--> v1/Secret
  NAME          TYPE  DATA AGE
  my-release2-grafana Opaque  3   0s

--> v1/Service
  NAME          TYPE      CLUSTER-IP      EXTERNAL-IP PORT(S) AGE
  my-release2-grafana ClusterIP 10.100.105.161 <none>  80/TCP  0s

--> v1/ServiceAccount
  NAME          SECRETS AGE
  my-release2-grafana     1   0s
  my-release2-grafana-test 1   0s

--> v1beta1/podSecurityPolicy
  NAME          PRIV  GOPS  SELinux  RUNASUSER FGROUP  SGROUP  READONLYROOTFS VOLUMES
  my-release2-grafana-test  false  RunAsAny  RunAsAny  RunAsAny  RunAsAny  RunAsAny  false  configMap,emptyDir,projected,secret,downwardAPI,persistentVolumeClaim

--> v1beta1/Role
  NAME                AGE
  my-release2-grafana   0s

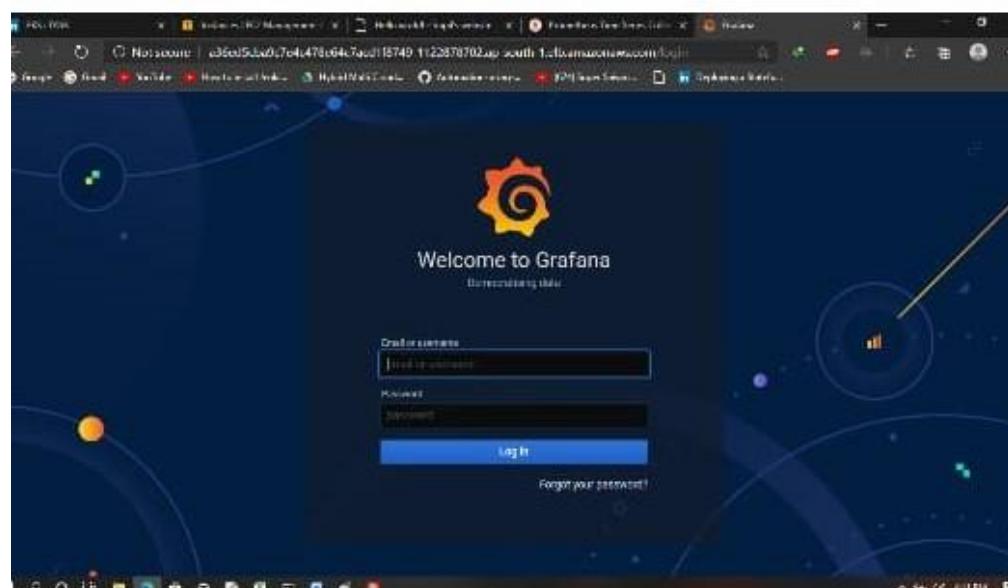
--> v1beta1/RoleBinding
  NAME                AGE
  my-release2-grafana   0s

NOTES:
1. Get your 'admin' user password by running:
  kubectl get secret --namespace default my-release2-grafana -o jsonpath='{.data.admin-password}' | base64 --decode ; echo
2. The Grafana server can be accessed via port 80 on the following DNS name from within your cluster:
  my-release2-grafana.default.svc.cluster.local
  Get the Grafana URL to visit by running these commands in the same shell:
  export POD_NAME=$(kubectl get pods --namespace default -l "app.kubernetes.io/name=grafana,app.kubernetes.io/instance=my-release2" -o jsonpath="{.items[0].metadata.name}")
  kubectl --namespace default port-forward $POD_NAME 3000
3. Login with the password from step 1 and the username: admin
#####
##### WARNING: Persistence is disabled!!! You will lose your data when #####
##### the Grafana pod is terminated. #####
#####

C:\Users\Payal.Jajodia\Desktop\kube_cloud>

```

Login to your Grafan



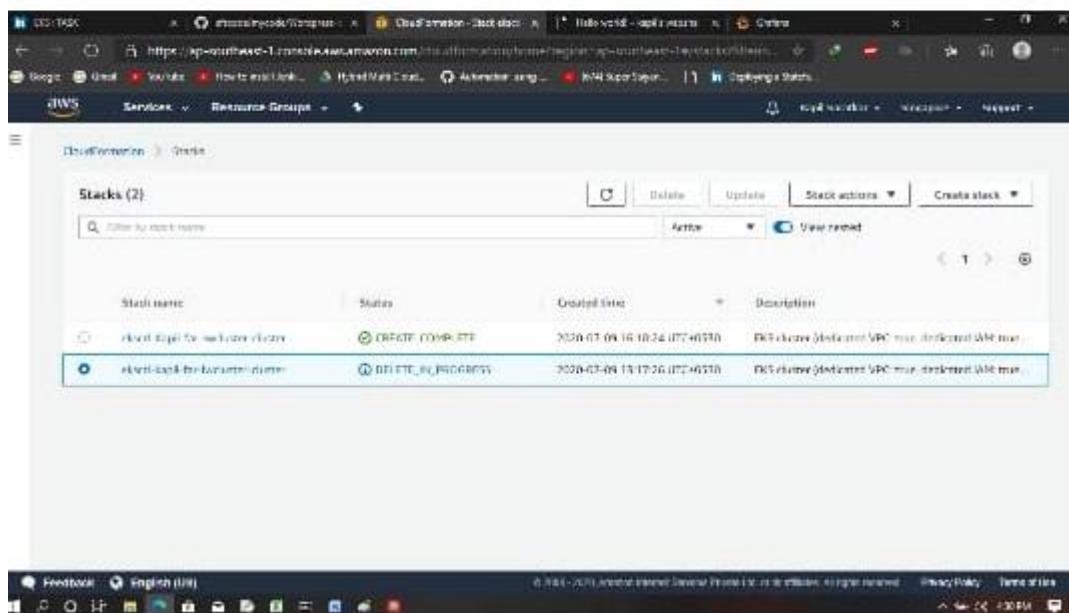
Now we will create a Fargate Cluster

AWS Fargate is a serverless compute engine for containers that works with both Amazon ECS and

Amazon EKS. Fargate makes it easy for you to focus on building your applications.

Use command create cluster -f clusterf.yml

```
C:\Windows\system32\cmd.exe - Run as administrator
clusterf.yml
aws ecr-public create-cluster --cluster-name "FargateCluster"
aws ecr version 0.21.0
using region ap-southeast-1
setting availability zones to [ap-southeast-1a ap-southeast-1b ap-southeast-1c]
subnets for ap-southeast-1a = public(10.100.0.0/19 private(192.168.0.0/19)
subnets for ap-southeast-1b = public(10.100.1.0/19 private(192.168.1.0/19)
subnets for ap-southeast-1c = public(10.100.2.0/19 private(192.168.2.0/19)
using Kubernetes version 1.18
creating ECR Cluster "FargateCluster" in "ap-southeast-1" region with Fargate profile
will create 3 CloudFormation stack for cluster itself and 6 managed nodegroup stacks
will create 3 CloudFormation stack for cluster itself and 6 managed nodegroup stacks
if you encounter any issues, check CloudFormation console or try "aws ecr-public describe-stacks --region=ap-southeast-1 --cluster=FargateCluster"
CloudWatch logging will not be enabled for cluster "FargateCluster" in "ap-southeast-1".
you can enable it with "aws ecr-public update-cluster-logging --region=ap-southeast-1 --cluster=FargateCluster"
Elasticache not endpoint access will be default (if "publicAccess=true, endpointAccess=false") for cluster "FargateCluster" in "ap-southeast-1"
2 suspended tasks[1 create cluster and 1 place "FargateCluster" in layer]
building cluster stack "eksctl FargateCluster cluster"
deploying stack "eksctl FargateCluster cluster"
```



This is the final screenshot of the fargate.

```
Administrator: ~\> eksctl --version
eksctl v0.24.0+1344.g1f3a2d1
Administrator: ~\> eksctl get cluster --region=us-east-1
NAME      REGION
fargate   us-east-1
Administrator: ~\> eksctl update-kubeconfig --name fargate --cluster
cd /Users/anthony/.kube/fargate
Administrator: ~\> kubectl get nodes
NAME           STATUS    ROLES   AGE   VERSION
ip-100-100-100-100-100-100-internal   Ready   master   2023-07-18T10:47:11Z
ip-100-100-100-100-100-100-internal   Ready   worker   2023-07-18T10:47:11Z
Administrator: ~\>
```

