Day#2 Summary : EKS

EKS is a fully managed service which is managed by AWS. It is highly integrated with AWS services such as EC2,EBS,ELB,EFS.

Spot Instances

We saw how to set up an eks cluster with a mix of spot instances & on demand instances . Spot instances (slaves nodes) are launched only when bid price is above the spot price. We can set the bid price for spot instances while launching it. The instances will be launched only when bid price is above the spot price. If the spot price is above bid price Spot instances will be terminated by AWS. There is a pricing associated with Spot instances.

Using eksctl we can create a single nodegroup with mixed instances such as t2.small, t2.micro etc.

Fargate

Fargate is a server-less architecture & it integrates with EKS. It's a black box which dynamically manages worker (slave) nodes without worrying about capacity such as RAM,CPU.It launches slaves at run time & manages internally. we can't see those slaves in the AWS console though.

CNI (Container Network Interface)

By default in a container there is no connectivity for pods running on multiple nodes. If there are multiple pods in a single slave node they can communicate with each other , however they can't connect with pods in another slave. Using CNI (also known as flannel) we can achieve this.
CNI, VPC, SUbnet created by Eksctl automatically once we set up the multinode cluster (1 master & 2 slaves)
k8s_coredns manages outside network connectivity.

Limit on no. of pods in a node

Following command shows maximum no. of pods which we can launch
ps aux | grep kubectl

The limit on no. of pods which can be launched in a node varies based on instance type.
e.g. for t2.micro instance it has capability of 4 NIC of which two are used for instance IP address - only two NIC are available and we can run only two pods in the t2.micro.
Network interface attached by aws cni for pods help in interconnection with other pods on different nodes.

Role

Role is used to give one AWS service power to another service.
e.g. Cloud formation can connect with VPC, EC2 & EBS services using a role. Client (kubectl) never used a role for cluster login.
When a client runs a pvc command , an EBS role is required.

for EFS service eksctl creates a role automatically.

Helm

Helm is a client side program that provides the k8s software packages where we can launch the whole application in the kubernetes cluster .

Tiller

Tiller is a server side program to help the helm to set up the whole infrastructure .
we saw how to install jenkins app in K8s cluster and use of prometheus & grafana .

Grafana is a visual dashboard for metrics.

EBS challenge

With EBS we can attach only one EBS volume at a time with the EC2 instance. EBS volume can't be used to connect to EC2 instance launched in different availability zones. This is a problem in a multi node cluster set up where multiple slave nodes can't be attached to centralised storage.

This can be resolved by using EFS service. EFS is a centralized NFS storage & it spans subnets in VPC. However, the Security group should be assigned to all the subsets while creating EFS . In EFS multiple nodes can concurrently access the storage without any performance/operational overhead.