EKS Cluster Setup

Topics Covered

1. Introduction to AWS EKS cluster
2. Benefits of AWS EKS cluster
3. Prerequisites to create EKS.
4. Different ways to setup EKS cluster.
   - AWS Management Console.
   - Infra Structure As A code(Terraform).
   - eksctl utility provided by AWS.
5. Step by step procedure to setup EKS Cluster using Console.
6. Deploy Demo Application.

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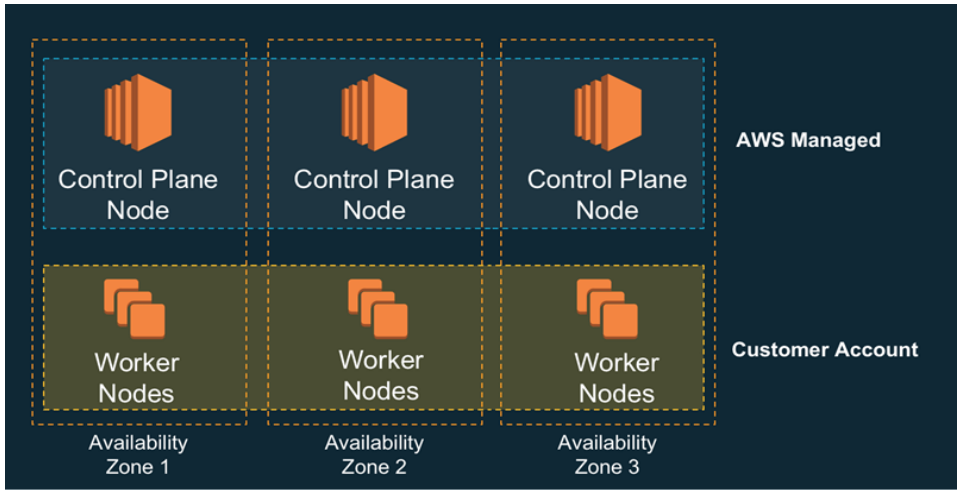
EKS Introduction

- Amazon Elastic Kubernetes Service (Amazon EKS) is a fully managed Kubernetes service.
- EKS is the best place to run Kubernetes applications because of its security, reliability, and scalability.
- EKS can be integrated with other AWS services such as ELB ,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.
- Makes it easy for you to run Kubernetes on AWS without needing to install, operate, and maintain your own Kubernetes control plane.

Managed control plane

Amazon EKS provides a scalable and highly-available control plane that runs across multiple AWS availability zones. The Amazon EKS service automatically manages the availability and scalability of the Kubernetes API servers and the etcd persistence layer for each cluster. Amazon EKS runs the Kubernetes control plane across three Availability Zones in order to ensure high availability, and it automatically detects and replaces unhealthy masters.



Prerequisites

- AWS Account With Admin Privileges.
- Instance to manage/access EKS cluster using kubectl.
- AWS CLI access to use kubectl utility.

Step By Step Procedure Using AWS Console

1. Create Dedicated VPC For EKS Cluster. When you create a cluster, the VPC that you specify must meet the following requirements and considerations:
   - The VPC must have a sufficient number of IP addresses available for the cluster, any nodes, and other Kubernetes resources that you want to create
   - The VPC must have DNS hostname and DNS resolution support. Otherwise, nodes can't register to your cluster.
   - This VPC has two public and two private subnets. A public subnet's associated route table has a route to an internet gateway. However, the route table of a private subnet doesn't have a route to an internet gateway. One public and one private subnet are deployed to the same Availability Zone. The other public and private subnets are deployed to a second Availability Zone in the same AWS Region. We recommend this option for most deployments.
   - With this option, you can deploy your nodes to private subnets. This option allows Kubernetes to deploy load balancers to the public subnets that can load balance traffic to pods that run on nodes in the private subnets. Public IPv4 addresses are automatically assigned to nodes that are deployed to public subnets, but public IPv4 addresses aren't assigned to nodes deployed to private subnets.

   https://s3.us-west-2.amazonaws.com/amazon-eks/cloudformation/2020-10-29/amazon-eks-vpc-private-subnets.yaml

1. Create IAM Role For EKS Cluster.
   - **EKS – Cluster**
2. Create EKS Cluster.
3. Create IAM Role For EKS Worker Nodes.
   - **AmazonEKSWorkerNodePolicy**
   - **AmazonEKS_CNI_Policy**
   - **AmazonEC2ContainerRegistryReadOnly**
   - **AmazonEBSCSIDriverPolicy**
4. Create Worker Nodes.

Step By Step Procedure Using AWS Console

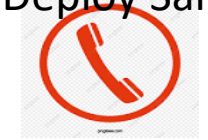
6. Create An Instance (If Not Exists) Install AWS CLI , IAM Authenticator And kubectl. Configure AWS CLI using Root or IAM User Access Key & Secret Key. Or Attach IAM With Required Policies. And get kubeconfig file.

   aws eks update-kubeconfig --name <ClusterName> --region <RegionName>

7. Deploy AWSEBSSCSI Driver Plugin.

   kubectl apply -k "github.com/kubernetes-sigs/aws-ebs-csi-driver/deploy/kubernetes/overlays/stable/?ref=release-1.25"

8. Deploy Sample Application.



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