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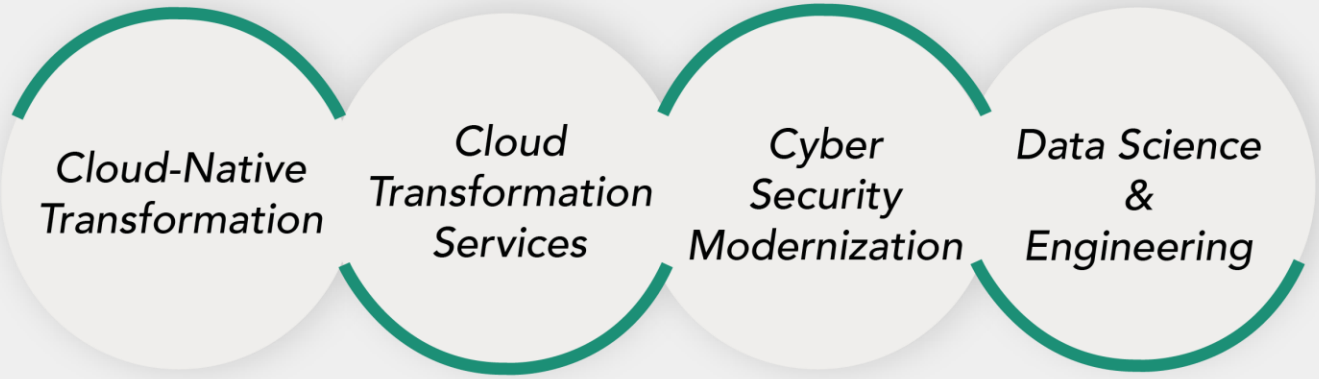
DELIVERING ON DIGITAL TRANSFORMATION & DISRUPTIVE TECHNOLOGIES

IN THE LAST
4 YEARS

We've helped our clients in their digital transformation journey with our expertise in disruptive technologies (Cloud, DevOps, Analytics) that ***enables agility, efficiency and faster time-to-value.***

A COMPLETE DIGITAL TRANSFORMATION EXPERIENCE



WEBINAR

AWS EKS
Elastic Kubernetes Services

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What is Amazon EKS?

- Managed Kubernetes Service from AWS
- Deploy, Scale and Manage containerized applications
- Launched in June 2018
- Ensuring High Availability

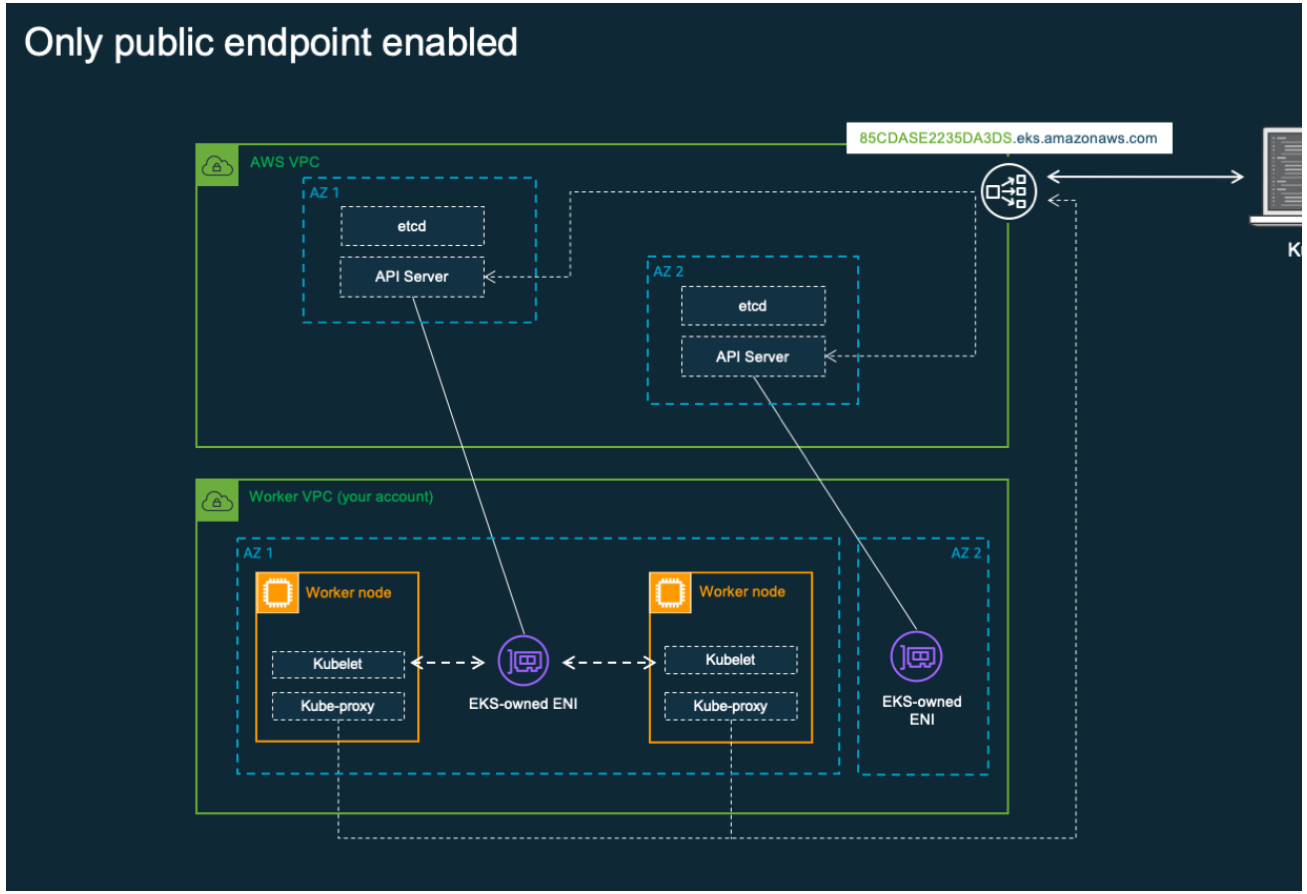
MANAGING CONTROL PLANES

- Detecting and replacing unhealthy control planes
- Automated version upgrades
- Automated patching of control planes

CONTROL PLANE ARCHITECTURE

Runs single tenant Kubernetes control plane for each cluster

Atleast 2 API server nodes and 2 etcd nodes in multi AZ



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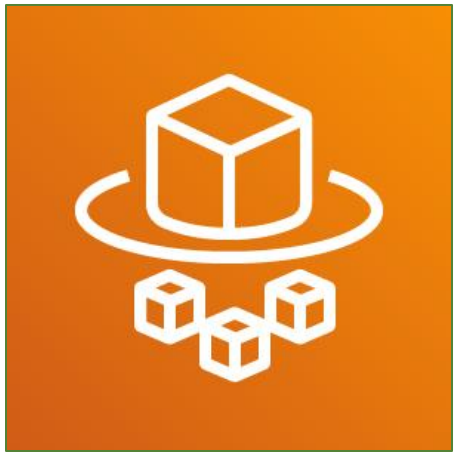
INTEGRATES WITH AWS SERVICES

IAM, Load balancers, VPC and DevOps specific services like ECR, CodeBuild, CodeCommit and CodeDeploy

MIGRATING TO EKS

- Easily migrate any Kubernetes standard applications to EKS
- Updating manifest files and deploying
- Identifying the right storage drivers

EKS, Fargate & ECS



FARGATE IF YOU WANT ABSTRACTION ON KUBERNETES CLUSTER. SERVERLESS COMPUTE ENGINE FOR KUBERNETES

ECS IS BASICALLY DOCKER AS A SERVICE WITHOUT ANY ORCHESTRATION ENGINE.

EKS IS FOR COMPLETE CONTROL ON CLUSTER WITH KUBERNETES AS ORCHESTRATOR

Features in EKS

- Autoscaling
- Pod Networking in EKS with CNI plugin
- ELB support (Classic, Application and Network)
- Nodegroups (managed and self-managed)
- Spot Instances and Spot Interrupt Handlers
- Support for persistent volumes

Eksctl cli tool for Creating clusters

```
eksctl create cluster
```

https://github.com/weaveworks/eksctl

eksctl create cluster -f cluster.yaml

```yaml
apiVersion: eksctl.io/v1alpha5
kind: ClusterConfig

metadata:
  name: basic-cluster
  region: eu-north-1

nodeGroups:
  - name: ng-1
    instanceType: m5.large
    desiredCapacity: 10
  - name: ng-2
    instanceType: m5.xlarge
    desiredCapacity: 2
```

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EKS MAKES KUBERNETES EASIER

Manage and operate Kubernetes with ease

Task	The Old Way	With EKS
Create a cluster	Provision network and VMs Install dozens of system components including etcd Create and install certificates Register agent nodes with control plane	`eksctl create cluster`
Upgrade a cluster	Upgrade your master nodes Cordon/drain and upgrade worker nodes individually	`eksctl upgrade cluster` `eksctl upgrade nodegroup`
Scale a cluster	Provision new VMs Install system components Register nodes with API server	`eksctl scale nodegroup`

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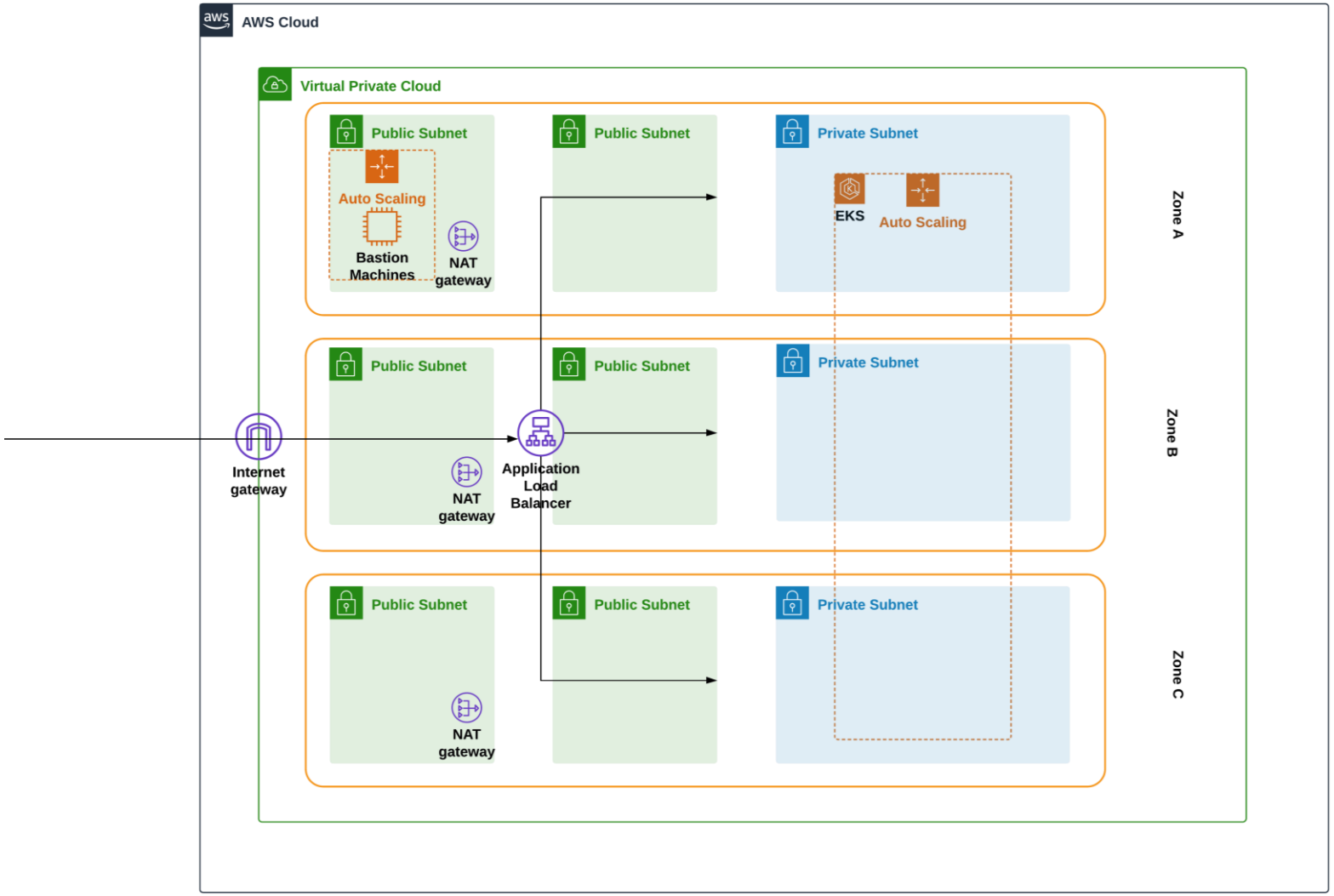
Eksctl commands

- $ eksctl create cluster –f cluster.yaml
- $ eksctl get clusters
- $ eksctl get nodegroups –-cluster eks-webinar-demo
- $ eksctl upgrade cluster eks-webinar-demo
- $ eksctl upgrade nodegroup ng-1 --cluster eks-webinar-demo
- $ eksctl scale ng ng-1 --cluster eks-webinar-demo --nodes=3 --nodes-min=2 --nodes-max=4
- $ eksctl delete cluster –f cluster.yaml

DEPLOYING A CLUSTER



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PRE-REQUISITES

- VPC
- 3 Private subnets for worker nodes
- 3 Public subnets for load balancers
- Nat gateway
- Internet gateway
- Tag load balancer subnets to denote ELB subnets

CREATING CLUSTER WITH Eksctl

```
fayad@adfolks:~/manifests$ cat eks-webinar/cluster.yaml
apiVersion: eksctl.io/v1alpha5
kind: ClusterConfig

metadata:
  name: eks-webinar-demo
  region: eu-central-1

vpc:
  subnets:
    private:
      eu-central-1a: { id: subnet-017082f2210038162 }
      eu-central-1b: { id: subnet-0ca47ca1609e78e4f }
      eu-central-1c: { id: subnet-008fec89791ce8d06 }

managedNodeGroups:
  - name: ng-1
    instanceType: t2.xlarge
    desiredCapacity: 2
    labels: { role: web, nodeSelector.lifecycle: OnDemand }
    minSize: 1
    maxSize: 4
    volumeSize: 50
    privateNetworking: true
    iam:
      withAddonPolicies:
        autoScaler: true
nodeGroups:
  - name: ng-2
    desiredCapacity: 2
    labels: { role: monitoring, nodeSelector.lifecycle: Ec2Spot }
    minSize: 1
    maxSize: 4
    volumeSize: 50
    privateNetworking: true
    instancesDistribution:
      maxPrice: 0.020
      instanceTypes: ["t2.small"]
      onDemandBaseCapacity: 0
      onDemandPercentageAboveBaseCapacity: 50
      spotAllocationStrategy: "capacity-optimized" # or lowest-price
    iam:
      withAddonPolicies:
        autoScaler: true
fayad@adfolks:~/manifests$
```

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CLUSTER MANAGEMENT

- Adding IAM user to cluster
- Apply cluster autoscaler
- Apply Spot Interrupt handlers

OBSERVABILITY IN EKS

- Eksctl commands
- Kubectl commands
- Observing autoscaling and nodegroup information from AWS console
- Enabling Cloudwatch logging for EKS

EKS best practices

- Deploy cluster on private subnets in multi AZ
- Create public subnets on each AZ for Load balancers
- Rely on nat gw for outbound
- Tag ELB subnets for EKS to identify loadbalancer subnets
- Define Cidr for pod networking in cluster yaml
- Deploy Autoscaler and Spot interrupt handler yaml
- Use service accounts for deploying applications

Useful resources

- https://www.eksworkshop.com/beginner/150_spotworkers/deployhandler/
- https://docs.aws.amazon.com/eks/latest/userguide/add-user-role.html
- https://docs.aws.amazon.com/eks/latest/userguide/cluster-autoscaler.html
- https://aws.amazon.com/ec2/spot/pricing/
- https://aws.amazon.com/blogs/containers/de-mystifying-cluster-networking-for-amazon-eks-worker-nodes/
- https://aws.amazon.com/ec2/pricing/on-demand/
- https://eksctl.io/usage/creating-and-managing-clusters/
- https://github.com/weaveworks/eksctl

Q&A

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Thank you!

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