

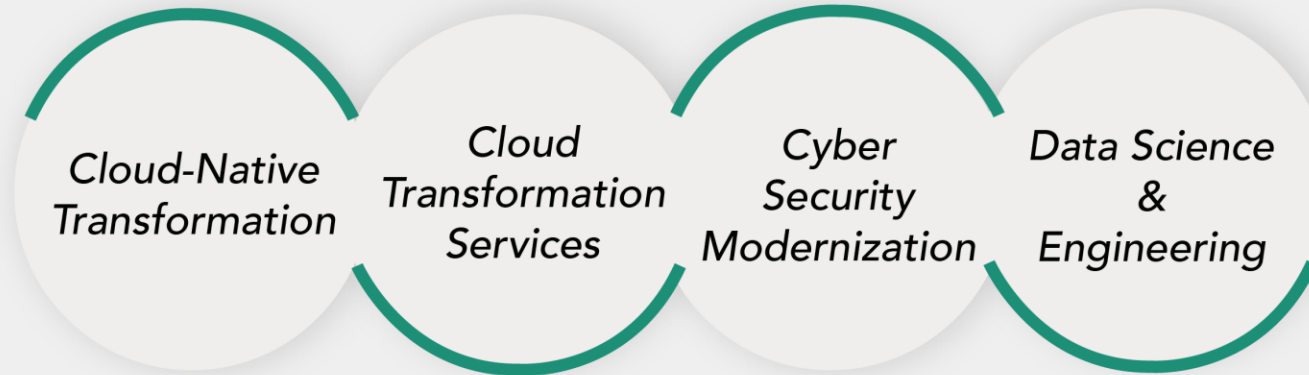
# **DELIVERING ON DIGITAL TRANSFORMATION & DISRUPTIVE TECHNOLOGIES**

# 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

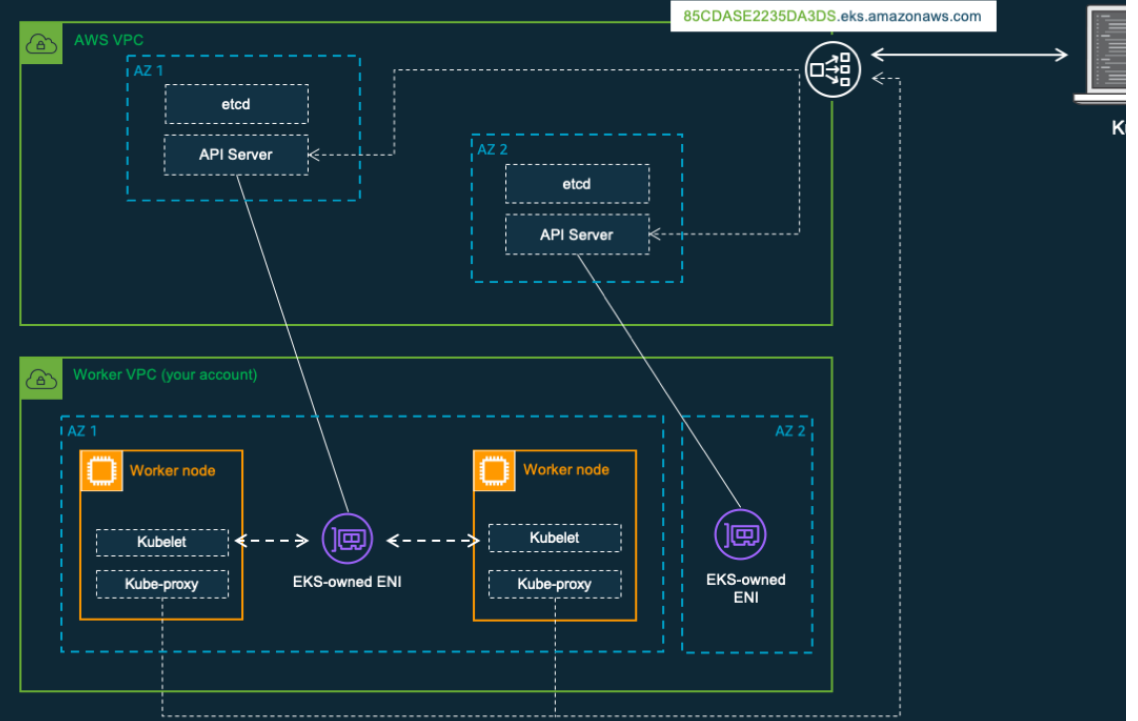
- Detecting and replacing unhealthy control planes
- Automated version upgrades
- Automated patching of control planes

# CONTROL PLANE ARCHITECTURE

Runs single tenant Kubernetes control plane for each cluster

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

Only public endpoint enabled





# INTEGRATES WITH AWS SERVICES

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

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# 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

<https://github.com/weaveworks/eksctl>

```
eksctl create cluster -f cluster.yaml
```

```
eksctl create cluster
```






```
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
```

# EKS MAKES KUBERNETES EASIER

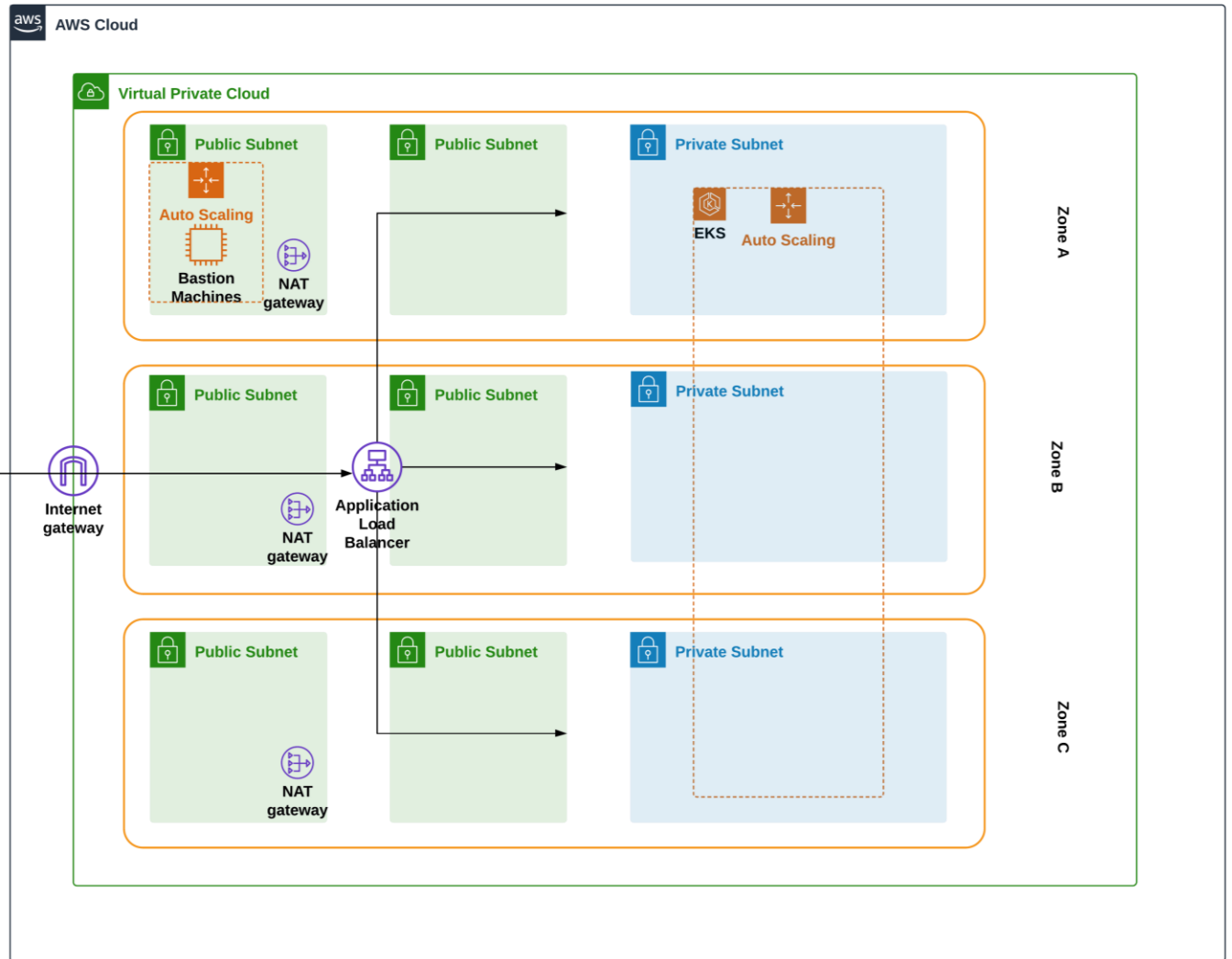
Manage and operate Kubernetes with ease

 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	<code>eksctl create cluster</code>
Upgrade a cluster	Upgrade your master nodes Cordon/drain and upgrade worker nodes individually	<code>eksctl upgrade cluster</code> <code>eksctl upgrade nodegroup</code>
Scale a cluster	Provision new VMs Install system components Register nodes with API server	<code>eksctl scale nodegroup</code>

# 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



# 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$
```

# CLUSTER MANAGEMENT

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

# Adding your IAM user to cluster

- Edit auth configmap with `$ kubectl edit -n kube-system configmap/aws-auth`
- Add user specific information under mapusers
- <https://docs.aws.amazon.com/eks/latest/userguide/add-user-role.html>

# AUTOSCALING

- Adding autoscaling specific configs in cluster.yaml before deploy
- Adding tags to autoscaling groups for discovery after cluster deploy
- Modifying cluster-autoscaler.yaml with your clustername, nodegroups
- Applying cluster-autoscaler.yaml into cluster
- <https://docs.aws.amazon.com/eks/latest/userguide/cluster-autoscaler.html>

# Spot Interrupt Handlers

- Defining your spot pricing strategy
- Adding in cluster.yaml before deploy
- Applying spot-interrupt-handler yaml into cluster after deploy
- [https://www.eksworkshop.com/beginner/150\\_spotworkers/deployhandler/](https://www.eksworkshop.com/beginner/150_spotworkers/deployhandler/)
- <https://aws.amazon.com/ec2/spot/pricing/>
- <https://aws.amazon.com/ec2/pricing/on-demand/>



# 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://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/blogs/containers/de-mystifying-cluster-networking-for-amazon-eks-worker-nodes/>
- [https://www.eksworkshop.com/beginner/150\\_spotworkers/deployhandler/](https://www.eksworkshop.com/beginner/150_spotworkers/deployhandler/)
- <https://aws.amazon.com/ec2/spot/pricing/>
- <https://aws.amazon.com/ec2/pricing/on-demand/>
- <https://eksctl.io/usage/creating-and-managing-clusters/>
- <https://github.com/weaveworks/eksctl>





# Q&A



# Thank you!

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