

Amazon EKS Overview & Comparison

Architecture, Best Practices, and EC2 Migration Considerations

What is Amazon EKS?

Amazon Elastic Kubernetes Service (EKS) is a managed Kubernetes service by AWS.

- AWS manages the control plane (multi-AZ, HA)
- Data plane runs in your VPC (EC2 or Fargate)
- Native AWS integrations: IAM, VPC CNI, ELB/NLB, EBS/EFS

EKS Architecture

EKS Request/Networking Flow

Best Practices & Workload Fit

Best suited workloads:

- Cloud-native microservices needing AWS integration
- Event/data streaming with autoscaling (Karpenter)
- Security-sensitive workloads (per-pod IAM, SGs for Pods)
- Teams offloading ops of control plane

Avoid or consider alternatives:

- Very small/low-cost clusters (control-plane fee overhead)
- Highly customized control plane needs
- Heavy DaemonSet usage on Fargate

EKS vs EC2 Cluster Approaches

- EKS vs kops: EKS removes etcd/masters ops, adds per-cluster cost
- EKS vs kubeadm: EKS avoids bootstrap toil, adds limits on control-plane tuning
- EKS vs plain EC2 ASGs: EKS provides orchestration & per-pod IAM vs raw VM simplicity

What You Gain & Lose Moving to EKS

Gains:

- No master/etcd ops, built-in HA
- Native AWS networking (VPC CNI, SGs for Pods)
- Pod Identity per workload
- Fargate option for serverless pods
- Faster autoscaling (Karpenter/Auto Mode)

Losses:

- Less control over control plane tuning
- Limited CNI flexibility vs DIY
- Extra per-cluster cost