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AWS ELASTIC KUBERNETES SERVICE (EKS)

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A MANAGED KUBERNETES SERVICE FOR MODERN APPLICATIONS

What is AWS EKS?

- Amazon Elastic Kubernetes Service (EKS): A fully managed Kubernetes service
- Eliminates the need to install, operate, and maintain your own Kubernetes control plane
- Certified Kubernetes conformant for compatibility with existing tools and plugins
- Runs the latest version of open-source Kubernetes software
- Automatically manages availability and scalability of Kubernetes control plane nodes

- Managed Control Plane: No need to provision or maintain control plane infrastructure
- High Availability: Control plane runs across multiple AWS Availability Zones
- Security: Integrated with AWS IAM for authentication and authorization

- Hybrid Cloud Ready: Compatible with EKS Anywhere for on-premises deployments
- Enterprise Grade: Used by thousands of organizations for mission-critical applications

CREATING EKS CLUSTERS

Multiple Creation Methods:

1. **AWS Management Console:** GUI-based setup wizard
2. **AWS CLI/SDK:** Command-line interface and API-based creation
3. **eksctl:** Purpose-built command-line utility for EKS
4. **Terraform:** Infrastructure as Code deployment

EKS ARCHITECTURE

1

Control Plane:

- Managed by AWS (etcd, API server, scheduler, controller)
- Automatically distributed across multiple AZs for high availability
- AWS handles patching, upgrades, and security hardening of control plane components

2

Data Plane:

- Your managed EC2 instances, Fargate profiles, or self-managed nodes.
- Flexible compute options with managed node groups, Fargate serverless, or self-managed nodes
- Nodes automatically register with the control plane through secure TLS bootstrap process

3

Add-ons:

- AWS and community-provided extensions for networking, monitoring, etc.
- Native AWS add-ons like VPC CNI, CoreDNS, and kube-proxy are managed by AWS
- Amazon EKS Add-on Manager simplifies installation and lifecycle management of operational software

KEY EKS FEATURES

- **Managed Node Groups:** Automates the provisioning and lifecycle of nodes
- **Fargate Integration:** Run containers without managing servers
- **AWS IAM Integration:** Control cluster authentication with IAM roles
- **VPC CNI Plugin:** Native AWS networking performance
- **EKS Distro:** Same Kubernetes distribution available for on-premises
- **Seamless Upgrades:** Simplifies Kubernetes version updates

EKS PRICING MODEL

- Control Plane: $0.10 per hour per cluster (~$73/month)
- Compute Resources: Standard EC2 or Fargate pricing applies
- Storage: Standard EBS pricing for persistent volumes
- Data Transfer: Standard AWS data transfer rates

Cost Optimization Strategies:

- Use Spot Instances for non-critical workloads (up to 90% savings)
- Implement Cluster Autoscaler for automatic scaling
- Consider Fargate for variable workloads (pay-per-pod)
- Leverage Karpenter for improved node provisioning efficiency

EKS DIFFERENTIATORS

- AWS Service Integrations: Seamless connections to 200+ AWS services
- Certified EKS Distro: Same distribution available for on-premises
- Observability Integration: CloudWatch Container Insights, X-Ray, Prometheus
- Bottlerocket Support: Secure, minimal Linux distribution for containers
- EKS Anywhere: Run EKS-compatible clusters on your own infrastructure

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THANK YOU

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