Training: AWS
Running Containers on Amazon Elastic Kubernetes Service (Amazon EKS)

TRAINING GOALS:

Amazon EKS makes it easy for you to run Kubernetes on AWS without needing to install, operate, and maintain your own Kubernetes control plane. In this course, you will learn container management and orchestration for Kubernetes using Amazon EKS.

You will build an Amazon EKS cluster, configure the environment, deploy the cluster, and then add applications to your cluster. You will manage container images using Amazon Elastic Container Registry (ECR) and learn how to automate application deployment. You will deploy applications using CI/CD tools. You will learn how to monitor and scale your environment by using metrics, logging, tracing, and horizontal/vertical scaling. You will learn how to design and manage a large container environment by designing for efficiency, cost, and resiliency. You will configure AWS networking services to support the cluster and learn how to secure your Amazon EKS environment.

Course objectives

In this course, you will learn to:

- Describe Kubernetes and Amazon EKS fundamentals and the impact of containers on workflows.
- Build an Amazon EKS cluster by selecting the correct compute resources to support worker nodes.
- Secure your environment with AWS Identity and Access Management (IAM) authentication and Kubernetes Role Based Access Control (RBAC) authorization.
- Deploy an application on the cluster. Publish container images to Amazon ECR and secure access via IAM policy.
- Deploy applications using automated tools and pipelines. Create a GitOps pipeline using WeaveFlux.
- Collect monitoring data through metrics, logs, and tracing with AWS X-Ray and identify metrics for performance tuning. Review scenarios where bottlenecks require the best scaling approach using horizontal or vertical scaling.
- Assess the tradeoffs between efficiency, resiliency, and cost and the impact of tuning for one over the others. Describe and outline a holistic, iterative approach to optimizing your environment. Design for cost, efficiency, and resiliency.
- Configure AWS networking services to support the cluster. Describe how Amazon Virtual Private Cloud (VPC) supports Amazon EKS clusters and simplifies inter-node communications. Describe the function of the VPC Container Network Interface (CNI). Review the benefits of a service mesh.

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- Upgrade your Kubernetes, Amazon EKS, and third party tools.

Intended audience

This course is intended for people who provide container orchestration management in the AWS Cloud including:

- DevOps engineers
- Systems administrators

CONSPECT:

- Module 1: Kubernetes Fundamentals
  - Container orchestration
  - Kubernetes objects
  - Kubernetes internals
- Module 2: Amazon EKS Fundamentals
  - Introduction to Amazon EKS
  - Amazon EKS control plane
  - Amazon EKS data plane
  - Fundamentals of Amazon EKS security
  - Amazon EKS API
- Module 3: Building an Amazon EKS Cluster
  - Configuring your environment
  - Creating an Amazon EKS cluster
  - Demo: Deploying a cluster
  - Deploying worker nodes
  - Demo: Completing a cluster configuration
  - Preparing for Lab 1: Building an Amazon EKS Cluster
- Module 4: Deploying Applications to Your Amazon EKS Cluster
  - Configuring Amazon Elastic Container Registry (Amazon ECR)
  - Demo: Configuring Amazon ECR
  - Deploying applications with Helm
  - Demo: Deploying applications with Helm
  - Continuous deployment in Amazon EKS
  - GitOps and Amazon EKS
  - Preparing for Lab 2: Deploying Applications
- Module 5: Configuring Observability in Amazon EKS

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- Configuring observability in an Amazon EKS cluster
- Collecting metrics
- Using metrics for automatic scaling
- Managing logs
- Application tracing in Amazon EKS
- Gaining and applying insight from observability
- Preparing for Lab 3: Monitoring Amazon EKS

- Module 6: Balancing Efficiency, Resilience, and Cost Optimization in Amazon EKS
  - The high level overview
  - Designing for resilience
  - Designing for cost optimization
  - Designing for efficiency
- Module 7: Managing Networking in Amazon EKS
  - Review: Networking in AWS
  - Communicating in Amazon EKS
  - Managing your IP space
  - Deploying a service mesh
  - Preparing for Lab 4: Exploring Amazon EKS Communication
- Module 8: Managing Authentication and Authorization in Amazon EKS
  - Understanding the AWS shared responsibility model
  - Authentication and authorization
  - Managing IAM and RBAC
  - Demo: Customizing RBAC roles
  - Managing pod permissions using RBAC service accounts
- Module 9: Implementing Secure Workflows
  - Securing cluster endpoint access
  - Improving the security of your workflows
  - Improving host and network security
  - Managing secrets
  - Preparing for Lab 5: Securing Amazon EKS
- Module 10: Managing Upgrades in Amazon EKS
  - Planning for an upgrade
  - Upgrading your Kubernetes version
  - Amazon EKS platform versions

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REQUIREMENTS:

We recommend that attendees of this course have:

- Completed Introduction to Containers
- Completed Amazon Elastic Kubernetes Service (EKS) Primer
- Completed AWS Cloud Practitioner Essentials (or equivalent real-world experience)
- Basic Linux administration experience
- Basic network administration experience
- Basic knowledge of containers and microservices

Difficulty level



CERTIFICATE:

The participants will obtain certificates signed by AWS (course completion).

TRAINER:

AWS Authorized Instructor (AAI)

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