

Running Containers on Amazon Elastic Kubernetes Service (Amazon EKS)

Course code: AWSRCAE

Who is the course for Those who will provide container orchestration management in the AWS Cloud including: DevOps engineers Systems administrators What we teach you Review and examine containers, 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 by creating an Amazon EKS service role for your cluster deploy an application on the cluster. Publish container images to ECR and secure access via IAM policy. Automate and deploy applications, examine automation tools and pipelines. Create a GitOps pipeline using WeaveFlux. Collect monitoring data through metrics, logs, 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 impact for tuning one over the other. Describe and outline a holistic, iterative approach to optimizing your environment. Design for cost, efficiency, and resiliency Configure the AWS networking services to support the cluster. Describe how EKS/Amazon Virtual Private Cloud (VPC) functions and simplifies inter-node communications. Describe the function of VPC Container Network Interface (CNI). Review the benefits of a service mesh. Upgrade your Kubernetes, Amazon EKS, and third party tools. Required skills 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 Teaching methods Professional explanation with practical samples and examples. Teaching materials Amazon guide book for this course.

Course outline Day 1

Module 0: Course Introduction

Course preparation activities and agenda

Module 1: Container Fundamentals

Best practices for building applications

Container fundamentals

Components of a container

Module 2: Kubernetes Fundamentals

Container orchestration

Kubernetes objects

Kubernetes internals

Preparing for Lab 1: Deploying Kubernetes Pods

Module 3: Amazon EKS Fundamentals

Introduction to Amazon EKS

Amazon EKS control plane

Amazon EKS data plane

Fundamentals of Amazon EKS security

Amazon EKS API

Module 4: Building an Amazon EKS Cluster

Configuring your environment

Creating an Amazon EKS cluster

Demo: Configuring and deploying clusters in the AWS Management Console

Working with eksctl

Preparing for Lab 2: Building an Amazon EKS Cluster

Day 2

Module 5: 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 3: Deploying App

Module 6: Configuring Observability in Amazon EKS

Configuring observability in an Amazon EKS cluster

GOPAS Praha

Kodářská 1441/46

101 00 Praha 10

Tel.: +420 234 064 900-3

info@gopas.cz

GOPAS Brno

Nové sady 996/25

602 00 Brno

Tel.: +420 542 422 111

info@gopas.cz

GOPAS Bratislava

Dr. Vladimíra Clementisa 10

Bratislava, 821 02

Tel.: +421 248 282 701-2

info@gopas.sk



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Running Containers on Amazon Elastic Kubernetes Service (Amazon EKS)

Collecting metrics
Using metrics for automatic scaling
Managing logs
Application tracing in Amazon EKS
Gaining and applying insight from observability
Preparing for Lab 4: Monitoring Amazon EKS
Module 7: Balancing Efficiency, Resilience, and Cost Optimization in Amazon EKS
The high level overview
Designing for resilience
Designing for cost optimization
Designing for efficiency
Day 3
Module 8: Managing Networking in Amazon EKS
Review: Networking in AWS
Communicating in Amazon EKS
Managing your IP space
Deploying a service mesh
Preparing for Lab 5: Exploring Amazon EKS Communication
Module 9: 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 10: Implementing Secure Workflows
Securing cluster endpoint access
Improving the security of your workflows
Improving host and network security
Managing secrets
Preparing for Lab 6: Securing Amazon EKS
Module 11: Managing Upgrades in Amazon EKS
Planning for an upgrade
Upgrading your Kubernetes version
Amazon EKS platform versions

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- Assess the tradeoffs between efficiency, resiliency, and cost and impact for tuning one over the other. Describe and outline a holistic, iterative approach to optimizing your environment. Design for cost, efficiency, and resiliency
- Configure the AWS networking services to support the cluster. Describe how EKS/Amazon Virtual Private Cloud (VPC) functions and simplifies inter-node communications. Describe the function of VPC Container Network Interface (CNI). Review the benefits of a service mesh.
- Upgrade your Kubernetes, Amazon EKS, and third party tools.

Required skills

- 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

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Demo: Configuring Amazon ECR

Deploying applications with Helm

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The high level overview

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Designing for cost optimization

Designing for efficiency

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Amazon EKS platform versions

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GOPAS Brno
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