Elastic Container Services

Course outline

Module 1: Introduction to Containers and Docker

Module 1 of the Elastic Container Services course provides an introduction to containers and Docker. It covers the basics of container technology, how to use Docker to create and manage containers, and how to deploy and manage applications in a containerized environment. It also covers the fundamentals of container orchestration and how to use Amazon ECS to deploy and manage containerized applications.

Lessons

- Overview of Containers and Docker
- Introduction to Docker Images and Containers
- Working with Docker Hub and Docker Compose
- Deploying Containers with Amazon ECS
- Managing Containers with Amazon ECS
- Scaling Containers with Amazon ECS
- Monitoring Containers with Amazon ECS
- Security and Access Control for Containers
- Troubleshooting Containers with Amazon ECS
- Best Practices for Container Deployment with Amazon ECS

After completing this module, students will be able to:

- Understand the fundamentals of containers and Docker
- Be able to deploy and manage Docker containers on AWS
- Utilize the Docker CLI to create and manage images and containers
- Understand the benefits of using Elastic Container Service (ECS) for container orchestration and management

Module 2: Introduction to Amazon Elastic Container Service (ECS)

Module 2 of the Elastic Container Services course introduces students to Amazon Elastic Container Service (ECS). This module covers the basics of ECS, including its architecture, components, and features. Students will learn how to create and manage ECS clusters, launch tasks, and configure services. Additionally, students will gain an understanding of the different types of ECS tasks and services, and how to use them to deploy and manage applications.

Lessons

- Overview of Amazon ECS
- Setting up an Amazon ECS Cluster
- Working with Amazon ECS Tasks and Services
- Configuring Amazon ECS Container Instances
- Working with Amazon ECS Task Definitions
- Working with Amazon ECS Services
- Working with Amazon ECS Container Security
- Working with Amazon ECS Storage
- Working with Amazon ECS Networking
- Monitoring and Logging with Amazon ECS

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and its components.
- Set up and configure an ECS cluster and deploy applications to it.
- Monitor and manage the performance of ECS clusters and applications.
- Utilize ECS features such as auto-scaling, service discovery, and task scheduling.

Module 3: Setting up an ECS Cluster

Module 3 of the Elastic Container Services course covers the basics of setting up an ECS Cluster. It covers topics such as creating a cluster, configuring the cluster, and deploying applications to the cluster. It also covers how to monitor and manage the cluster, as well as how to scale the cluster. This module is designed to give students the knowledge and skills needed to successfully set up and manage an ECS Cluster.

Lessons

- Overview of ECS and its components
- Creating an ECS Cluster
- Configuring Security Groups for ECS
- Deploying Applications to an ECS Cluster
- Monitoring and Logging with ECS
- Scaling an ECS Cluster
- Automating ECS Cluster Deployment
- Integrating ECS with other AWS Services
- Troubleshooting ECS Clusters
- Best Practices for ECS Cluster Management

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and how to set up an ECS cluster.
- Configure and deploy applications to an ECS cluster using the AWS Management Console.
- Utilize the AWS Command Line Interface (CLI) to manage and deploy applications to an ECS cluster.
- Monitor and troubleshoot an ECS cluster using CloudWatch and other AWS services.

Module 4: Deploying and Managing Containers with ECS

Module 4 of the Deploying and Managing Containers with ECS course covers the basics of deploying and managing containers with Amazon Elastic Container Service (ECS). It covers topics such as creating and configuring ECS clusters, deploying and managing containerized applications, and monitoring and troubleshooting ECS clusters. This module also provides an introduction to Amazon ECS task definitions and container networking.

Lessons

- Introduction to Amazon ECS
- Setting up an ECS Cluster
- Deploying Containers with ECS
- Managing Containers with ECS
- Scaling Containers with ECS
- Monitoring Containers with ECS
- Troubleshooting Containers with ECS
- Security Best Practices for ECS
- Integrating ECS with Other AWS Services
- Automating ECS with CloudFormation

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and its components.
- Create and manage ECS clusters and tasks.
- Deploy and manage Docker containers on ECS.
- Monitor and troubleshoot ECS clusters and tasks.

Module 5: Working with ECS Task Definitions

Module 5 of the Elastic Container Services course focuses on working with ECS Task Definitions. This module covers topics such as creating and managing task definitions, configuring task execution roles, and setting up task networking. It also covers how to use the AWS CLI and SDKs to manage task definitions. Finally, the module provides an overview of the different types of task definitions and how to use them in your applications.

Lessons

- Overview of Task Definitions
- Creating a Task Definition
- Configuring Task Definition Parameters
- Working with Task Placement Constraints
- Working with Task Role and Task Execution Role
- Working with Task Networking
- Working with Task Storage
- Working with Task Logging

- Working with Task Health Checks
- Working with Task Timeouts
- Working with Task Security
- Working with Task Scheduling
- Working with Task Auto Scaling
- Working with Task Tags
- Working with Task Family Versioning
- Working with Task Caching
- Working with Task Resource Limits
- Working with Task Environment Variables
- Working with Task Secrets
- Working with Task IAM Roles for Tasks

After completing this module, students will be able to:

- Understand the purpose and components of a Task Definition
- Create and configure a Task Definition for an ECS service
- Deploy and manage a Task Definition in an ECS cluster
- Monitor and troubleshoot Task Definitions in an ECS cluster

Module 6: Working with ECS Services

Module 6 of the Elastic Container Services course covers the basics of working with ECS services. It covers topics such as creating and managing services, configuring service settings, and deploying services. It also covers how to monitor and troubleshoot services, as well as how to scale services. This module provides a comprehensive overview of the fundamentals of working with ECS services.

Lessons

- Introduction to ECS Services
- Setting up an ECS Cluster
- Deploying Containers with ECS
- Managing ECS Services
- Scaling ECS Services
- Monitoring ECS Services
- Troubleshooting ECS Services
- Security Best Practices for ECS Services
- Integrating ECS Services with Other AWS Services
- Automating ECS Services with CloudFormation

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and its components.
- Create and manage ECS clusters and services.
- Deploy and manage Docker containers on ECS.
- Monitor and troubleshoot ECS services and clusters.

Module 7: Working with ECS Container Instances

Module 7 of the Elastic Container Services course covers how to work with ECS Container Instances. This module will teach you how to create, configure, and manage ECS Container Instances, as well as how to use the Amazon ECS console and the AWS CLI to manage them. You will also learn how to use the Amazon ECS API to create and manage container instances.

Lessons

- Introduction to ECS Container Instances
- Creating and Configuring ECS Container Instances
- Working with ECS Container Instances
- Managing ECS Container Instances
- Monitoring ECS Container Instances
- Troubleshooting ECS Container Instances
- Best Practices for Working with ECS Container Instances
- Security Considerations for ECS Container Instances
- Automating ECS Container Instances
- Scaling ECS Container Instances

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and how to use it to deploy and manage containerized applications.
- Create and configure an ECS cluster and deploy a containerized application to it.
- Monitor and troubleshoot ECS clusters and applications.
- Utilize ECS features such as task placement strategies, service discovery, and task scheduling.

Module 8: Working with ECS Container Security

Module 8 of the Elastic Container Services course covers the security of ECS containers. It covers topics such as authentication, authorization, and encryption, as well as how to secure your containers from external threats. It also covers how to use IAM roles and policies to control access to your containers. Finally, it covers how to monitor and audit your containers for security issues.

Lessons

- Understanding ECS Container Security
- Configuring ECS Container Security
- Implementing ECS Container Security
- Securing ECS Container Images
- Managing ECS Container Security
- Troubleshooting ECS Container Security
- Auditing ECS Container Security
- Best Practices for ECS Container Security
- Automating ECS Container Security
- Integrating ECS Container Security with Other Security Solutions

After completing this module, students will be able to:

- Understand the security features of ECS and how to configure them.
- Implement security best practices for ECS containers.
- Monitor and audit ECS container security.
- Troubleshoot and resolve security issues related to ECS containers.

Module 9: Working with ECS Container Storage

Module 9 of the Elastic Container Services course covers the basics of working with ECS Container Storage. It covers topics such as setting up and configuring ECS Container Storage, creating and managing storage buckets, and using the ECS Container Storage API. It also covers best practices for using ECS Container Storage and troubleshooting common issues.

Lessons

- Introduction to ECS Container Storage
- Understanding ECS Container Storage Architecture
- Configuring ECS Container Storage
- Managing ECS Container Storage
- Troubleshooting ECS Container Storage
- Best Practices for ECS Container Storage
- Security Considerations for ECS Container Storage
- Automating ECS Container Storage
- Monitoring ECS Container Storage
- Optimizing ECS Container Storage Performance

After completing this module, students will be able to:

- Understand the fundamentals of Amazon ECS Container Storage and how to use it to store and manage data.
- Create and manage Amazon ECS Container Storage buckets and objects.
- Configure and manage access control policies for Amazon ECS Container Storage buckets and objects.
- Utilize Amazon ECS Container Storage to store and manage data for applications running on Amazon ECS.

Module 10: Working with ECS Container Networking

Module 10 of the Elastic Container Services course covers the fundamentals of working with ECS Container Networking. It covers topics such as creating and managing container networks, configuring network security, and troubleshooting network issues. This module provides an in-depth look at the networking capabilities of ECS and how to use them to create secure and reliable container networks.

Lessons

- Overview of ECS Container Networking
- Configuring Networking for ECS Containers
- Understanding Network Security Groups
- Setting Up Network Load Balancing
- Working with Network Interfaces
- Troubleshooting ECS Container Networking
- Best Practices for ECS Container Networking
- Automating ECS Container Networking
- Monitoring ECS Container Networking
- Integrating ECS Container Networking with Other AWS Services

After completing this module, students will be able to:

- Understand the fundamentals of Amazon ECS container networking and how to configure it.
- Create and manage Amazon ECS clusters and services.
- Configure and manage Amazon ECS container networking components such as security groups, network ACLs, and subnets.
- Troubleshoot and debug Amazon ECS container networking issues.

Module 11: Working with ECS Container Logging

Module 11 of the Elastic Container Services course covers how to use ECS Container Logging to monitor and troubleshoot your containerized applications. It covers topics such as setting up logging drivers, configuring log rotation, and using CloudWatch Logs to view and analyze your logs. It also covers how to use CloudWatch Logs Insights to query and visualize your logs.

Lessons

- Overview of ECS Container Logging
- Configuring Logging for ECS Containers
- Understanding Logging Drivers for ECS Containers
- Setting Up CloudWatch Logs for ECS Containers
- Troubleshooting ECS Container Logging Issues
- Best Practices for ECS Container Logging
- Integrating ECS Container Logging with Third-Party Tools
- Automating ECS Container Logging with CloudFormation
- Monitoring ECS Container Logging with CloudWatch
- Optimizing ECS Container Logging Performance

After completing this module, students will be able to:

- Understand the fundamentals of Amazon ECS Container Logging and how to configure it.
- Set up and configure the Amazon ECS Container Logging service to collect and store container logs.
- Analyze and troubleshoot container logs using Amazon ECS Container Logging.
- Monitor and optimize the performance of Amazon ECS Container Logging.

Module 12: Working with ECS Container Orchestration

Module 12 of the Elastic Container Services course covers the basics of working with ECS Container Orchestration. It covers topics such as setting up an ECS cluster, deploying and managing containers, and scaling and monitoring applications. It also covers best practices for using ECS to manage containerized applications.

Lessons

- Introduction to ECS Container Orchestration
- Understanding ECS Container Orchestration Components
- Setting up ECS Container Orchestration
- Configuring ECS Container Orchestration
- Deploying Applications with ECS Container Orchestration
- Managing ECS Container Orchestration
- Monitoring ECS Container Orchestration
- Troubleshooting ECS Container Orchestration
- Security Best Practices for ECS Container Orchestration
- Automating ECS Container Orchestration with AWS CloudFormation

After completing this module, students will be able to:

- Understand the fundamentals of container orchestration and the benefits of using ECS for container orchestration.
- Set up and configure an ECS cluster and deploy applications to it.
- Monitor and manage the performance of applications running on the ECS cluster.
- Troubleshoot and debug issues related to the ECS cluster and applications running on it.

Module 13: Working with ECS Container Monitoring

Module 13 of the Elastic Container Services course covers the basics of working with ECS Container Monitoring. This module will teach you how to monitor your containers and services, set up alarms, and troubleshoot issues. You will also learn how to use CloudWatch Logs and CloudWatch Events to monitor your containers and services.

Lessons

- Introduction to ECS Container Monitoring
- Understanding ECS Container Metrics
- Configuring ECS Container Monitoring
- Setting Up CloudWatch Logs for ECS Containers
- Analyzing ECS Container Performance
- Troubleshooting ECS Container Issues
- Best Practices for ECS Container Monitoring
- Automating ECS Container Monitoring
- Integrating ECS Container Monitoring with Third-Party Tools
- Advanced ECS Container Monitoring Strategies

After completing this module, students will be able to:

- Understand the basics of Amazon ECS and how to use it to deploy and manage containers.
- Set up and configure Amazon ECS container monitoring.
- Monitor and troubleshoot container performance using Amazon ECS container monitoring.
- Utilize Amazon ECS container monitoring to optimize container performance.

Module 14: Working with ECS Container Auto-Scaling

Module 14 of the Elastic Container Services course covers how to use ECS Container Auto-Scaling to automatically scale your containerized applications. This module will teach you how to configure auto-scaling policies, set up scaling targets, and monitor the performance of your applications. You will also learn how to use CloudWatch metrics to trigger scaling events and how to use CloudFormation templates to automate the process.

Lessons

- Overview of ECS Container Auto-Scaling
- Setting Up ECS Container Auto-Scaling
- Configuring ECS Container Auto-Scaling
- Monitoring ECS Container Auto-Scaling
- Troubleshooting ECS Container Auto-Scaling
- Best Practices for ECS Container Auto-Scaling
- Advanced Features of ECS Container Auto-Scaling
- Integrating ECS Container Auto-Scaling with Other AWS Services
- Security Considerations for ECS Container Auto-Scaling
- Cost Optimization Strategies for ECS Container Auto-Scaling

After completing this module, students will be able to:

- Understand the fundamentals of Amazon ECS and how to use it to deploy and manage containerized applications.
- Configure and manage ECS clusters and services.
- Utilize ECS Container Auto-Scaling to automatically scale up or down the number of containers running in an ECS cluster.
- Monitor and troubleshoot ECS clusters and services.

Module 15: Working with ECS Container Scheduling

Module 15 of the Elastic Container Services course covers the basics of working with ECS Container Scheduling. It covers topics such as creating and managing ECS clusters, configuring task definitions, and scheduling tasks. It also covers how to use the ECS console and the AWS CLI to manage and monitor your ECS clusters.

Lessons

- Overview of ECS Container Scheduling
- Understanding ECS Container Scheduling Concepts
- Setting up ECS Container Scheduling
- Configuring ECS Container Scheduling
- Deploying ECS Container Scheduling
- Monitoring ECS Container Scheduling
- Troubleshooting ECS Container Scheduling
- Best Practices for ECS Container Scheduling
- Automating ECS Container Scheduling
- Integrating ECS Container Scheduling with Other Services

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and its components.
- Create and manage ECS clusters and tasks.
- Deploy and manage applications using ECS.
- Monitor and troubleshoot ECS clusters and tasks.

Module 16: Working with ECS Container Clustering

Module 16 of the Elastic Container Services course covers the fundamentals of working with ECS Container Clustering. This module will teach students how to create and manage clusters, deploy applications, and monitor performance. Additionally, students will learn how to use the AWS Management Console and the AWS CLI to manage their clusters.

Lessons

- Introduction to ECS Container Clustering
- Setting up an ECS Cluster
- Configuring ECS Container Instances
- Deploying Containers to an ECS Cluster
- Managing ECS Container Clusters
- Scaling ECS Clusters
- Monitoring ECS Clusters
- Troubleshooting ECS Clusters
- Security Best Practices for ECS Clusters
- Integrating ECS with Other AWS Services

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and its components.
- Create and manage ECS clusters and tasks.
- Deploy and manage applications using ECS.
- Monitor and troubleshoot ECS clusters and tasks.

Module 17: Working with ECS Container Deployment Strategies

Module 17 of the Elastic Container Services course covers the different strategies for deploying containers on ECS. It covers topics such as task placement strategies, task scheduling, and service discovery. It also covers how to use the ECS console and the AWS CLI to deploy and manage containers.

Lessons

- Overview of ECS Container Deployment Strategies
- Understanding the Benefits of ECS Container Deployment
- Setting Up an ECS Container Deployment Environment
- Configuring ECS Container Deployment Strategies
- Deploying Containers with ECS
- Scaling ECS Container Deployment
- Monitoring and Troubleshooting ECS Container Deployment
- Best Practices for ECS Container Deployment
- Automating ECS Container Deployment
- Security Considerations for ECS Container Deployment

After completing this module, students will be able to:

- Understand the different deployment strategies available for ECS, such as rolling updates, blue/green deployments, and canary deployments.
- Utilize the AWS CLI and CloudFormation to create and manage ECS clusters and services.
- Configure ECS services to use Auto Scaling for scaling up and down based on demand.
- Implement automated deployment pipelines for ECS services using AWS CodePipeline and CodeBuild.

Module 18: Working with ECS Container Services

Module 18 of the Elastic Container Services course covers the basics of working with ECS Container Services. It covers topics such as setting up an ECS cluster, creating tasks and services, and deploying applications to ECS. It also covers how to monitor and troubleshoot ECS services.

Lessons

- Introduction to ECS Container Services
- Setting up an ECS Cluster
- Deploying Containers with ECS
- Managing ECS Services
- Scaling ECS Services
- Monitoring ECS Services
- Security and Access Control for ECS
- Integrating ECS with Other AWS Services
- Troubleshooting ECS Services
- Best Practices for Working with ECS

After completing this module, students will be able to:

- Understand the fundamentals of Amazon Elastic Container Service (ECS) and its components.
- Create and manage ECS clusters and tasks.
- Deploy and manage applications using ECS.
- Monitor and troubleshoot ECS clusters and tasks.

Module 19: Working with ECS Container Service Discovery

Module 19 of the Elastic Container Services course covers the use of ECS Container Service Discovery to enable applications to discover and communicate with each other. This module will teach students how to use the service discovery feature of ECS to register and discover services, as well as how to use the service discovery API to query for services. Additionally, students will learn how to use the service discovery feature to create a service mesh for their applications.

Lessons

- Overview of ECS Container Service Discovery
- Setting up ECS Container Service Discovery
- Configuring ECS Container Service Discovery
- Troubleshooting ECS Container Service Discovery
- Best Practices for ECS Container Service Discovery
- Integrating ECS Container Service Discovery with Other Services
- Automating ECS Container Service Discovery
- Security Considerations for ECS Container Service Discovery
- Monitoring ECS Container Service Discovery
- Scaling ECS Container Service Discovery

After completing this module, students will be able to:

- Understand the fundamentals of Amazon ECS and its components
- Configure and deploy applications using Amazon ECS
- Utilize Amazon ECS Container Service Discovery to register and discover services
- Monitor and troubleshoot applications running on Amazon ECS

Module 20: Working with ECS Container Service Load Balancing

Module 20 of the Elastic Container Services course covers the use of Load Balancing to manage traffic to and from ECS containers. It covers topics such as setting up a load balancer, configuring health checks, and troubleshooting common issues. It also provides an overview of the different types of load balancers available and how to choose the best one for your application.

Lessons

- Overview of ECS Container Service Load Balancing
- Setting up ECS Container Service Load Balancing
- Configuring ECS Container Service Load Balancing

- Troubleshooting ECS Container Service Load Balancing
- Best Practices for ECS Container Service Load Balancing
- Security Considerations for ECS Container Service Load Balancing
- Monitoring ECS Container Service Load Balancing
- Automating ECS Container Service Load Balancing
- Integrating ECS Container Service Load Balancing with Other Services
- Advanced Features of ECS Container Service Load Balancing

After completing this module, students will be able to:

- Understand the concepts of ECS Container Service Load Balancing and how to configure it.
- Create and manage ECS Container Service Load Balancing resources.
- Utilize ECS Container Service Load Balancing to distribute traffic across multiple containers.
- Monitor and troubleshoot ECS Container Service Load Balancing resources.