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This study guide demonstrates the lesson from *Introduction to ECS – Run Containers in the AWS Cloud*.

My full AWS Architect Associate course can be found here:

<https://www.udemy.com/course/ultimateaws/?referralCode=7ED214B795C444141361>

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## Running Docker Containers in AWS Environment Study Guide

### Introduction to Docker Containers in AWS

Running Docker containers within the AWS environment introduces an efficient, scalable way to deploy applications using microservices. Containers provide a lightweight alternative to traditional VMs, encapsulating applications with their dependencies and configurations in self-contained environments.

### Container Basics

- **Container Images:** These are blueprints for containers, containing the application code, dependencies, and necessary configurations. Container images are stored in a container registry, a library where images are housed until needed for deployment.
- **Container Hosts:** Containers run on container hosts, which can be either physical servers, virtual machines, or cloud instances like AWS EC2 instances. AWS also offers Fargate, a serverless option for running containers without managing the underlying EC2 instances.

### Container Orchestration with ECS

Container orchestration is crucial for managing multiple containers' deployment, scaling, and failure handling. AWS provides the Elastic Container Service (ECS) as a container orchestration tool to automate these tasks, ensuring efficient container management across EC2 instances or with Fargate.

### Elastic Container Registry (ECR)

AWS's ECR is a managed Docker container registry service that allows developers to store, manage, and deploy Docker container images. It is integrated with ECS, simplifying the development to production workflow for containerized applications.

### **ECS Clusters and Auto Scaling**

- **ECS Cluster Setup:** An ECS cluster is a collection of container hosts where containers are deployed. In EC2 mode, you're responsible for the operating system and instance management, including patching and scaling.
- **Auto Scaling Groups:** ECS can integrate with AWS Auto Scaling to automatically adjust the number of EC2 instances in the cluster based on demand, optimizing resource utilization and cost.

### **Managing EC2 Instances for ECS**

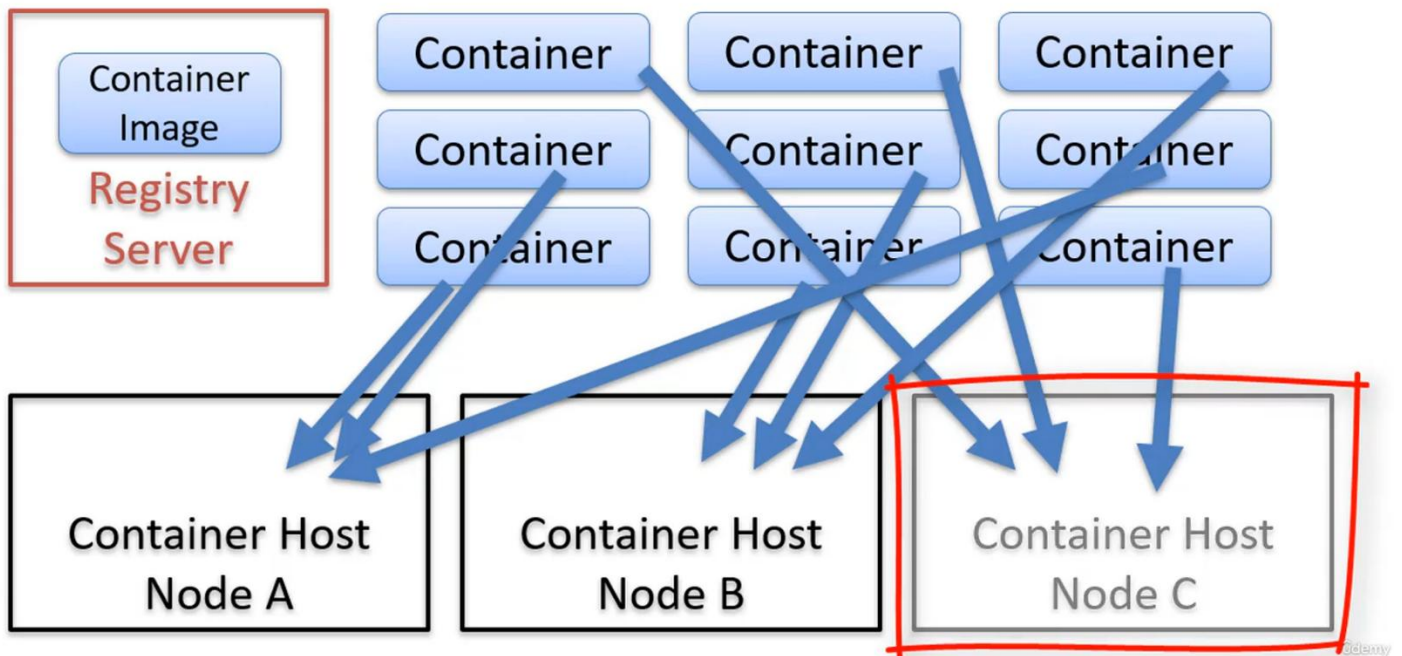
While ECS handles container orchestration, managing the underlying EC2 instances involves overseeing the operating system, applying patches, and updating AMIs. AWS offers options to automate these tasks, reducing the operational burden on developers.

### **Key Takeaways**

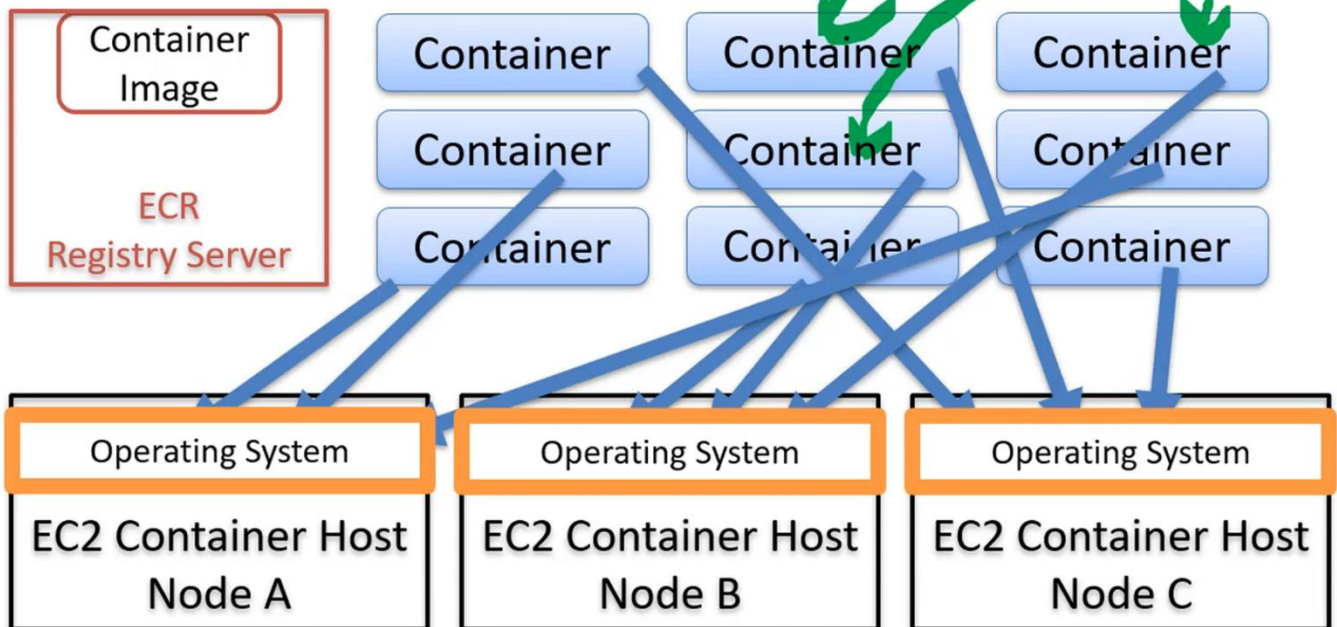
- Docker containers offer a scalable and efficient way to deploy applications in AWS.
- ECS provides robust orchestration capabilities, simplifying container deployment, scaling, and management.
- ECR serves as a centralized repository for container images, facilitating easy storage and retrieval.
- Auto Scaling ensures that the ECS cluster scales according to demand, improving resource efficiency.
- Managing EC2 instances for ECS requires attention to operating system maintenance and security, although AWS provides tools and services to alleviate some of these responsibilities.

*See slides below:*

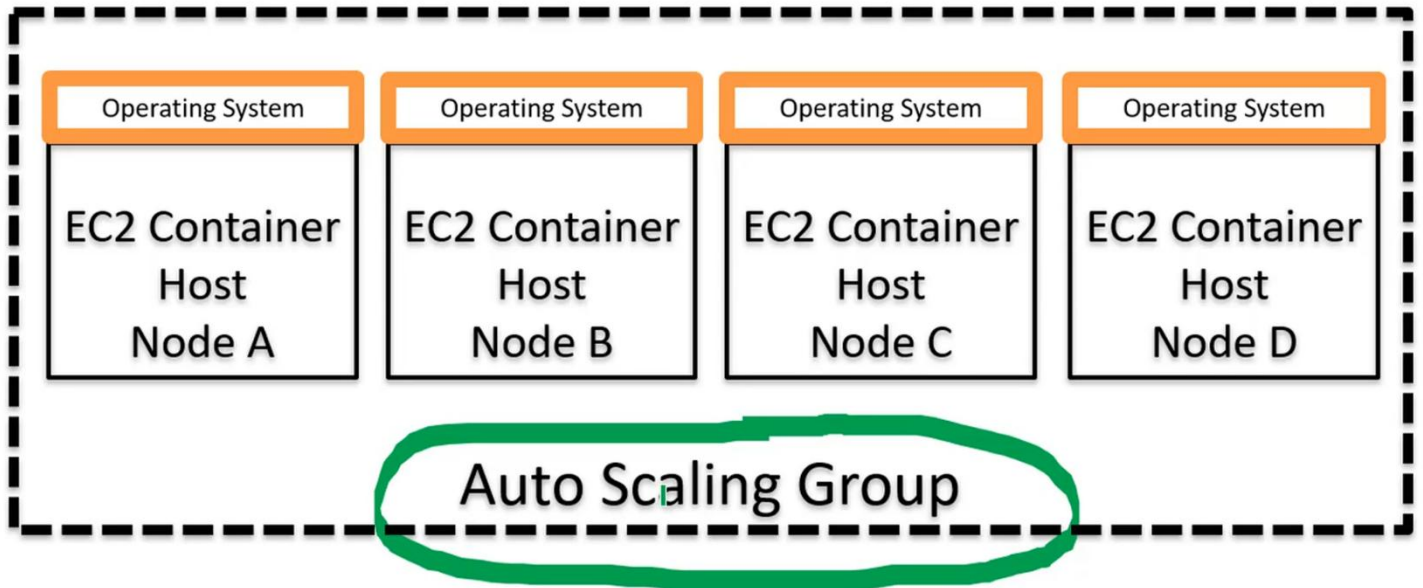
# Container Orchestration



# ECS (Elastic Container Service)



# ECS Cluster



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