0

Module 12

aws training and certification

The architectural problem

Now that your monolithic architecture is decoupled, the individual components are managed by separate teams—which can lead to conflicts if one team changes their components.

Module Overview

- Building Microservices
- Container Services
- Going Serverless

1

aws training and certification

Building Microservices

2

What Are Microservices?

aws training and certification

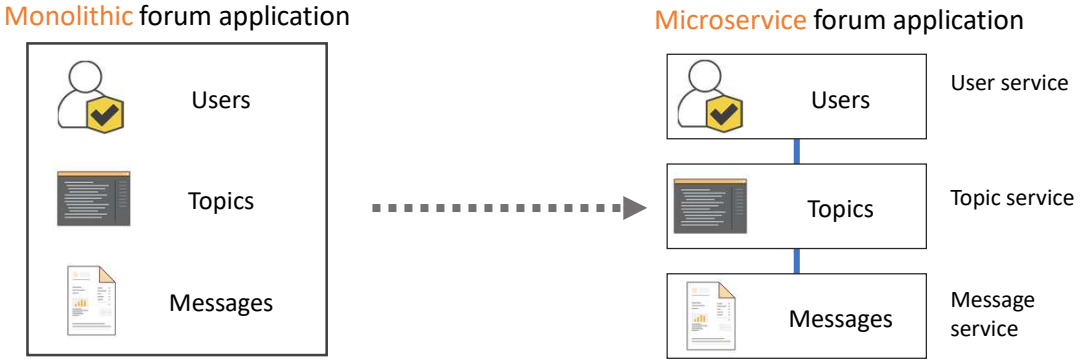
Applications composed of independent services that communicate over well-defined APIs

3

What Are Microservices?

aws training and certification

Applications composed of independent services that communicate over well-defined APIs

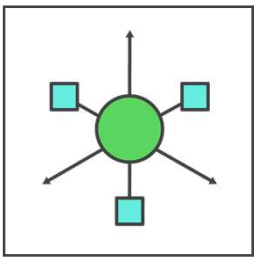


4

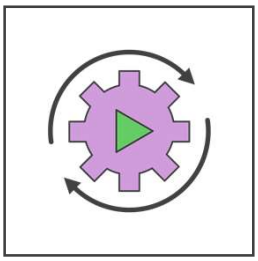
Characteristics of a Microservice

aws training and certification

Autonomous



Specialized



5

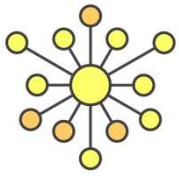
aws training and certification

Container Services

6

Let's Talk About Containers

aws training and certification



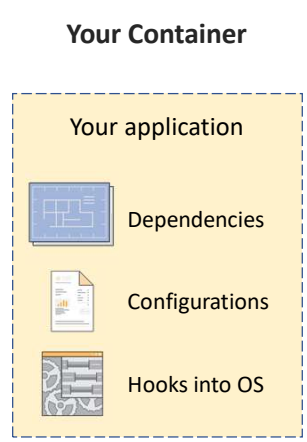
Repeatable

Self-contained execution environments

Faster to wind up and down than VMs

7

What is a Container?



8

What Problems Can Containers Solve?

Getting software to run reliably in different environments

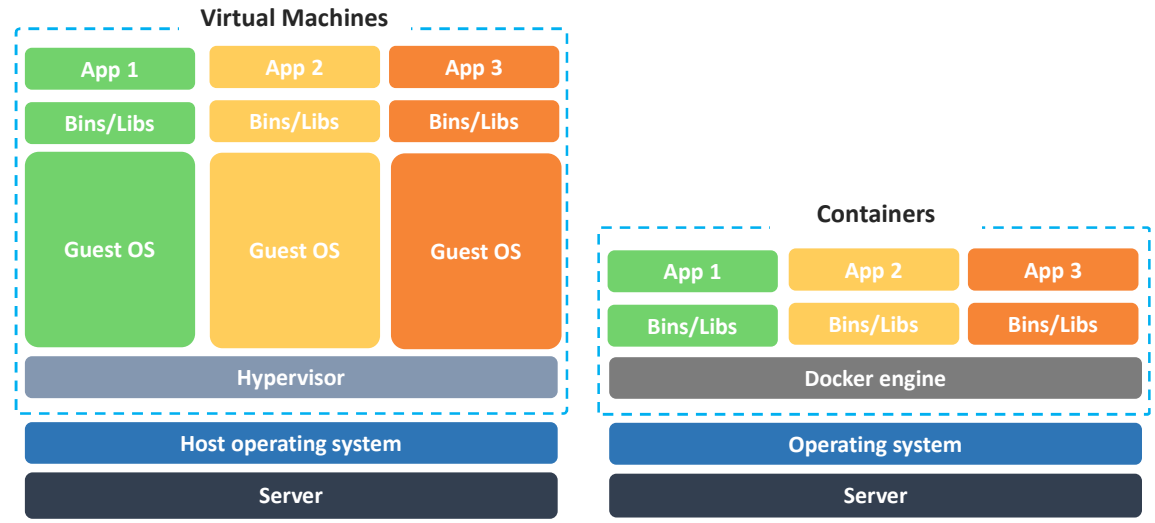
Developer's workstation

Production

Test environment

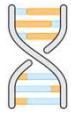
9

Containers vs. Virtual Machines

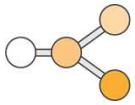


10

Amazon Elastic Container Service (Amazon ECS)



Orchestrates the execution of containers

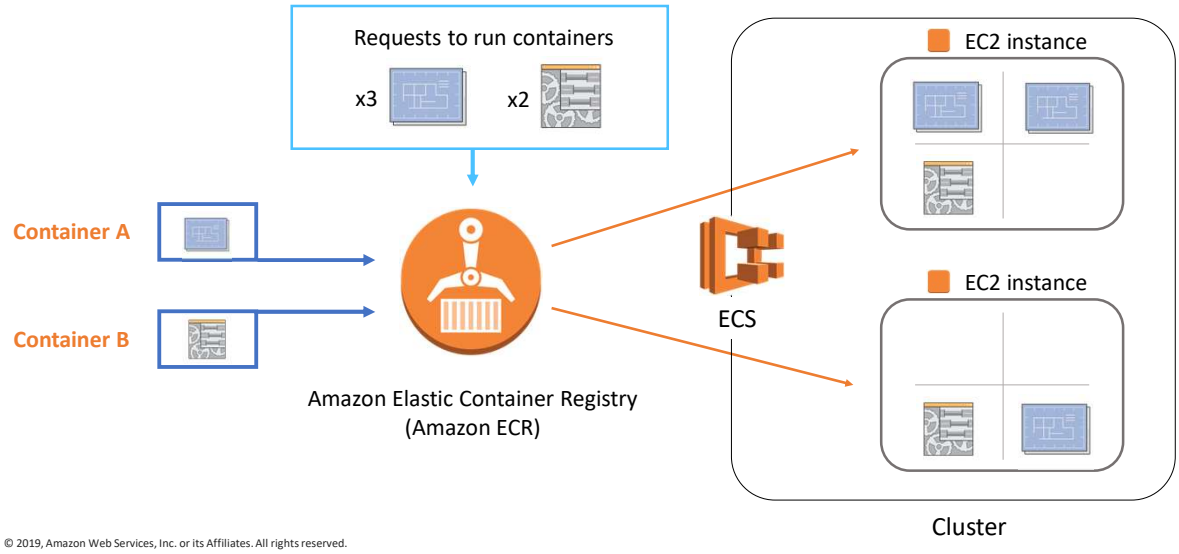


Maintains and scales the fleet of nodes running your containers

Removes the complexity of standing up the infrastructure

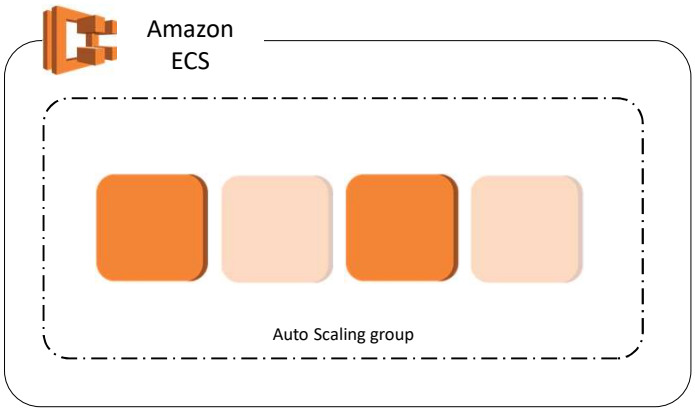
11

Working With Amazon ECS



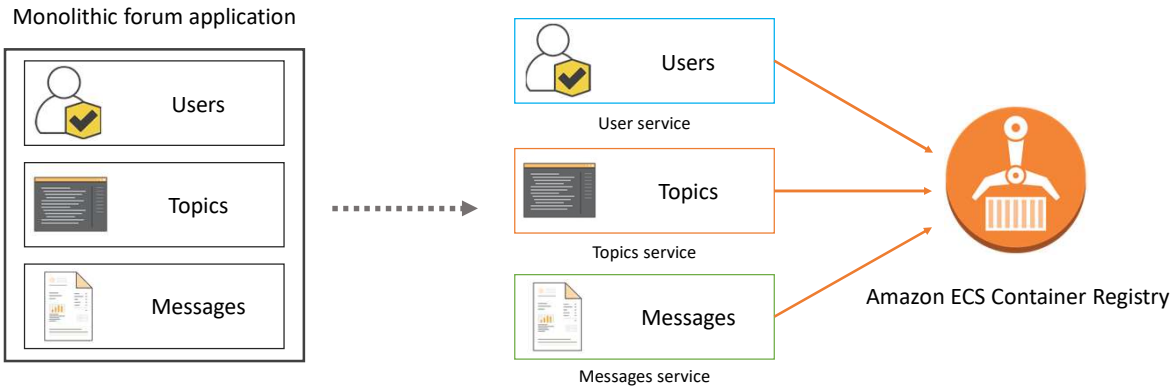
12

You can Automatic Scale the Number of Available EC2 Instances for Amazon ECS



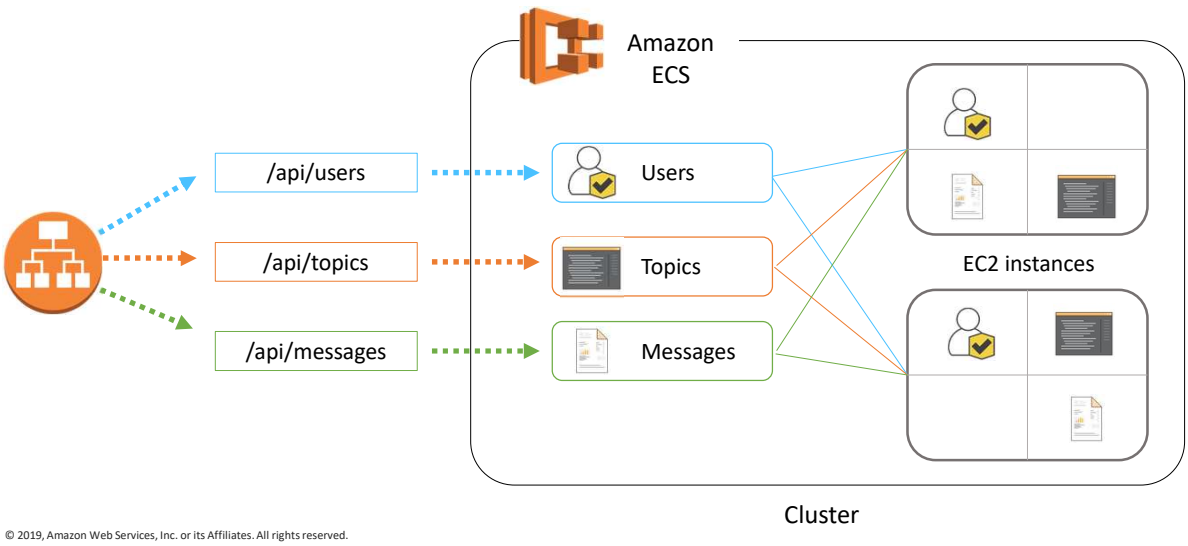
13

Monolithic Application to Container-Based Microservices



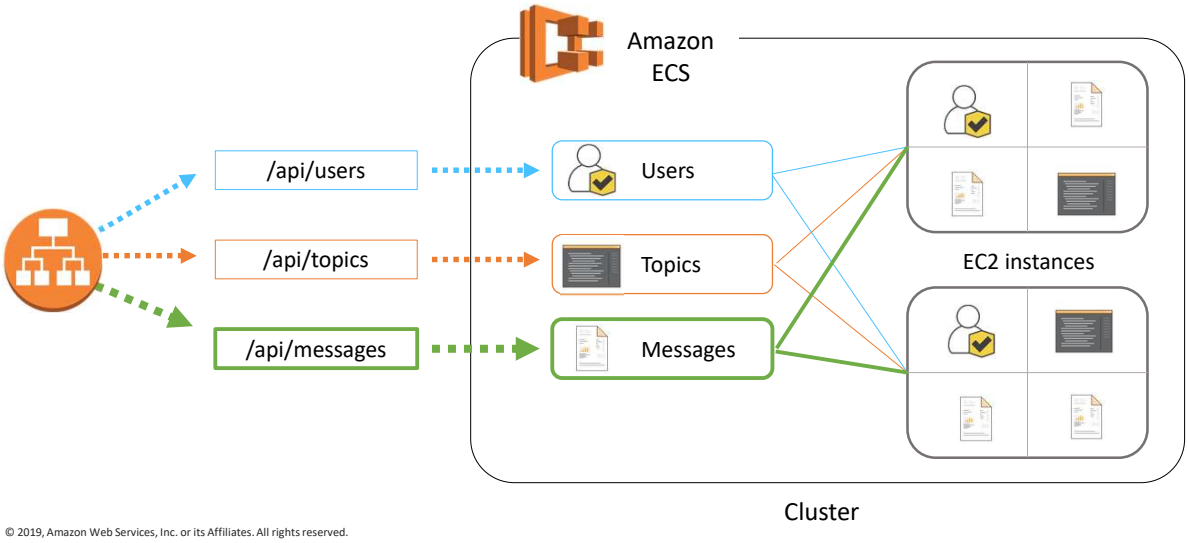
14

Monolithic to Container-Based Microservices



15

Monolithic to Container-Based Microservices



16

AWS Fargate

Fully managed container service

- Provisioning and managing clusters
- Management of runtime environment
- Scaling

17

aws training and certification

Going Serverless

18

Is Your Architecture Efficient?

aws training and certification

Are you using whole instances to support services that perform only one function?

19

Is Your Architecture Efficient?

aws training and certification

Are you using whole instances to support services that perform only one function?

Leveraging other services to manage:

HA and FT

Monitoring fleet health

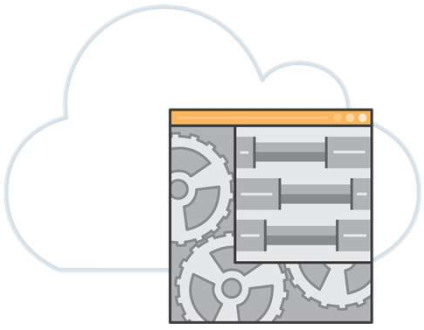
Capacity

20

What is Serverless Computing?

aws training and certification

Building and running apps and services without managing servers



21

AWS Lambda

- Fully managed compute service
- Runs stateless code
- Supports Node.js, Java, Python, C# , Go, and Ruby
- Runs your code on a schedule or in response to events (e.g., changes to data in an Amazon S3 bucket or an Amazon DynamoDB table)
- Can run at the edge

22

AWS Lambda – How it Works

23

AWS Lambda – Event Sources

aws training and certification

Amazon S3

DynamoDB

Amazon SNS

Amazon SQS

CloudWatch Events

Target Group (ALB)

AWS IOT Button

Many more…

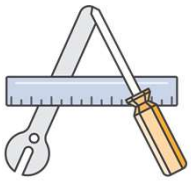
AWS Lambda function

Executes your instructions up to 15 minutes long

24

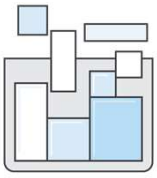
Benefits of Serverless Computing

aws training and certification



Focus on your application, not configuration

Use compute resources only upon request



Build a microservice architecture

25

AWS Lambda

aws training and certification

AWS Lambda handles:

- Servers
- Capacity needs
- Deployment
- Scaling and fault tolerance
- OS or language updates
- Metrics and logging

26

AWS Lambda

aws training and certification

AWS Lambda handles:

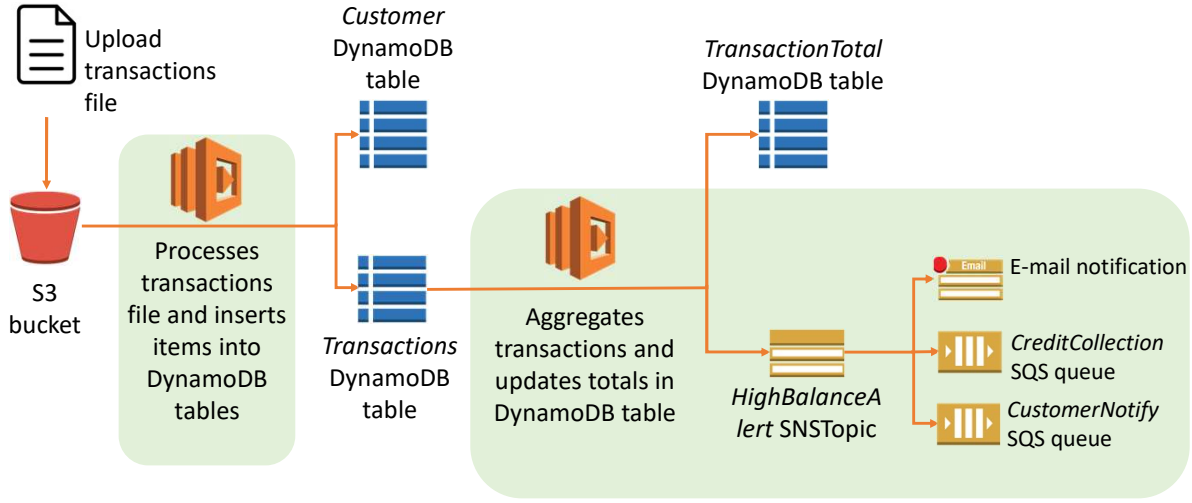
- Servers
- Capacity needs
- Deployment
- Scaling and fault tolerance
- OS or language updates
- Metrics and logging

AWS Lambda enables you to:

- Bring your own code (even native libraries)
- Run code in parallel
- Create back ends, event handlers, and data processing systems
- Never pay for idling resources

27

Example: Amazon S3 and AWS Lambda For Order Processing



28

Lab-M12-01: Implementing a Serverless Architecture with AWS Managed Services

29

Lab-M12-01: Implementing a Serverless Architecture

aws training and certification

"I want a reliable, scalable, low-cost application built for the cloud."

Technologies used:

- AWS Lambda
- Amazon SNS
- Amazon DynamoDB
- Amazon S3

30

Lab-M12-01: Implementing a Serverless Architecture

aws training and certification

Scenario

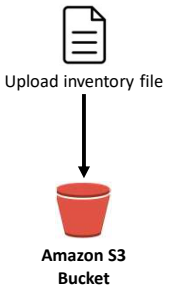
- Stores upload inventory files
- Monitor inventory levels via a dashboard
- Notify inventory managers when an item is *out of stock*

31

Lab-M12-01: Implementing a Serverless Architecture

aws training and certification

A CSV inventory file is uploaded to Amazon S3



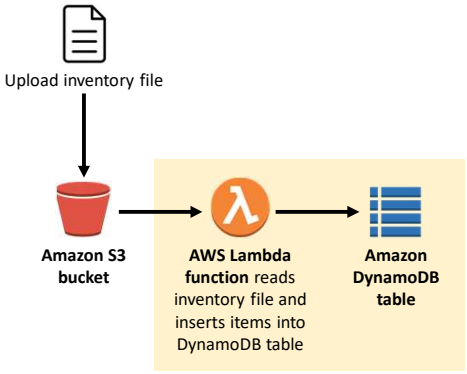

```
store,item,count
Berlin,Echo Dot,12
Berlin,Echo (2nd Gen),19
Berlin,Echo Show,18
Berlin,Echo Plus,0
Berlin,Echo Look,10
Berlin,Amazon Tap,15
```


32

Lab-M12-01: Implementing a Serverless Architecture

aws training and certification

An AWS Lambda function loads file contents into a DynamoDB table

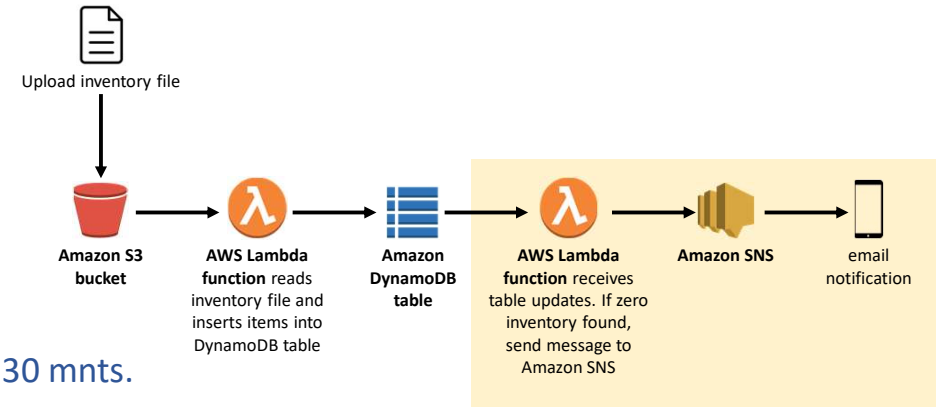


33

Lab-M12-01: Implementing a Serverless Architecture

aws training and certification

A second Lambda function sends notifications when an item is out of stock



Duration: 30 mnts.

34

aws training and certification

Thank You

35