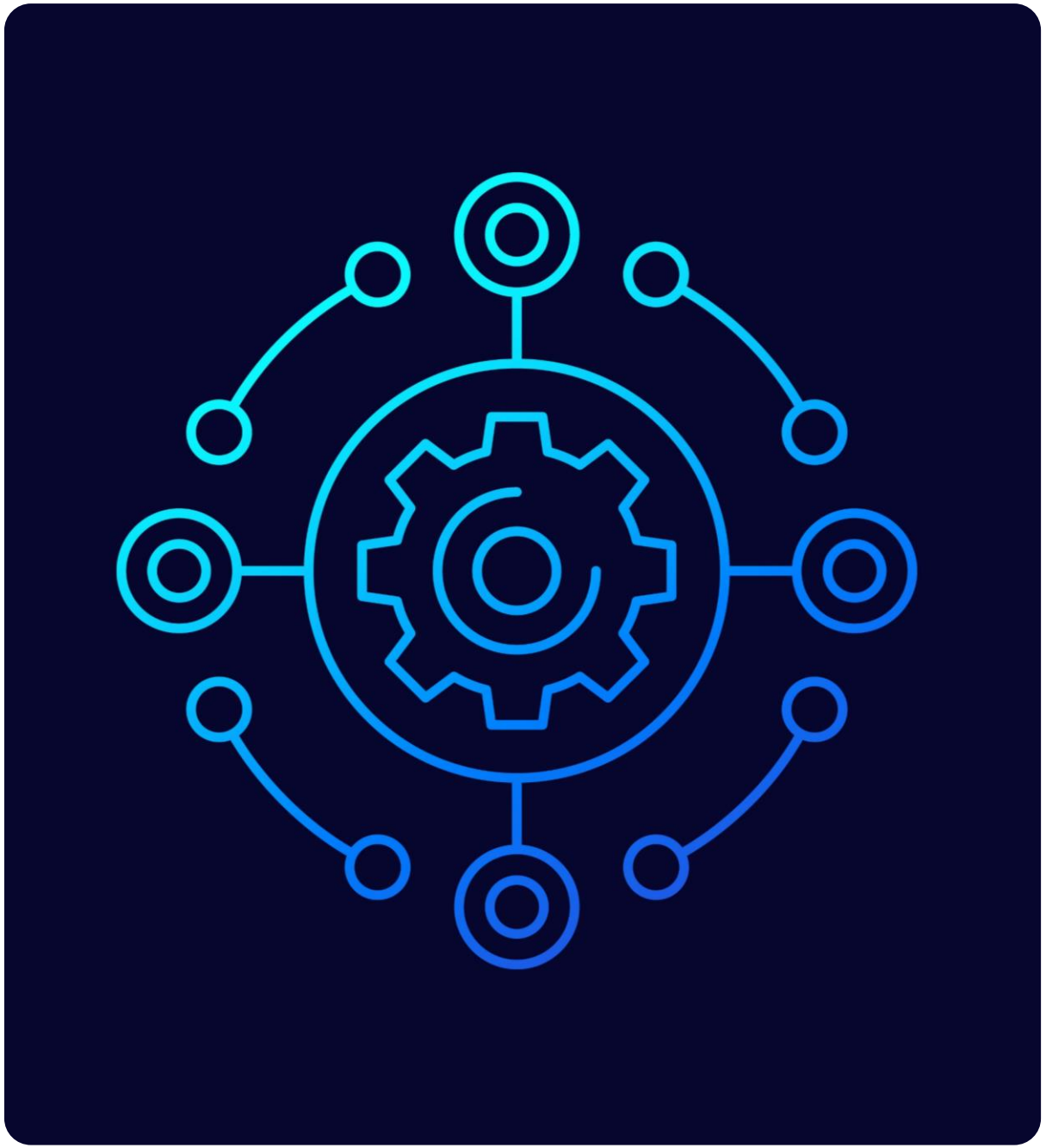
BeSA

Week 8

25th June, 2022

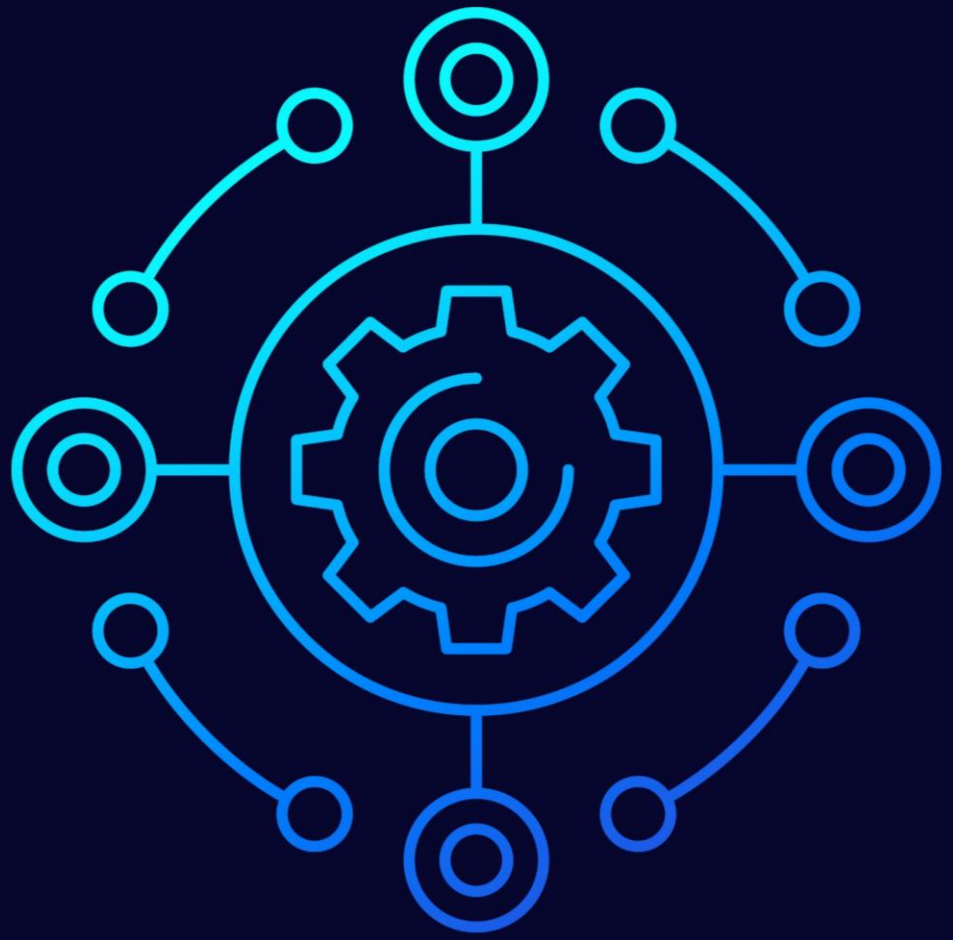


Agenda

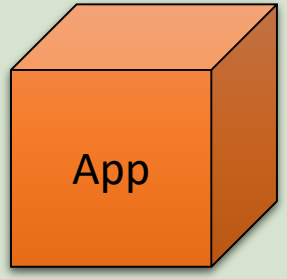
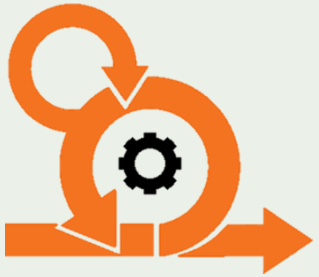
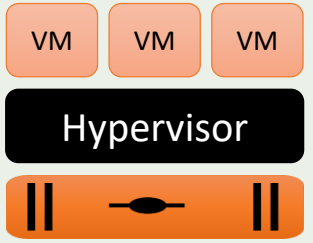
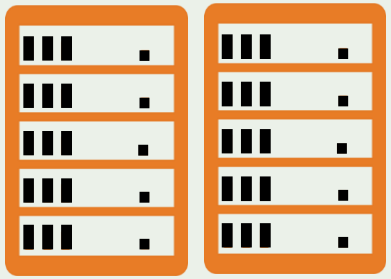
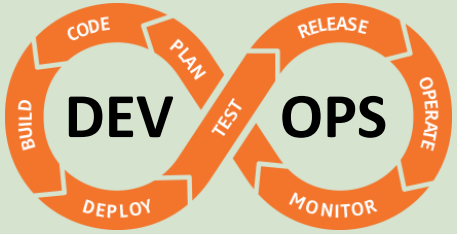
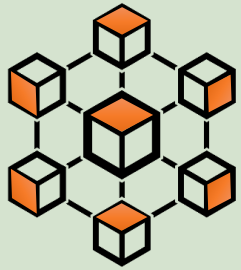
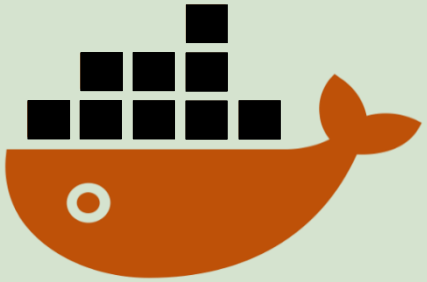
1. Microservices and Serverless

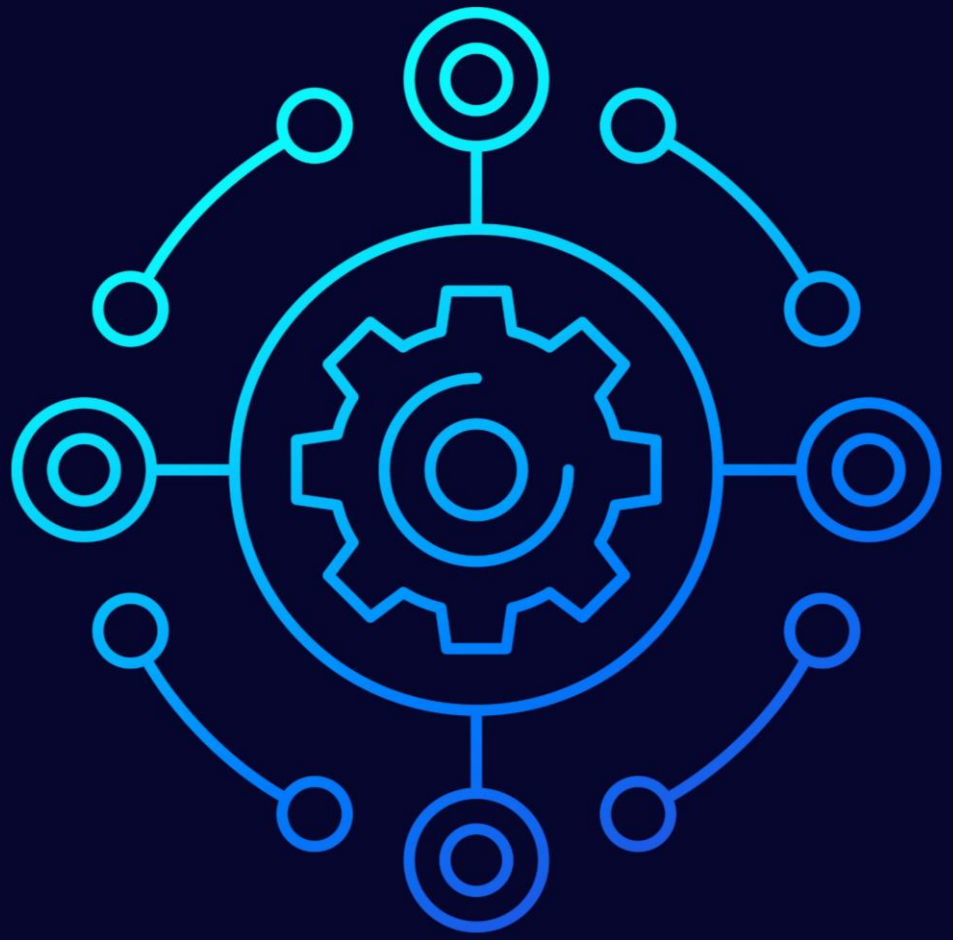
2. Microservices - The Hard Parts
   - James

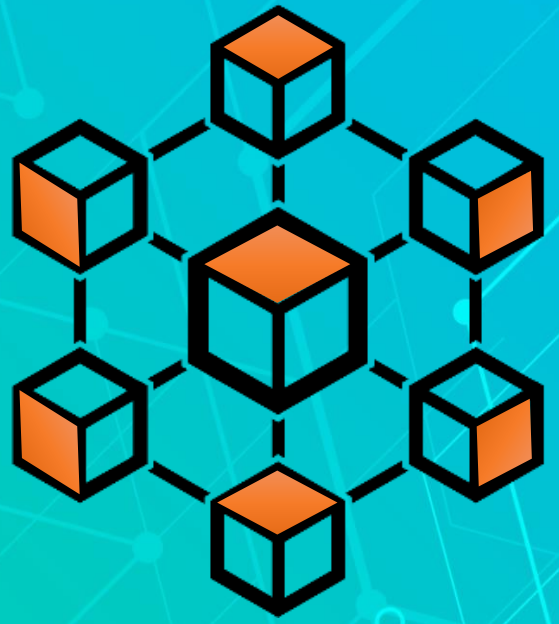
3. You are a Solutions Architect and a start-up has asked your guidance on which database to choose. What will you advise?
   - Prasad



How applications evolved?

TimeLine	Development Process	Application Architecture	Deployment & Packaging	Application Hosting Infrastructure
1980 to 2000	 Waterfall	 Monolithic	 Physical Server	 Datacenter
2000 to 2010	 Agile	 N-Tier	 Virtual Servers	 Hosted
2010 to Current	 DevOps	 Microservices	 Containers	 Cloud





Monolith vs Microservices

A food stall vs. a Pizza place

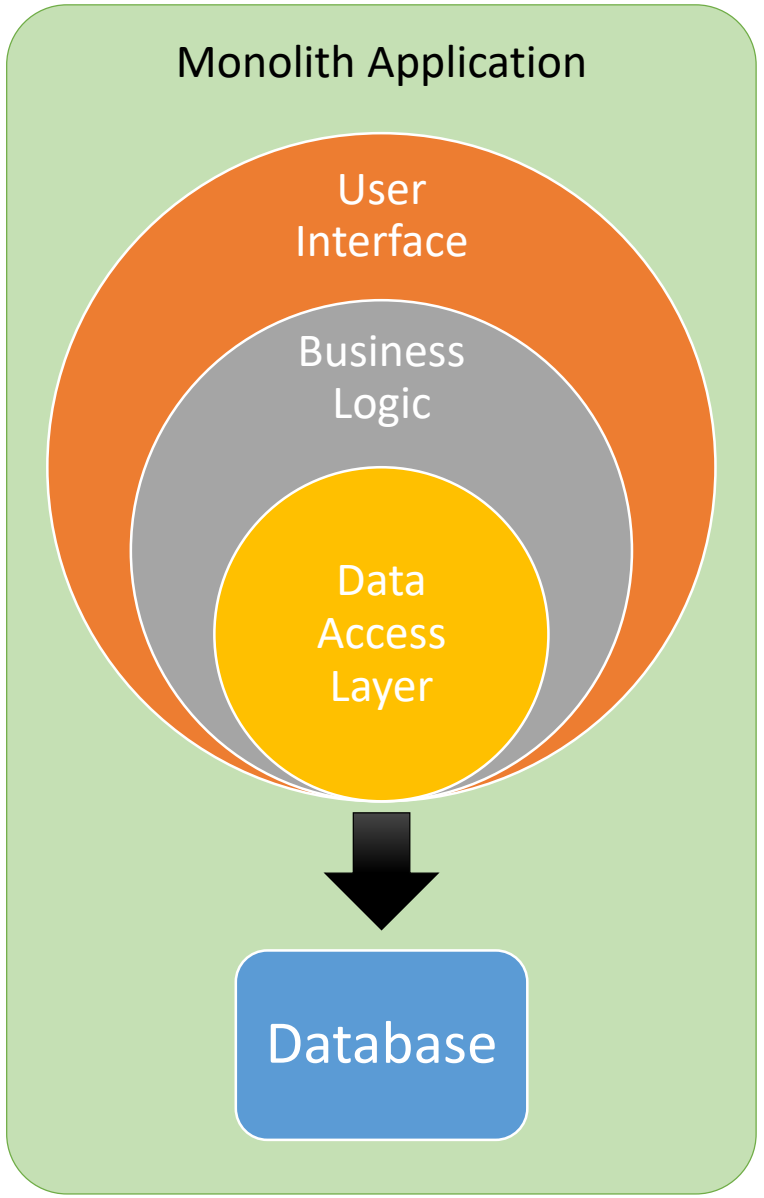
VS.

A food stall vs. a fine dining restaurant

VS.

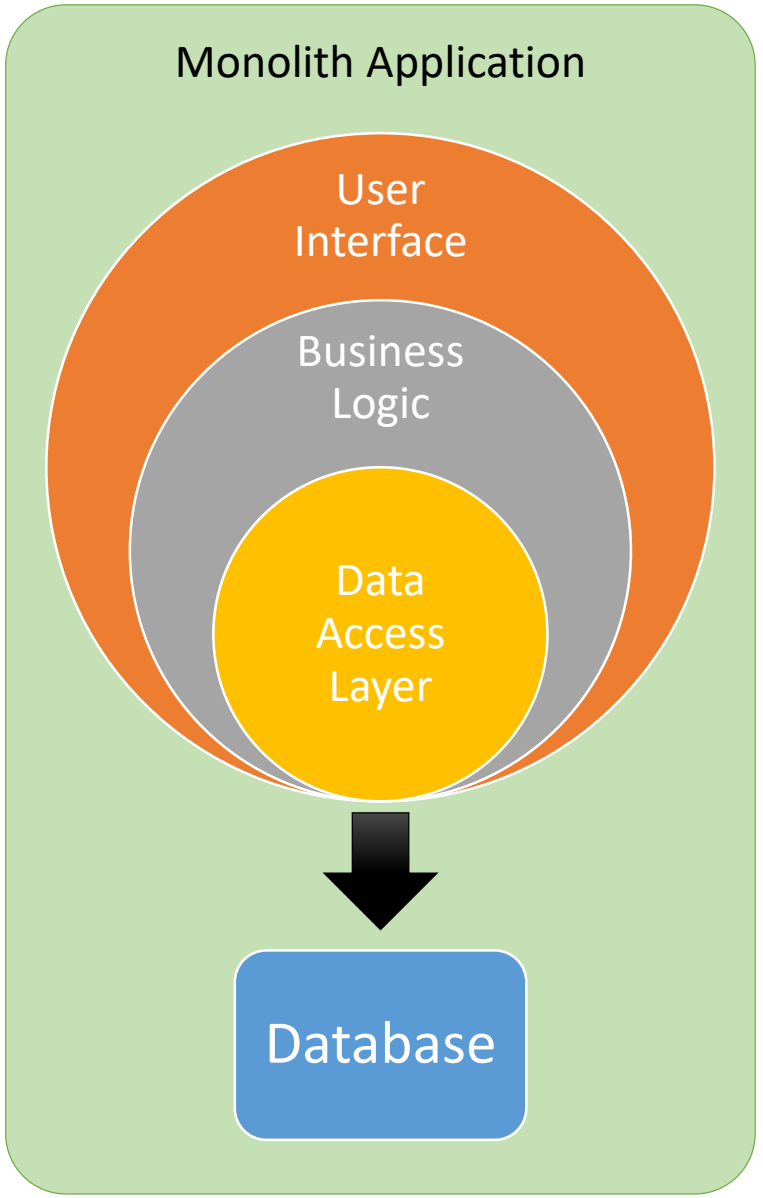
What is a Monolith Application?

- One large system and is usually one code-base
- Built as a single and indivisible unit
- Designed without modularity
- Deployed all at once
- Components depend on each other to work



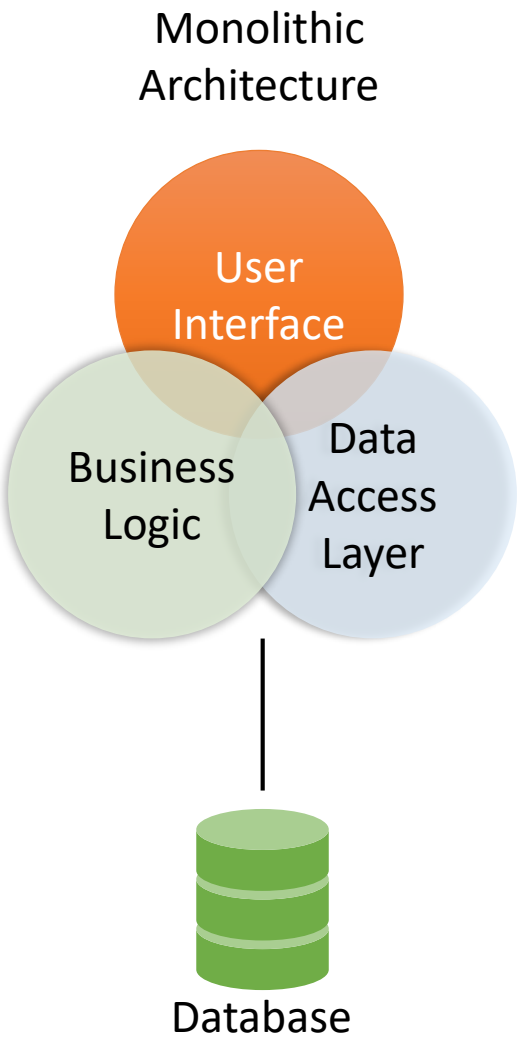
Monolith Challenges

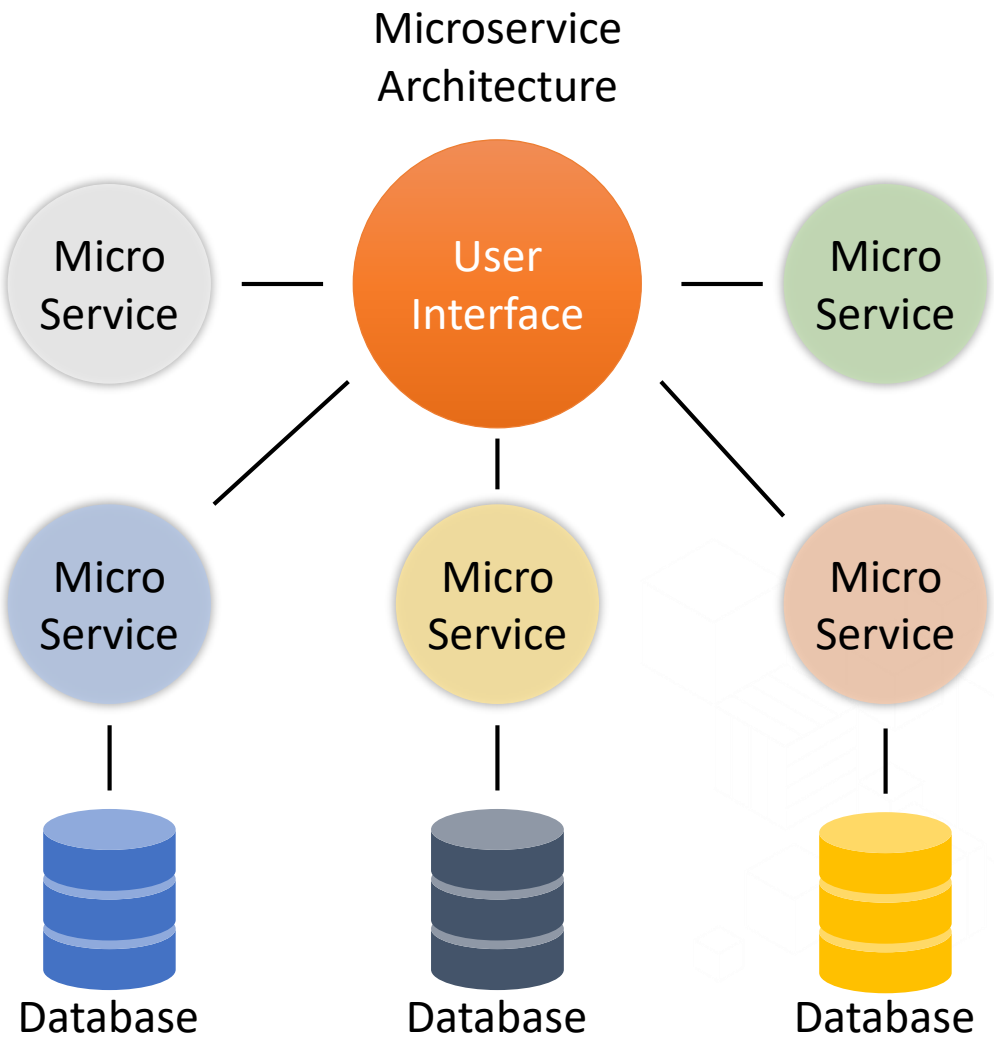
- Barrier to adopting new technologies
- Continuous deployment is difficult
- Complex / large code base
- Difficult to scale
- Difficult to maintain



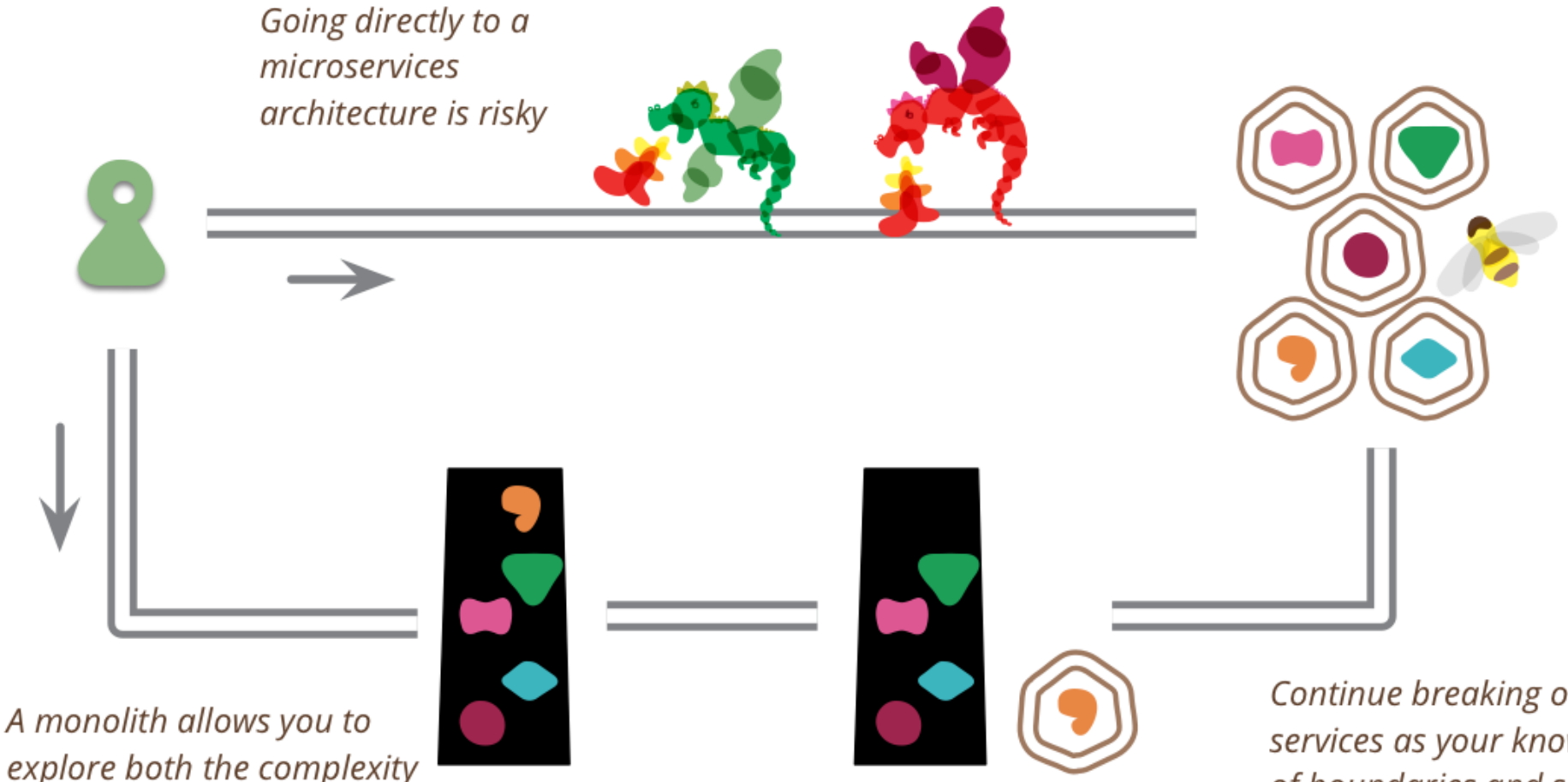
What Are Microservices?

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





MonolithFirst Approach

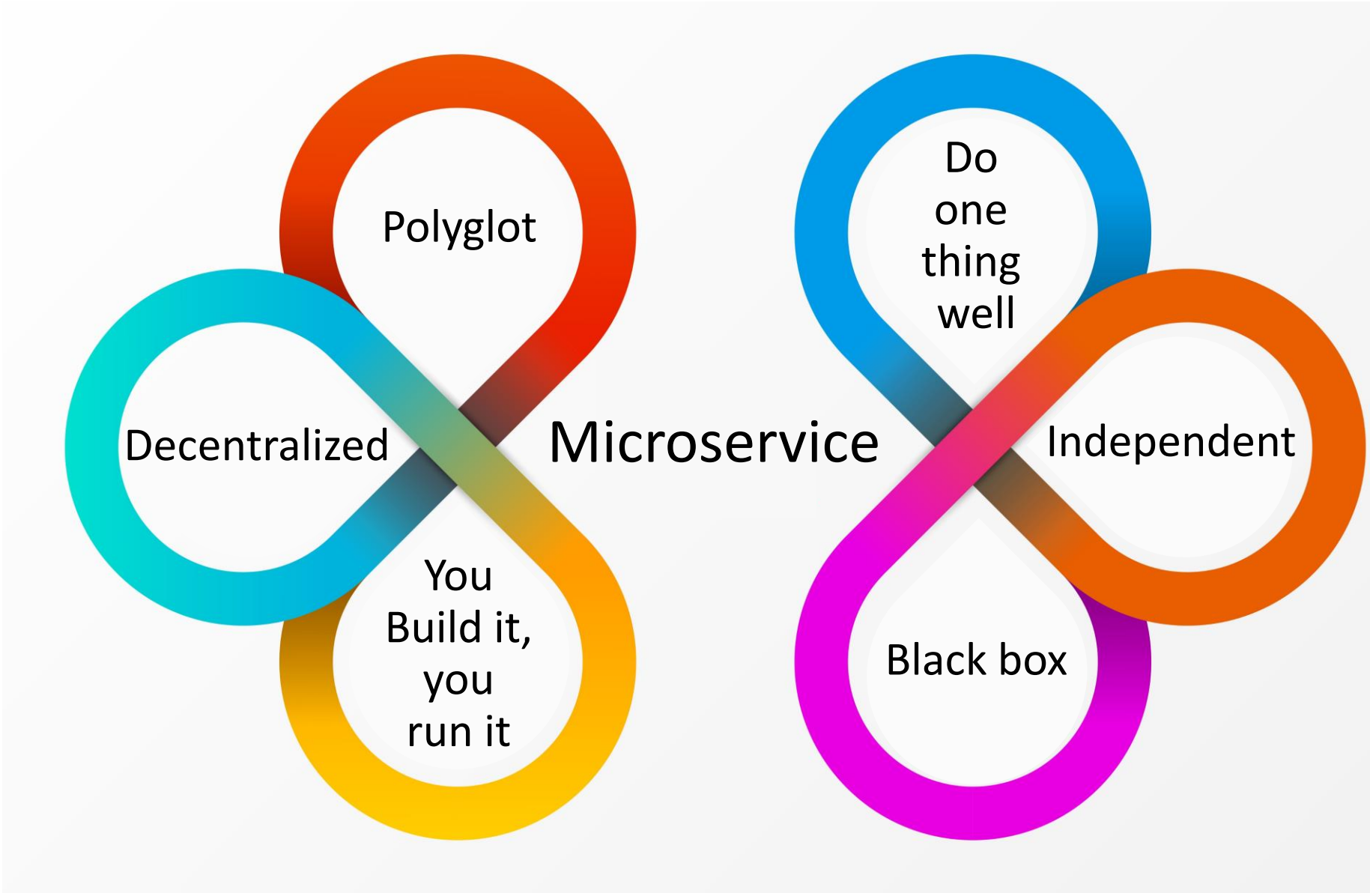


3 June 2015

Martin Fowler

Ref: https://martinfowler.com/bliki/MonolithFirst.html

Characteristics of a Microservice



Do you see anything common in these wheels?

The interface is same

So any wheel can be attached

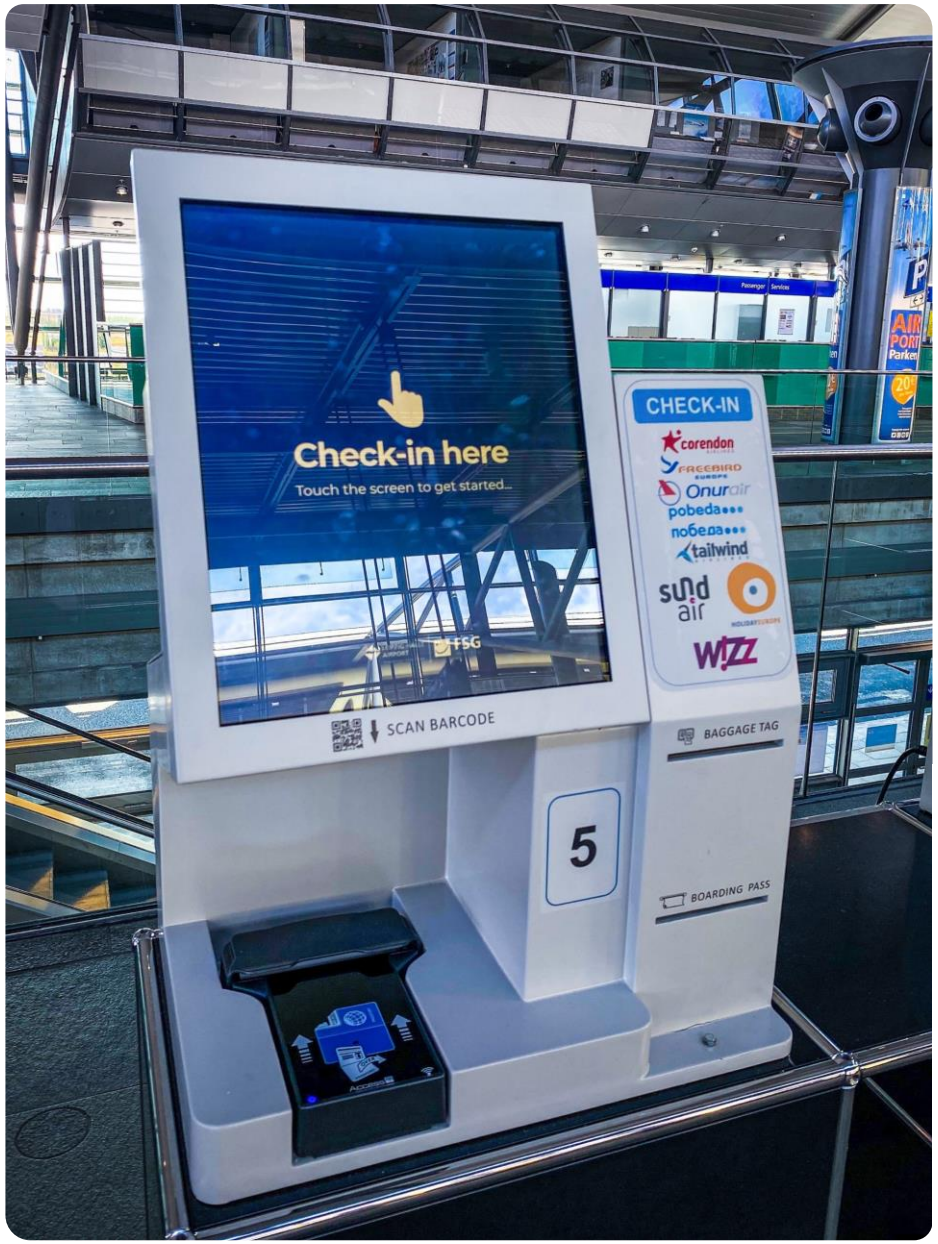
BeSA
Become a Solutions Architect

Serverless Architecture

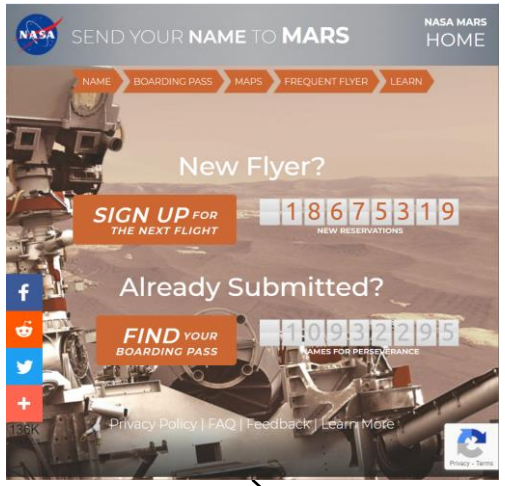
AWS Lambda

Amazon API Gateway

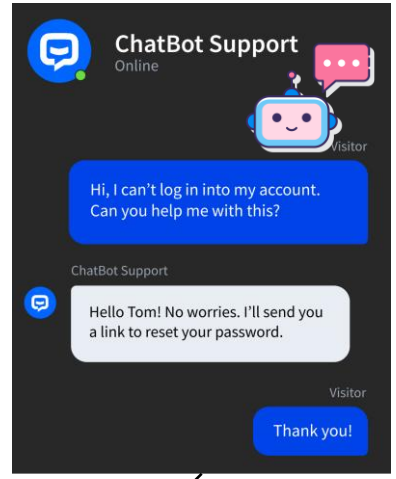
Why serverless?



Web Applications



ChatBots



24 x 7
Operations

24 x 7 Running Backend
Executes some code

- Mostly idle
- Costing Money
- Operational overhead

Some Serverless Services on AWS

Compute

AWS Lambda

AWS Fargate

API Proxy

Amazon API Gateway

Database

Amazon DynamoDB

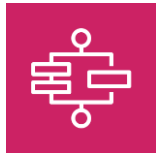
Amazon Aurora

Inter-process Messaging

Amazon SNS

Amazon SQS

Orchestration



AWS Step Functions

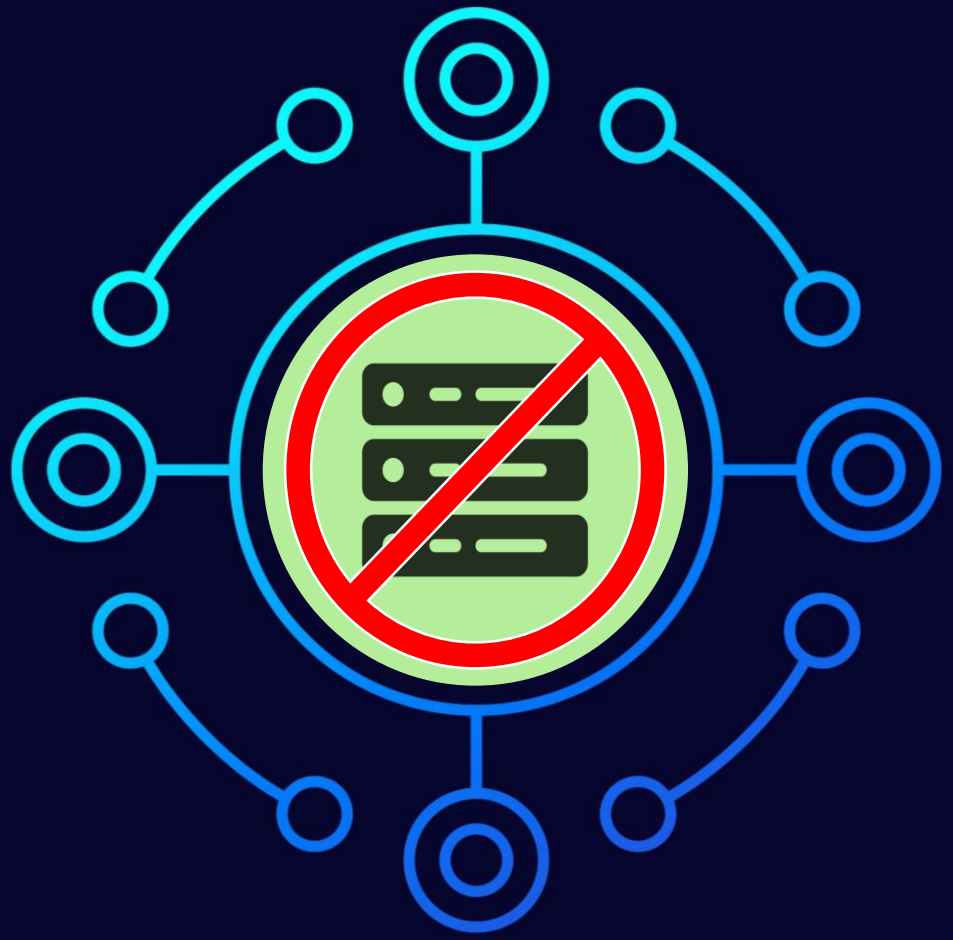
Storage

Amazon S3

Analytics

Amazon Kinesis

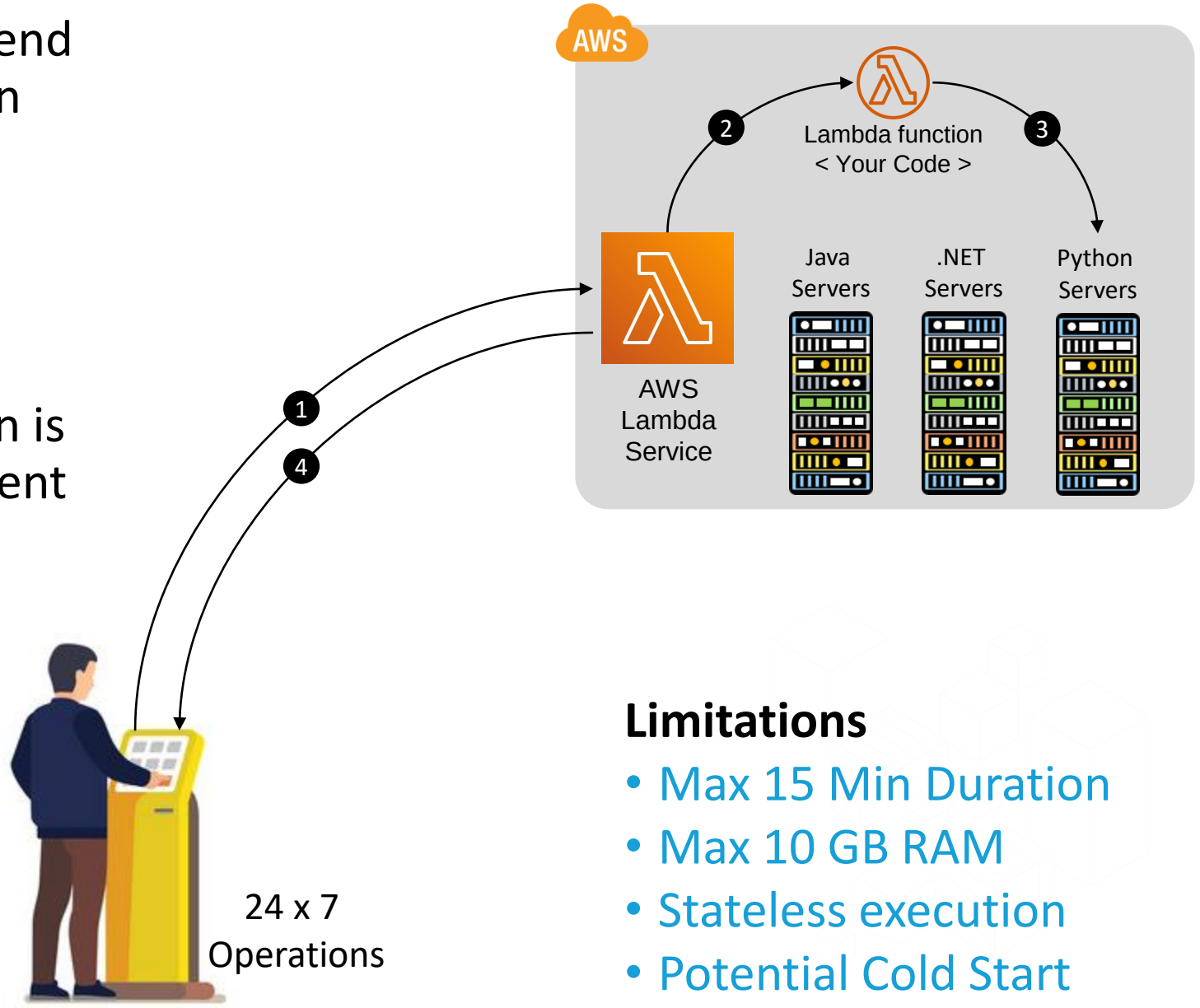
Amazon Athena



AWS Lambda

How AWS Lambda works?

1. An event is triggered from frontend (Click / API Call / Fingerprint scan etc.)
2. AWS Lambda Service receives invocation call and triggers corresponding Lambda function
3. Code inside the Lambda function is executed in a suitable environment
4. (Optional) Results are delivered back to the frontend



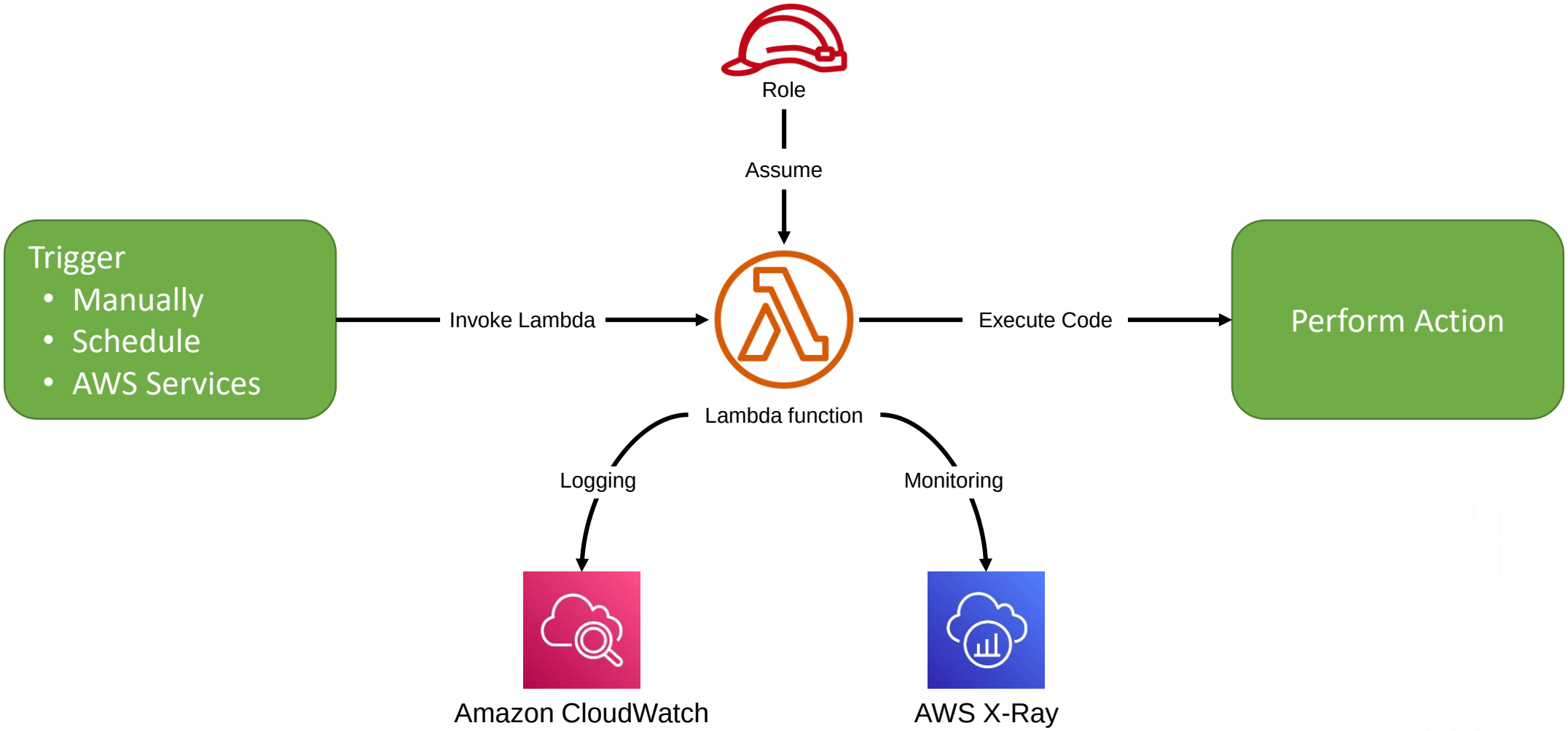
Advantages

- No servers to mange
- Millisecond billing
- Automatic scaling
- Rich ecosystem

Limitations

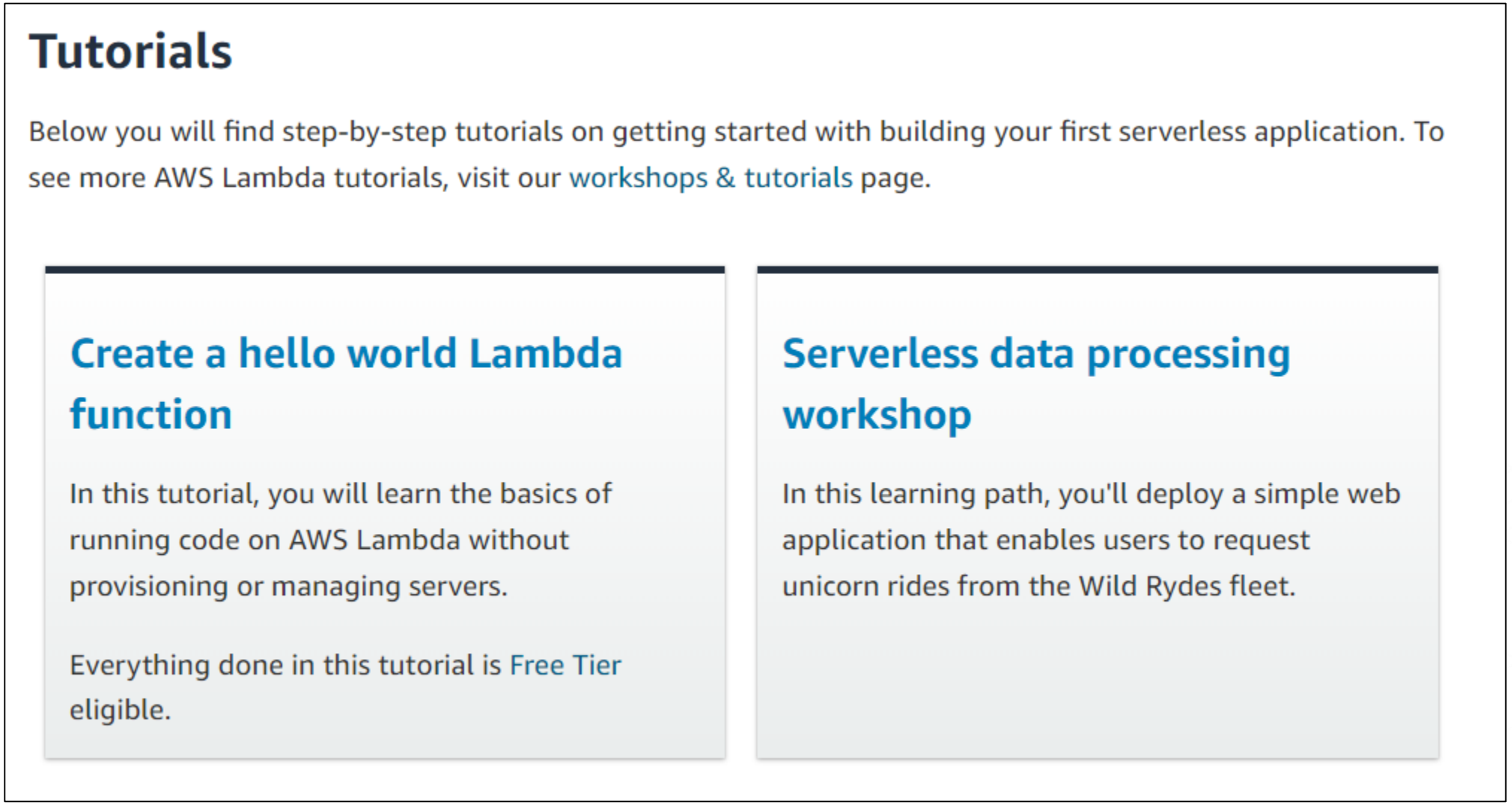
- Max 15 Min Duration
- Max 10 GB RAM
- Stateless execution
- Potential Cold Start

AWS Lambda Function Execution



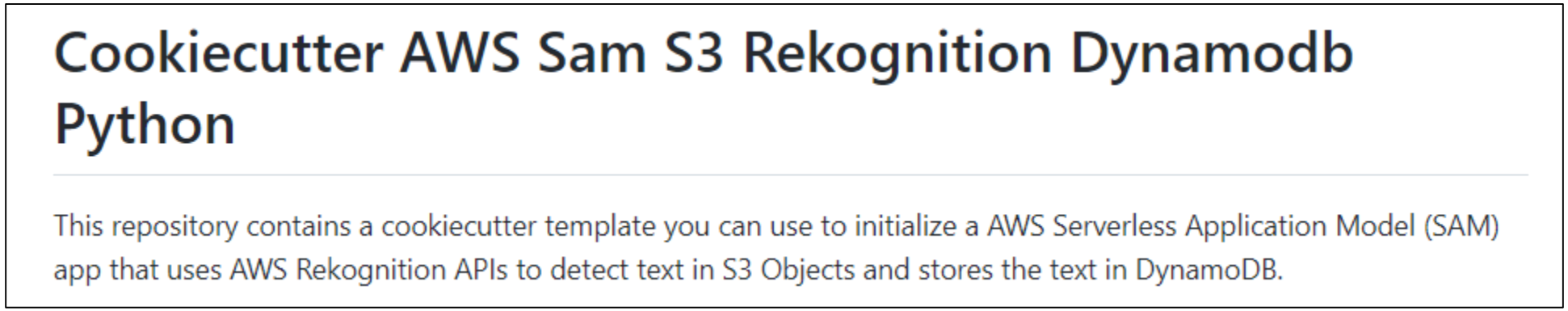
Lambda Resources

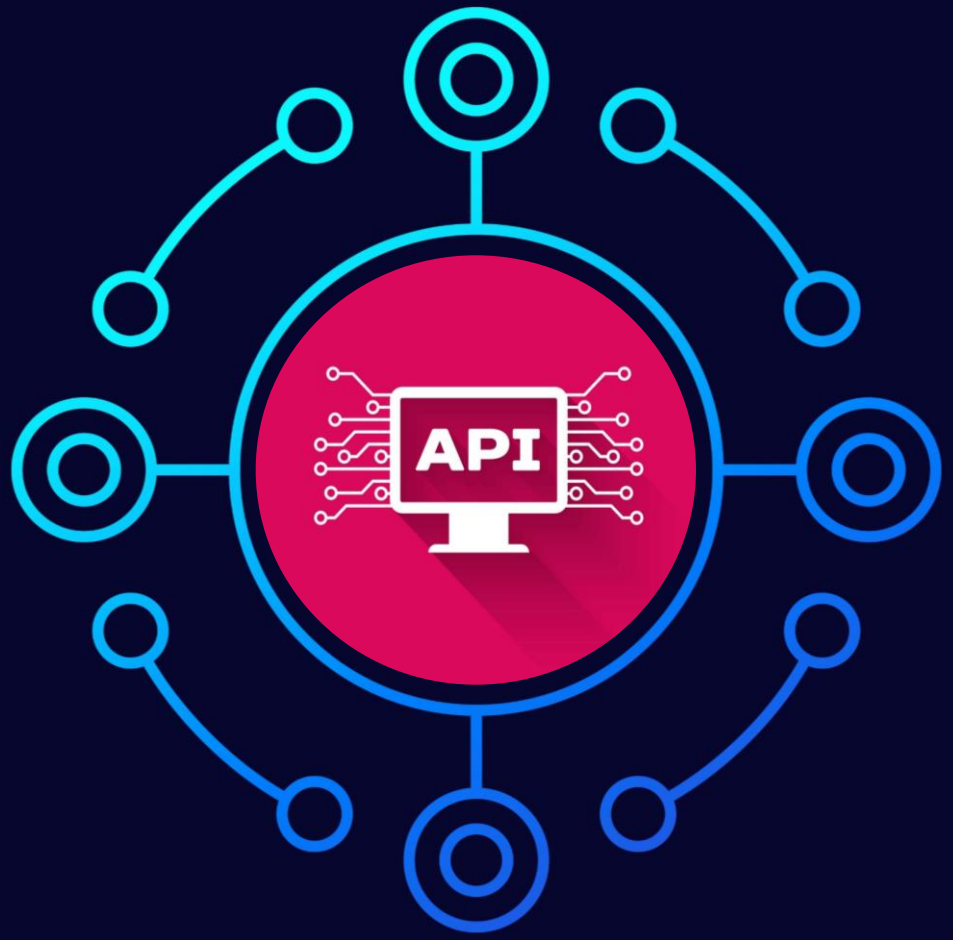
- https://aws.amazon.com/lambda/resources



Deploying it through SAM

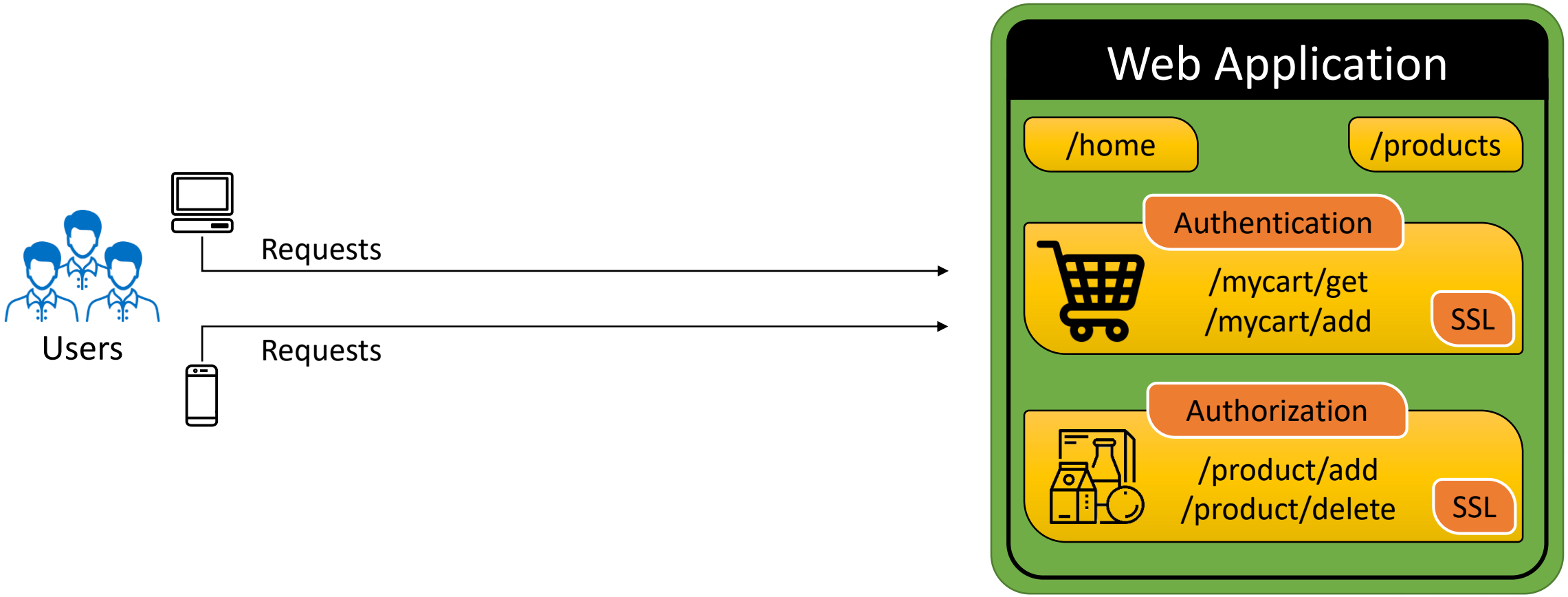
- https://github.com/aws-samples/cookiecutter-aws-sam-s3-rekognition-dynamodb-python



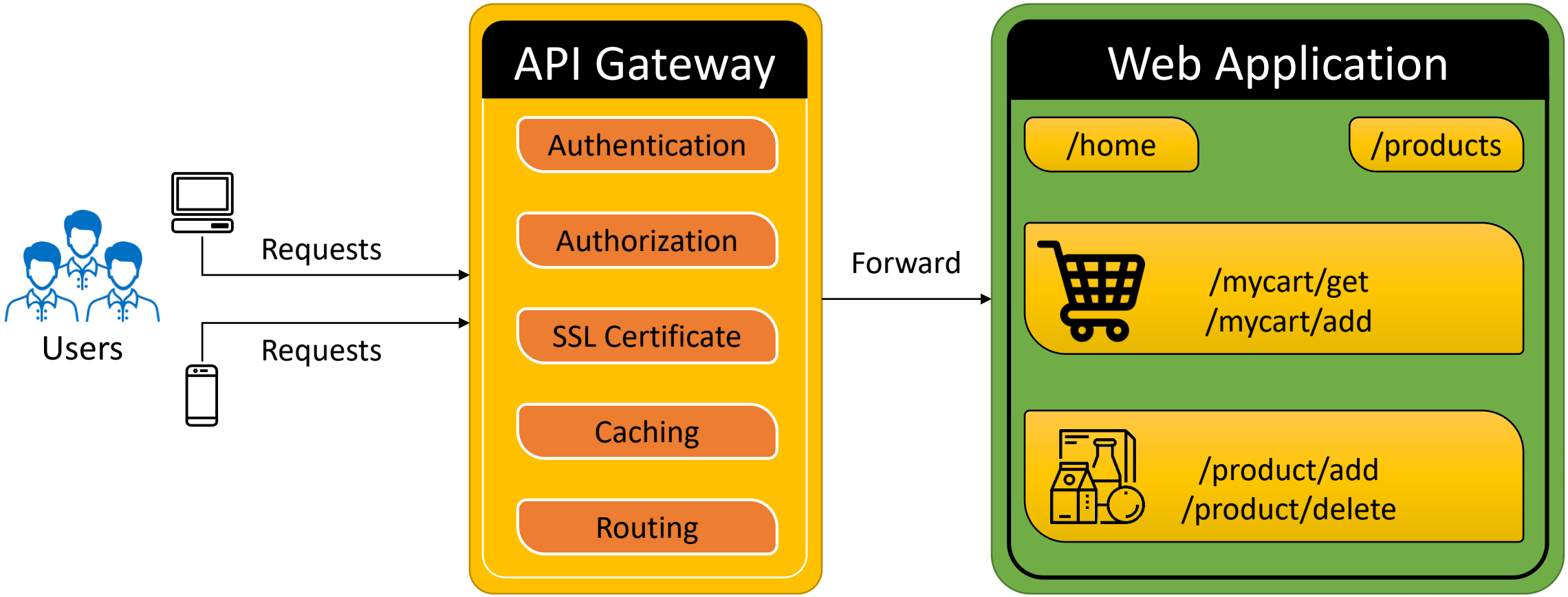


Amazon API Gateway

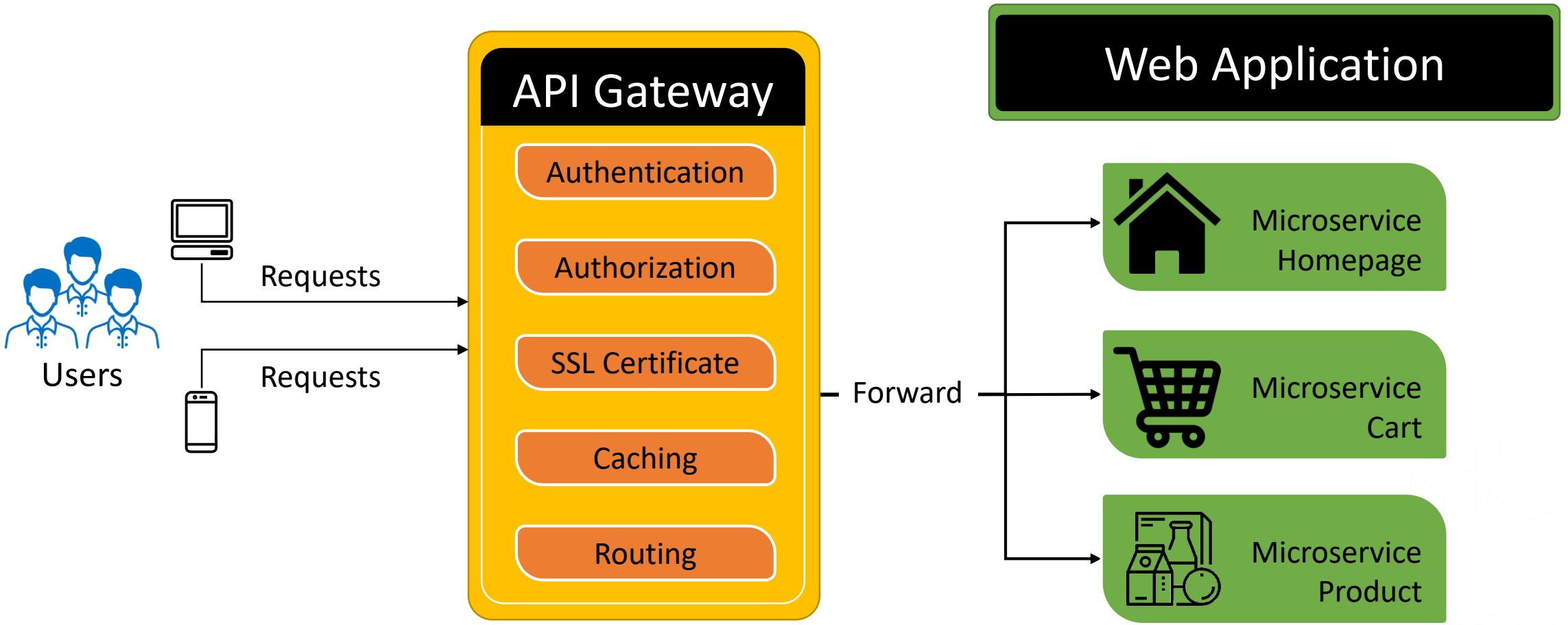
E-Commerce Application



E-Commerce Application with API Gateway



E-Commerce Application with API Gateway using Microservices

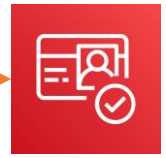


AWS Project - Build a Serverless Web Application

HTML, CSS, JavaScript

S3 Bucket
Static Content

Authentication



Amazon
Cognito

Dynamic Content
API Calls

Amazon API
Gateway

AWS Lambda

Amazon
DynamoDB

Thank you for attending. See you next Saturday (2-July-2022)

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Become a Solutions Architect

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