AWS Lambda & API Gateway

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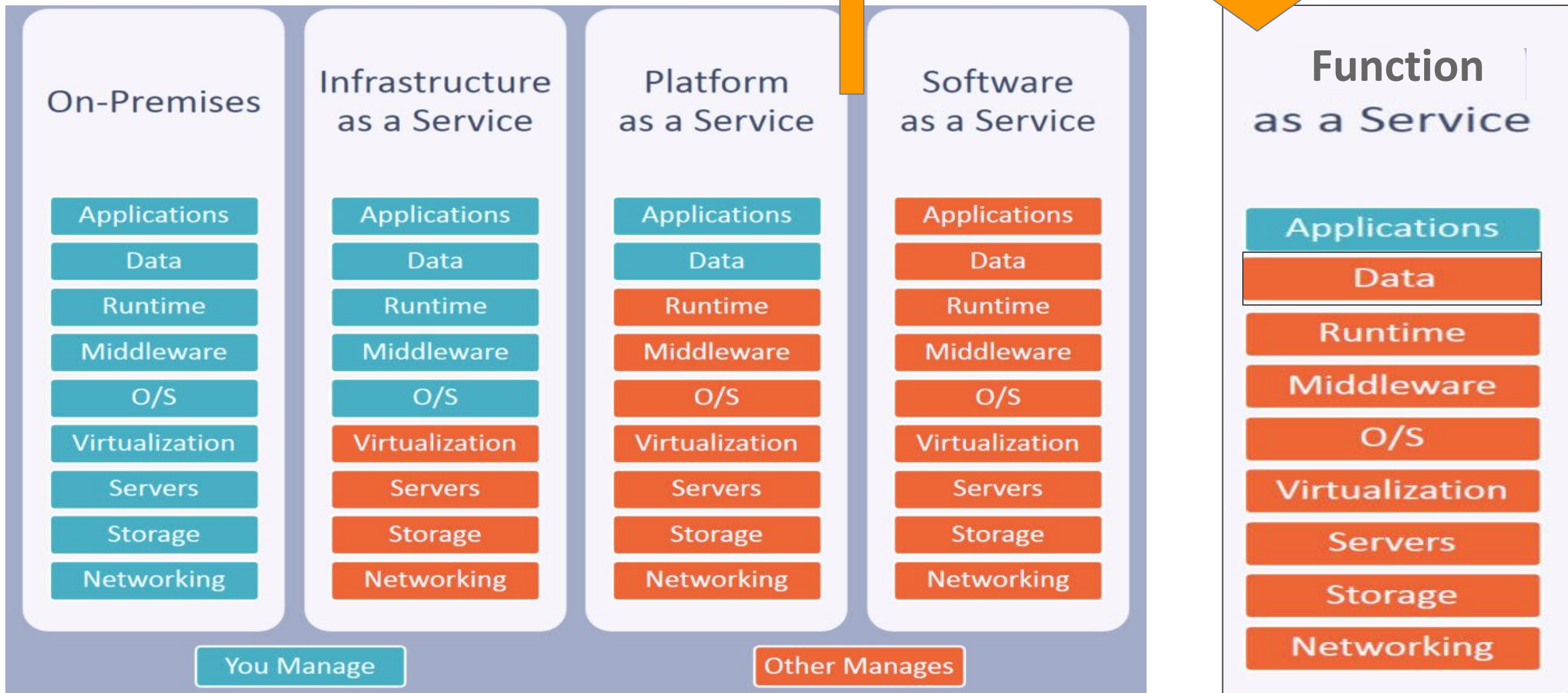
1 Introduction to Serverless
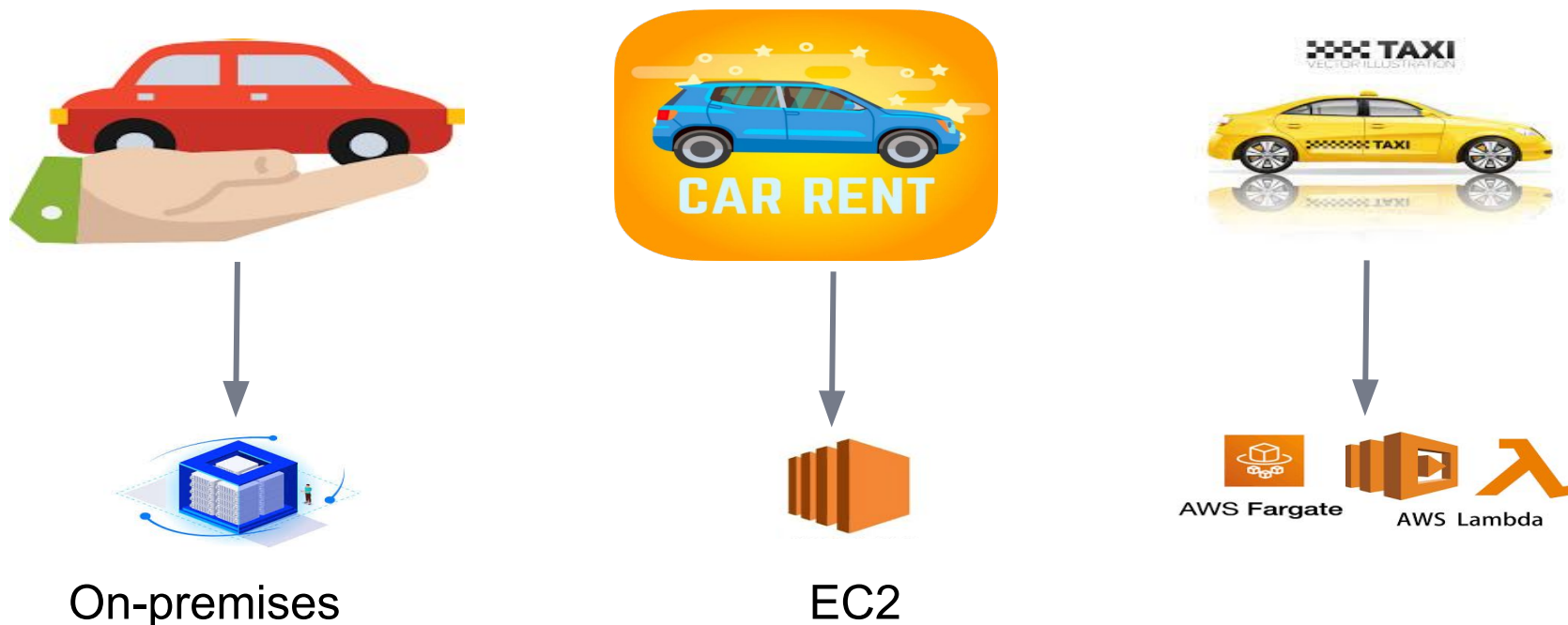
Introduction to Serverless

What is Serverless?

What is Serverless?

On-premises

EC2

Serverless is a cloud-native development model that allows developers to build and run applications without having to manage servers.

There are still servers in serverless, but they are abstracted away from app development. A cloud provider handles the routine work of provisioning, maintaining, and scaling the server infrastructure. Developers can simply package their code in containers for deployment.

Introduction to Serverless Infrastructure
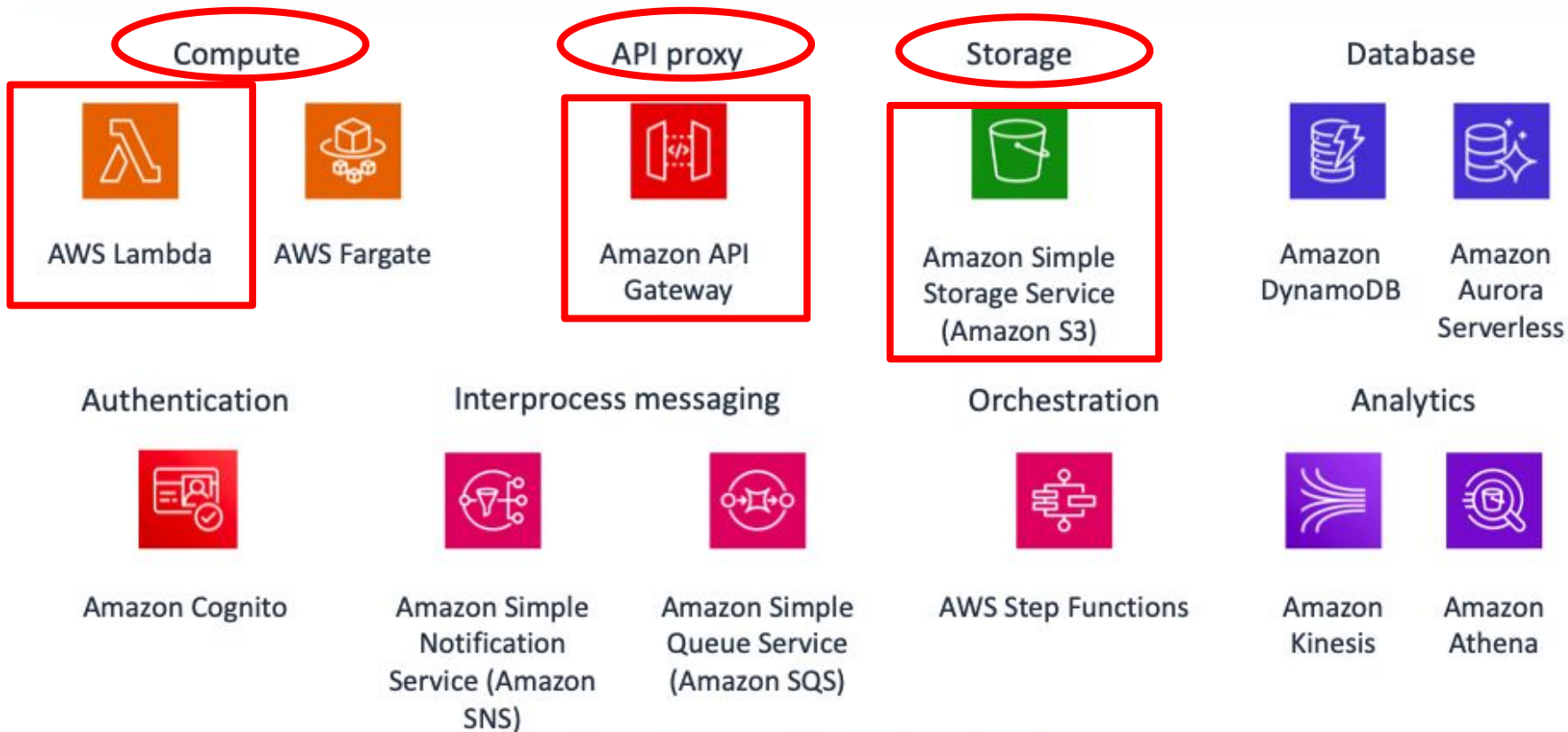## What is Serverless Infrastructure and Why?

- Run applications **without servers.**

- **Eliminate infrastructure management**

- Cost effective

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Introduction to Serverless Infrastructure

AWS serverless portfolio

Compute	API proxy	Storage	Database
AWS Lambda	Amazon API Gateway	Amazon Simple Storage Service (Amazon S3)	Amazon DynamoDB
AWS Fargate			Amazon Aurora Serverless

| Authentication	Interprocess messaging	Orchestration	Analytics
Amazon Cognito	Amazon Simple Notification Service (Amazon SNS)	AWS Step Functions	Amazon Kinesis
	Amazon Simple Queue Service (Amazon SQS)		Amazon Athena

2 AWS Lambda

AWS Lambda
What is Lambda?

- AWS Lambda is the first FaaS service among the global public cloud products.

- It is a serverless compute service that runs your code in response to programmed events.

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AWS Lambda

What is Lambda?
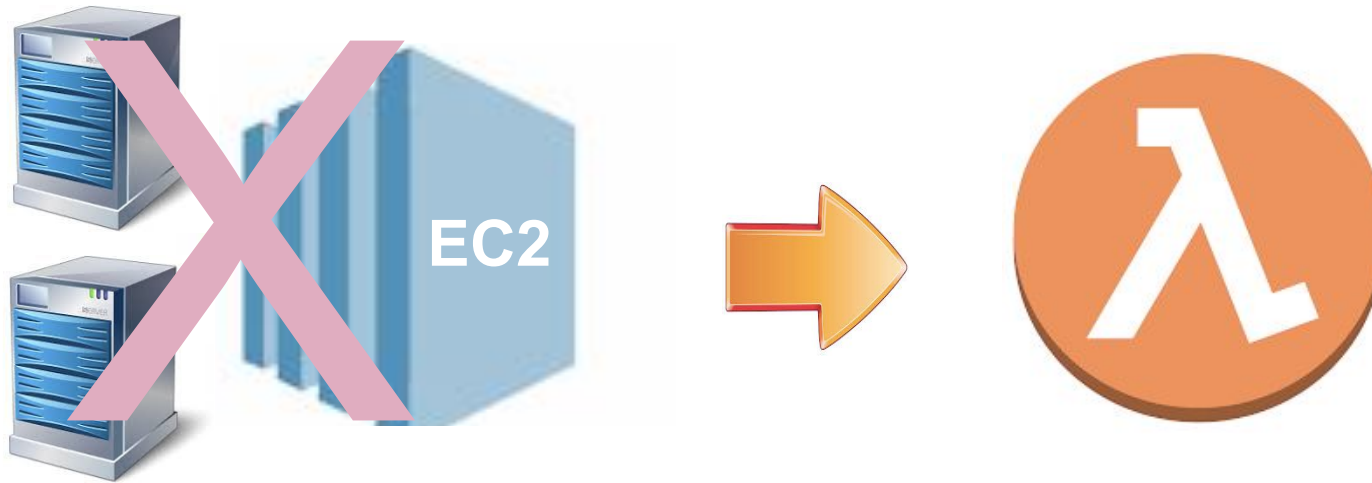
- AWS Lambda lets you run code without provisioning or managing servers

- Instead of launching an EC2 instance to run your code on it, you can just deploy your code in Lambda services and you can get the same result.

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AWS Lambda

How Lambda function works?

| 1 | 2 | 3 | 4 |

Photograph is taken

Amazon S3
Photo is uploaded to an S3 Bucket

Lambda is triggered

AWS Lambda
Lambda runs
"Image Resizing Code"

Photo is resized into web, mobile, and tablet sizes

LAMBDA FUNCTION CAN BE **TRIGGERED BY ANOTHER ACTION.**

LAMBDA IS ACTIVE **AS LONG AS APPLICATION CODE WORKS**. THAT'S **WHY WE SAY IT IS COST EFFECTIVE**.

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AWS Lambda

Exactly pay as you go

- **EC2:** You will be charged as long as your instance is running even if your code runs or not.

- **Lambda:** You will be only charged when the functions that you deployed are run.
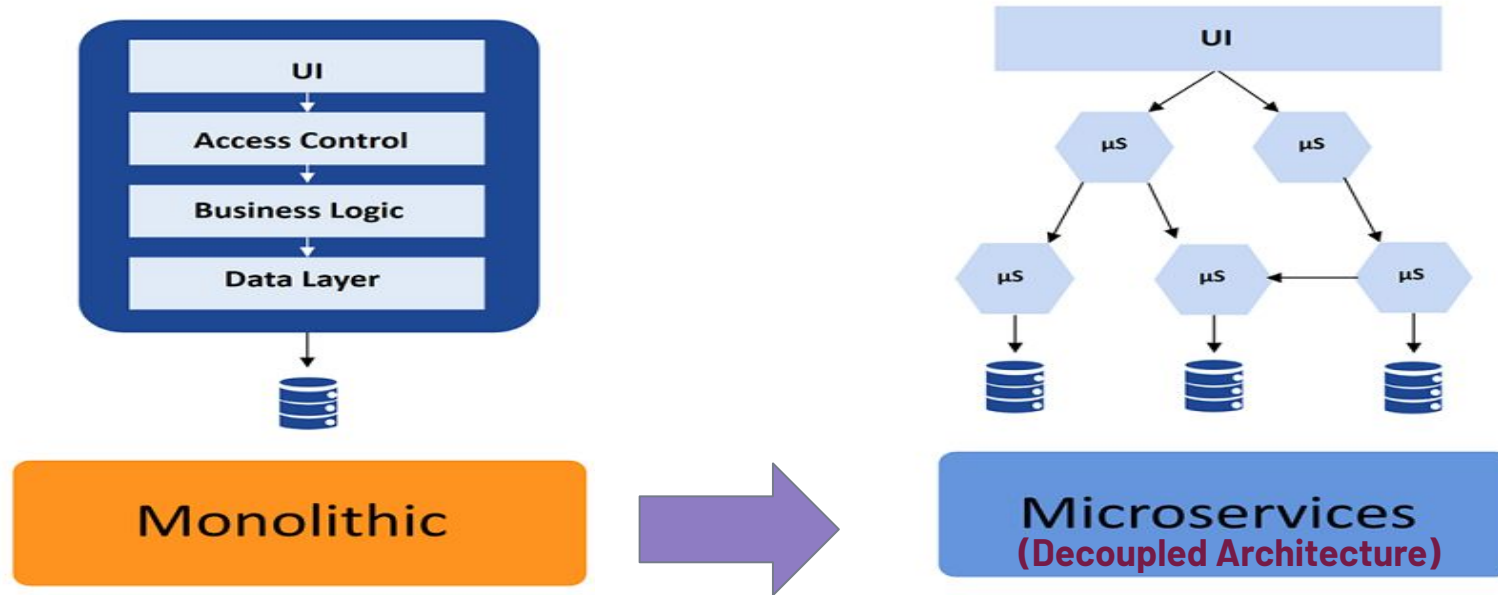
AWS Lambda

Lambda codes

Lambda supports Java, Go, PowerShell, Node.js, C#, Python, and Ruby code.

2 API Gateway
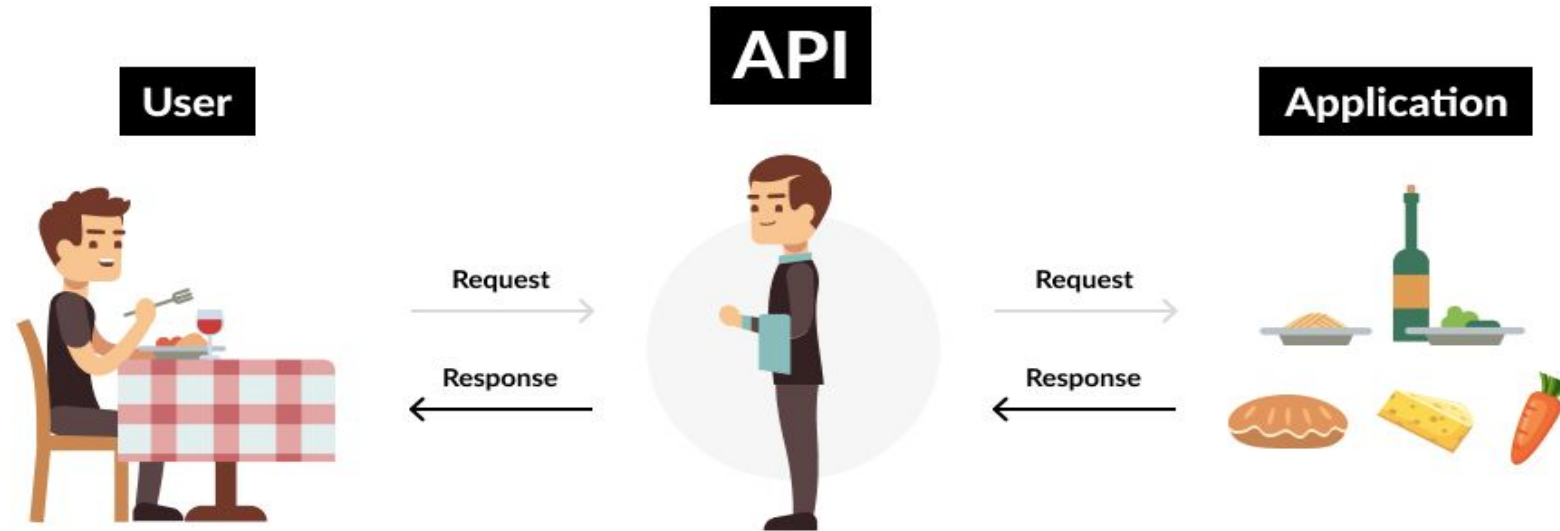
API Gateway

What is an API?

APIs are mechanisms that enable two software components to communicate with each other using a set of definitions and protocols. For example, the weather bureau's software system contains daily weather data. The weather app on your phone "talks" to this system via APIs and shows you daily weather updates on your phone.

What is an API Gateway?

An application programming interface (API) gateway is software that takes an application user's request, routes it to one or more backend services, gathers the appropriate data and delivers it to the user in a single, combined package. It also provides analytics, layers of threat protection and other security for the application.

API Gateway

What is API?

API stands for Application Program Interface. Basically, the API defines how device components can communicate with each other.
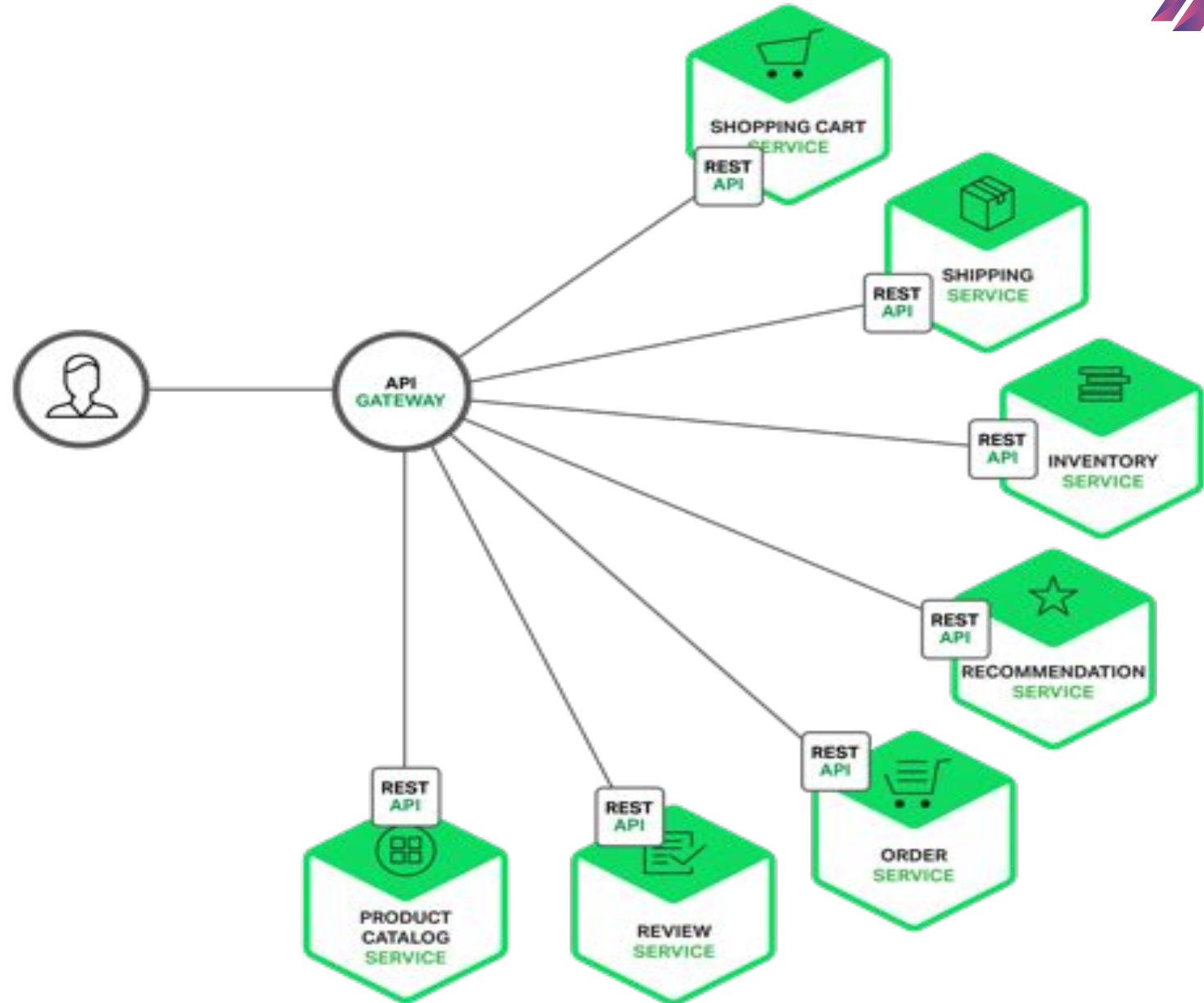
API Gateway

What is API Gateway?

The API Gateway is responsible for routing, design, and interface transfer requests.

In microservices architecture, different API's within the same application might be written in different programing languages.
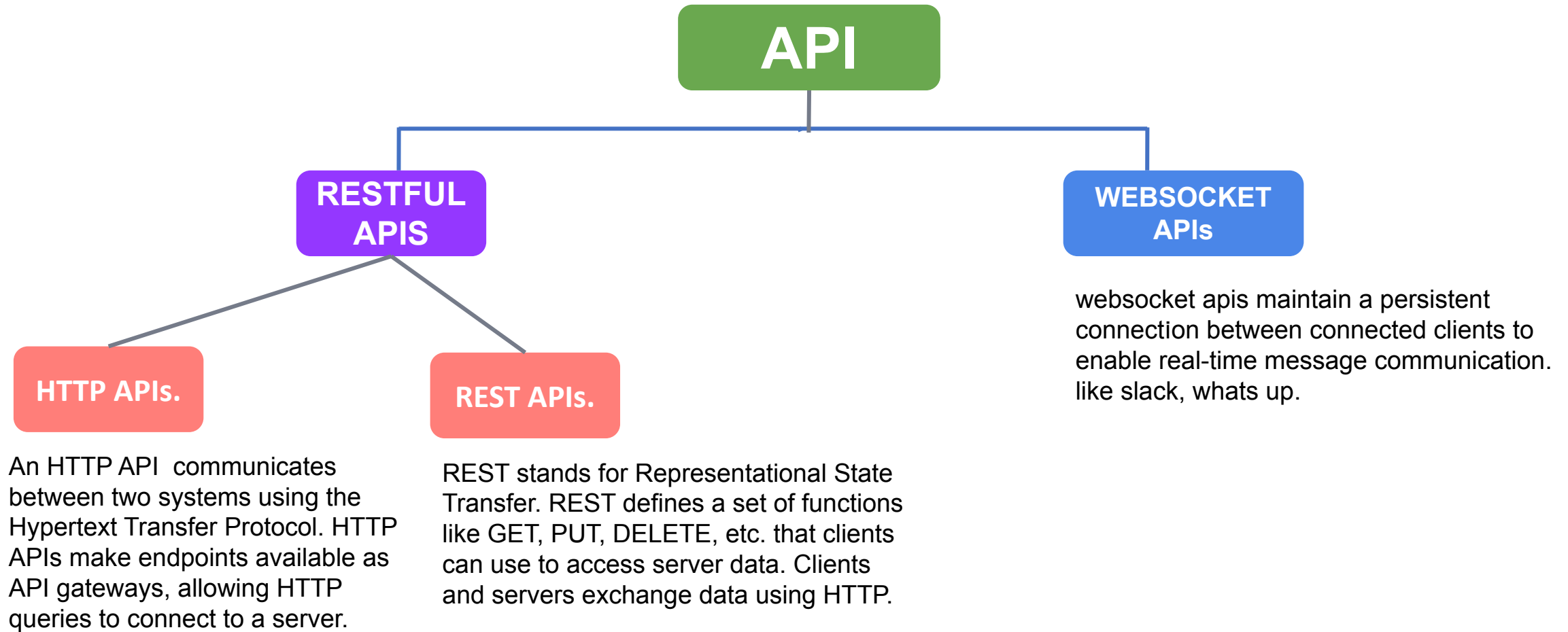
In that case if one API needs to talk to another, it can be done through API Gateway

API Gateway

API Gateway in AWS

API

RESTFUL APIS

WEBSOCKET APIs

websocket apis maintain a persistent connection between connected clients to enable real-time message communication. like slack, whats up.

HTTP APIs.

REST APIs.

An HTTP API communicates between two systems using the Hypertext Transfer Protocol. HTTP APIs make endpoints available as API gateways, allowing HTTP queries to connect to a server.

REST stands for Representational State Transfer. REST defines a set of functions like GET, PUT, DELETE, etc. that clients can use to access server data. Clients and servers exchange data using HTTP.

API Gateway

What is REST?

- REST (Representational State Transfer) is a service structure that enables easy and fast communication between client and server.

- REST runs on HTTP.

- JSON or XML type

API Gateway

What is RESTful ?

- Web services that use REST architecture are called RESTful services.

- GET - gets a resource.
- POST - creates a resource.
- PUT - replaces a resource.
- UPDATE/PATH - updates a resource.
- DELETE - deletes a resource.

RESTful API
DELETE POST PUT GET

AWS Lambda

Lambda and API Gateway

- Alexa
- **API Gateway**
- CloudTrail
- CloudWatch Events
- CloudWatch Logs
- CloudFormation
- CloudFront (Lambda@Edge)
- CodeCommit
- CodePipeline
- Cognito
- Config
- DynamoDB
- EC2
- ElastiCache
- Elastic Load Balancing

- EFS
- IoT
- IoT Events
- Kinesis Firehose
- Kinesis Streams
- Lex
- RDS
- S3
- S3 Batch
- SES
- SNS
- SQS
- Step Functions
- X-Ray

Although you can trigger Lambda function in different way, the most common trigger of the Lambda function is API Gateway

Thanks to Lambda and API Gateway combination you can create fully automated system.

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Web Services VS API

- Web Services and Development are a set of technologies and rules that facilitate communication between components on the web or internet, while APIs serve as interfaces between different applications to enable interoperability.

- Web services require a network connection and commonly use protocols like SOAP, while APIs can operate with or without a network and can utilize various protocols or design patterns.

- Additionally, web services primarily support HTTP, whereas APIs support HTTP/s, URL requests/response headers, and more.

- Both APIs and web services have their own advantages and are valuable in different contexts, so it is crucial to choose the appropriate solution based on specific business requirements.

THANKS!

Any questions?

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