BeSA Specialist – Serverless Week 1







Who Am I?

James Eastham

Professional Services consultant at AWS

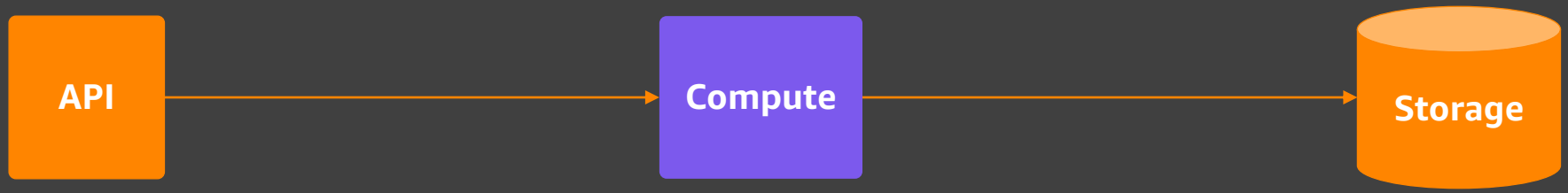
Lover of all things .NET and serverless

Ultra-runner

Dog dad

Start with Why?

Application elements



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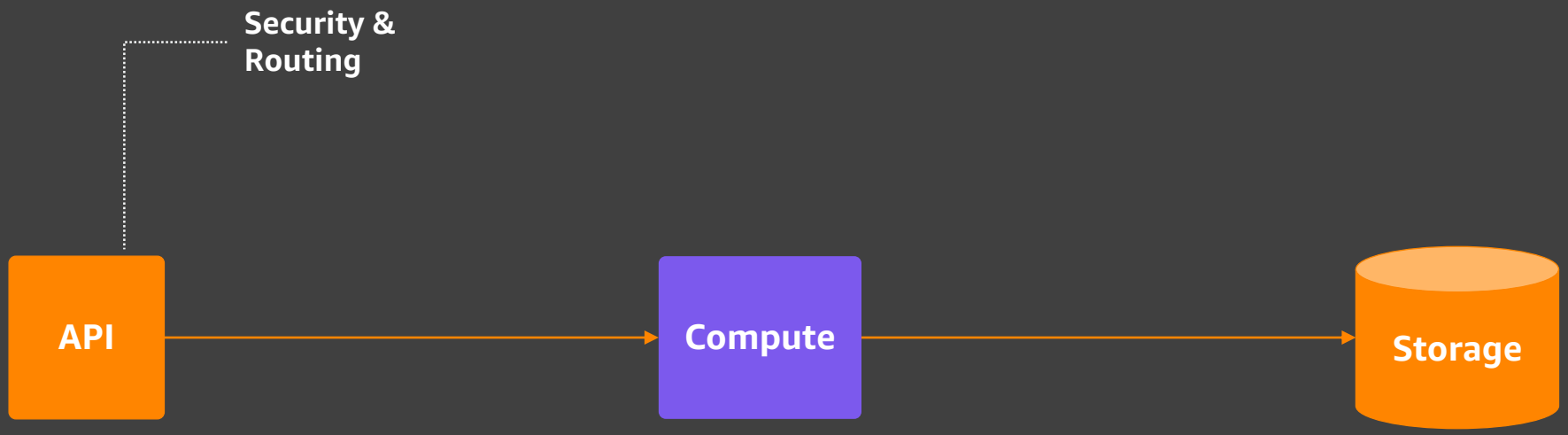

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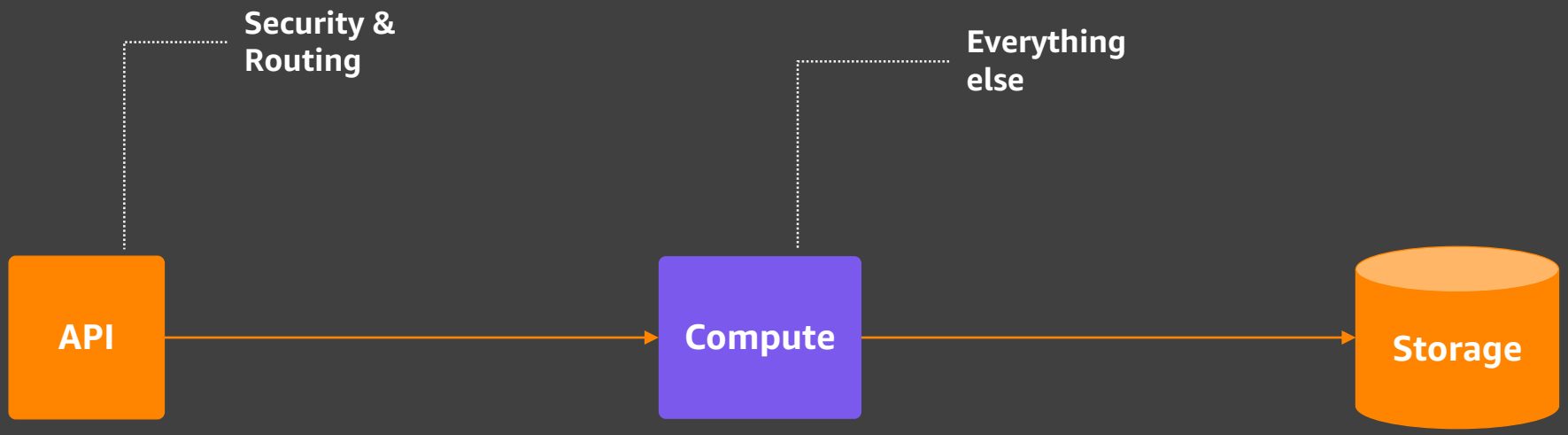

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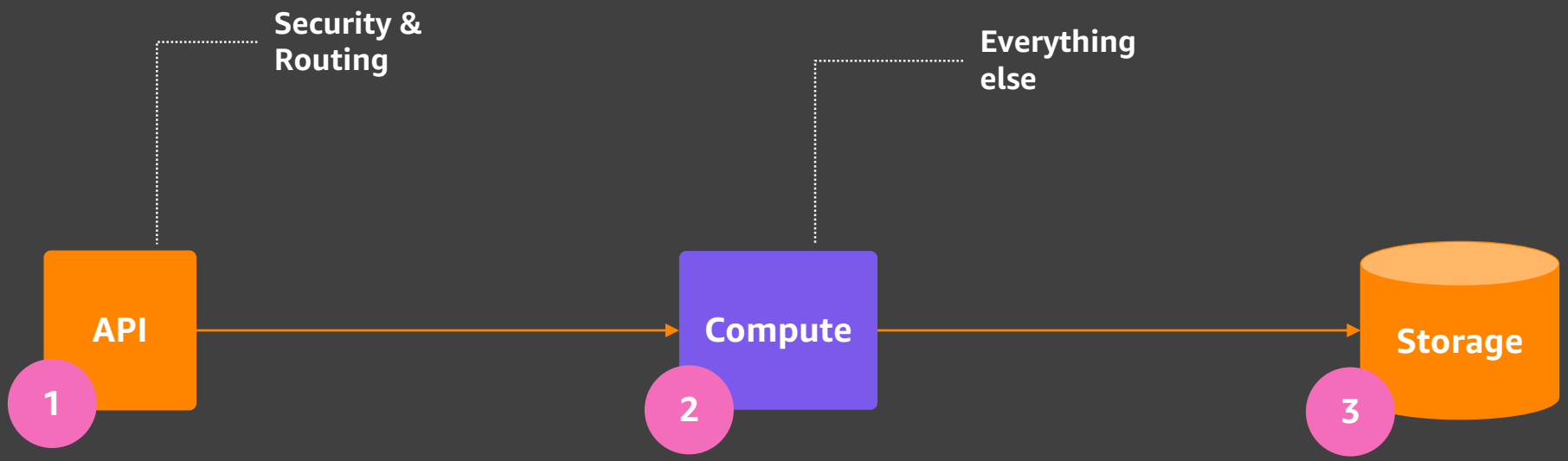

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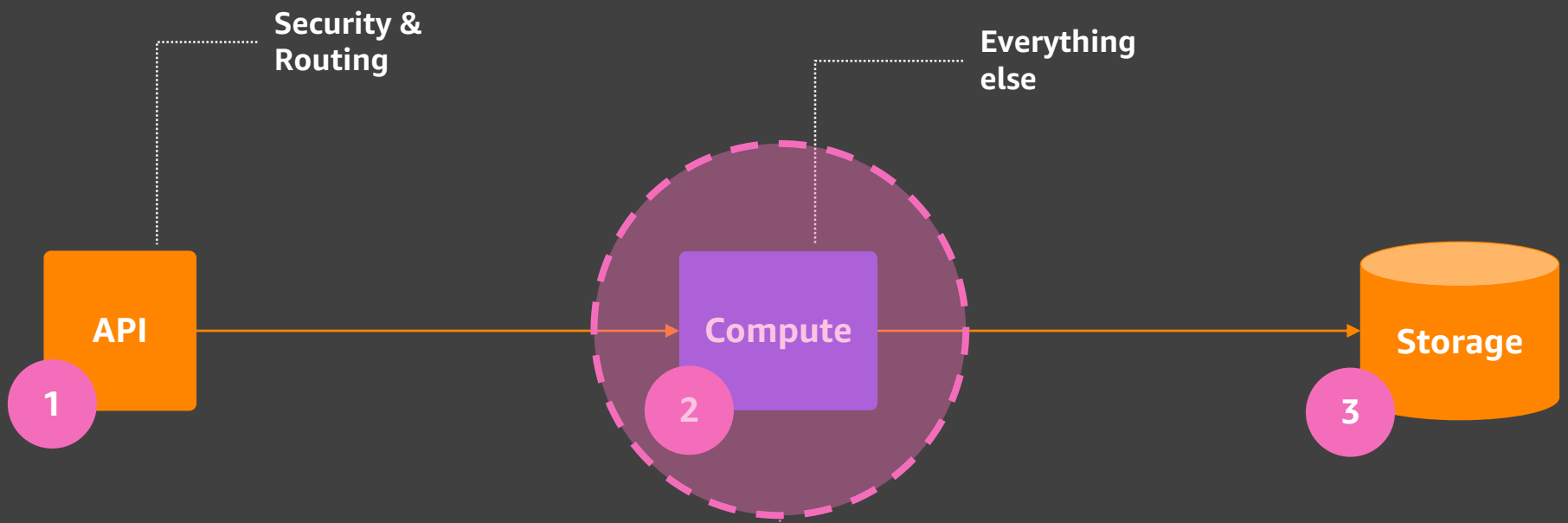

If something is going to go wrong, this is the most probable place

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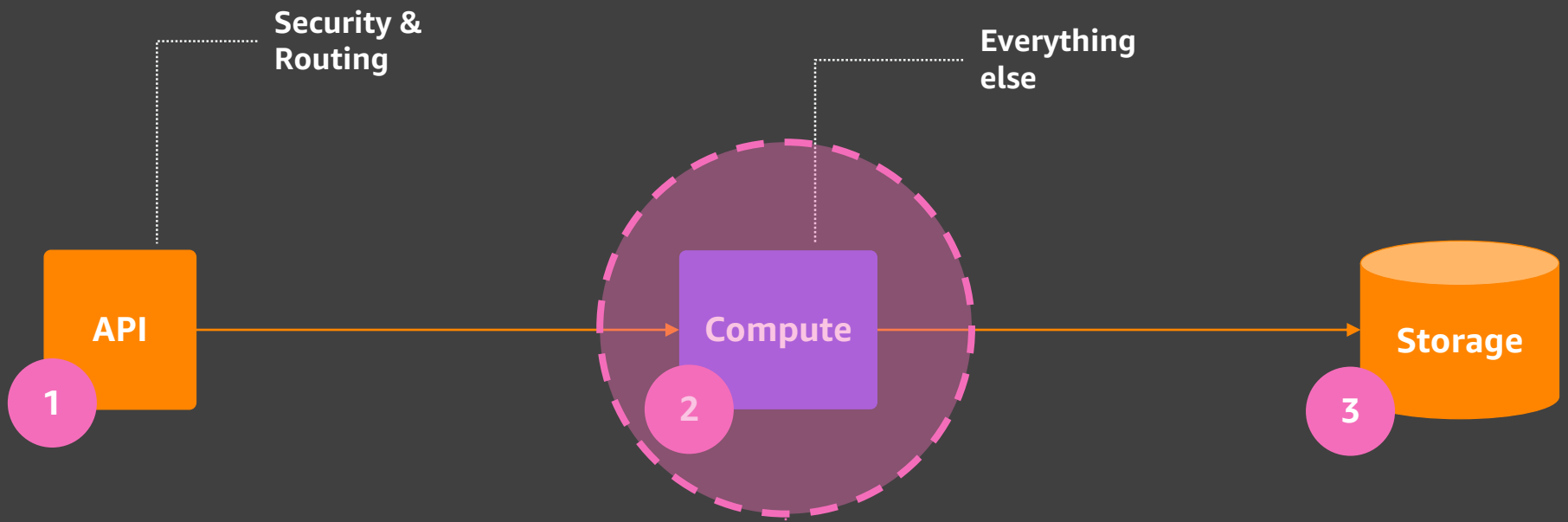

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Why?

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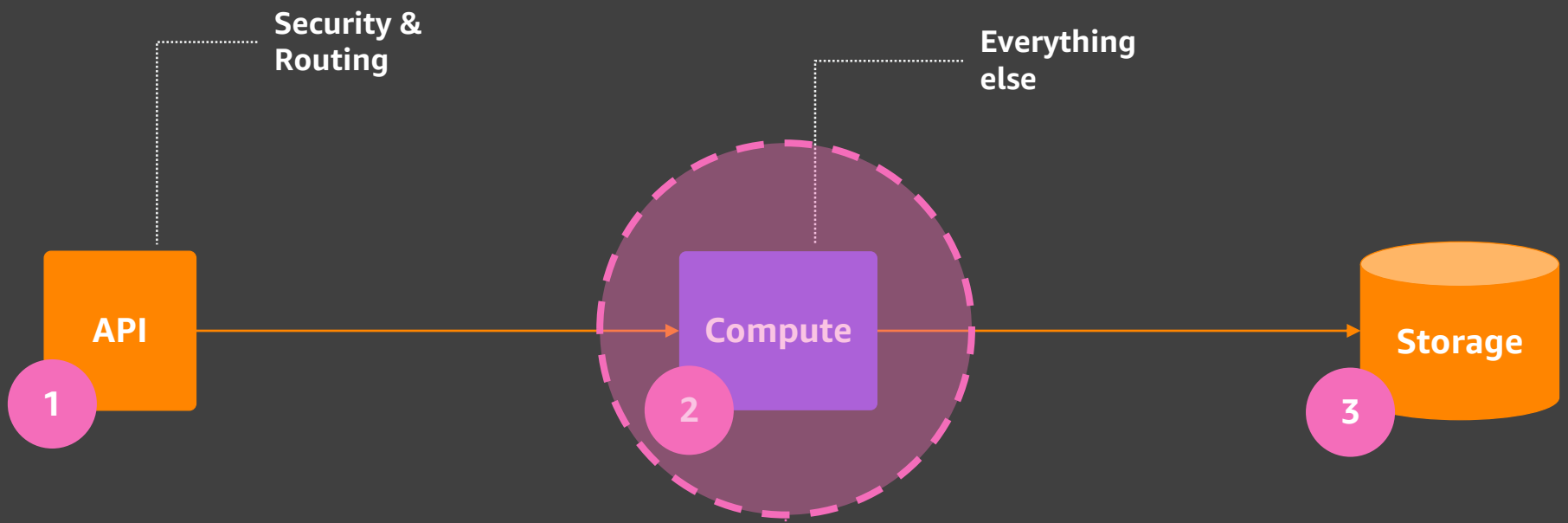

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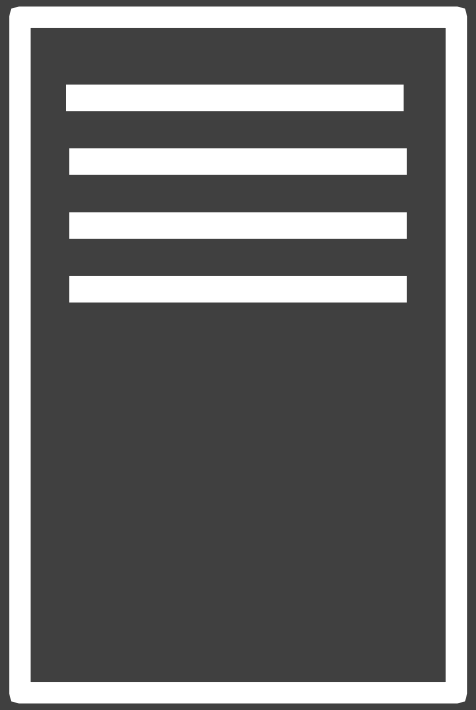
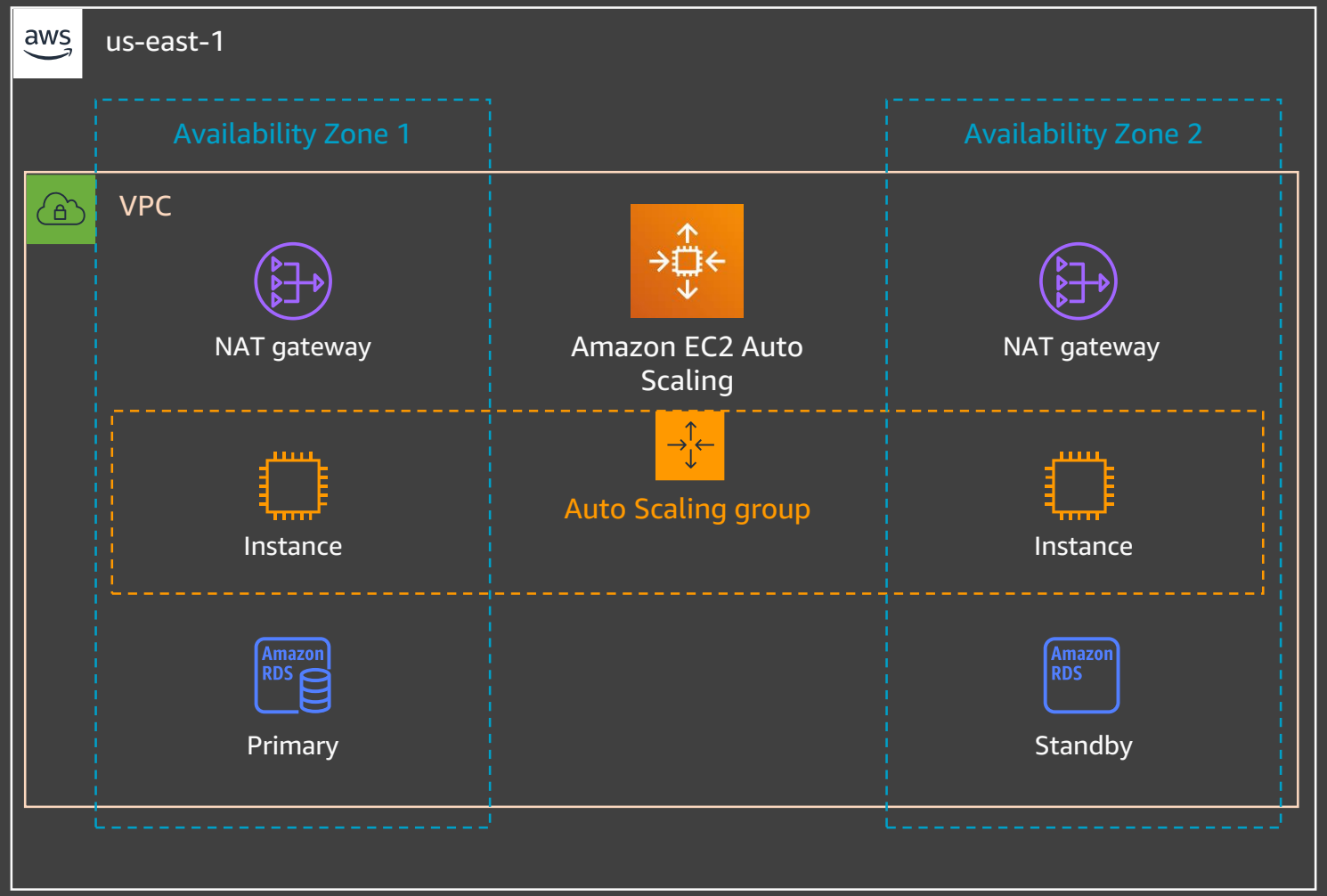
Why?

Because it is MY code!

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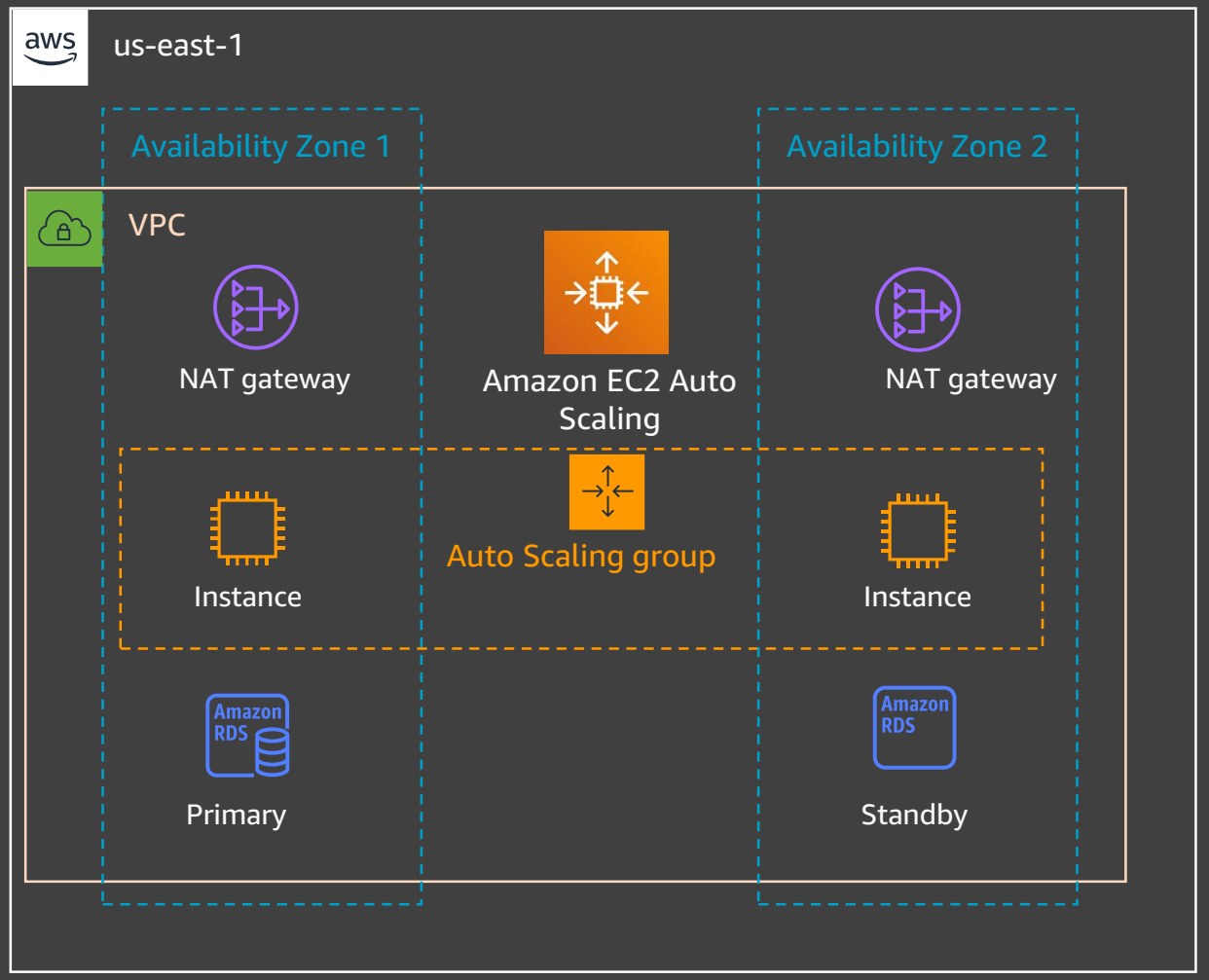
us-east-1
Availability Zone 1
Availability Zone 2
VPC
NAT gateway
Amazon EC2 Auto Scaling
NAT gateway
Auto Scaling group
Instance
Instance
Amazon RDS
Primary
Amazon RDS
Standby


53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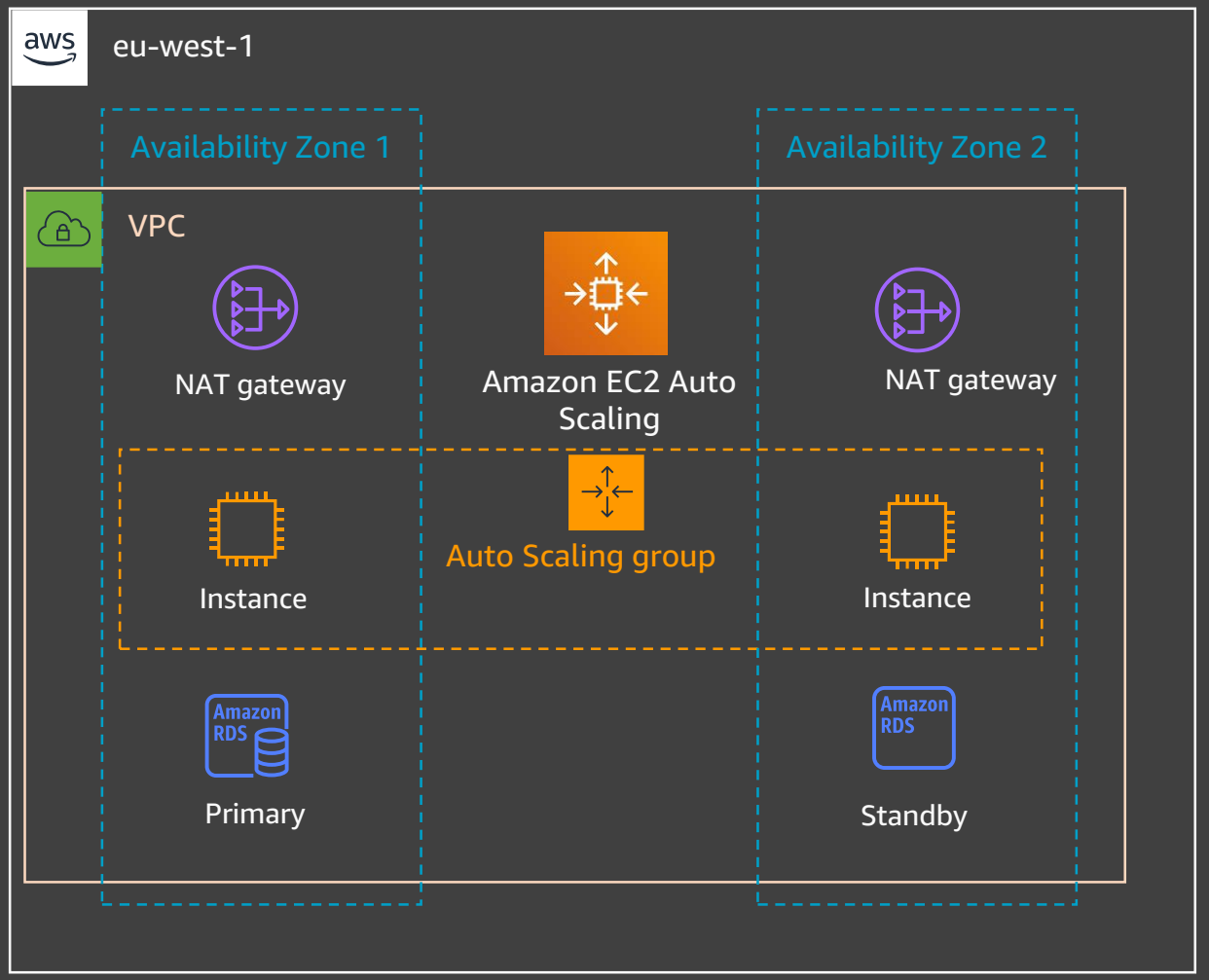
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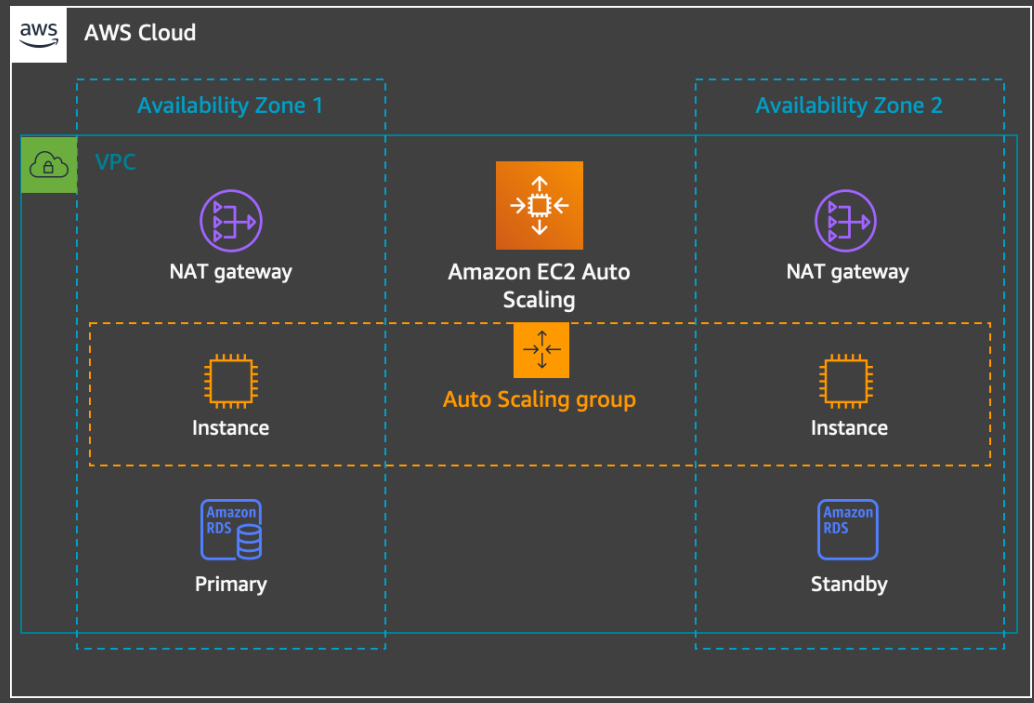
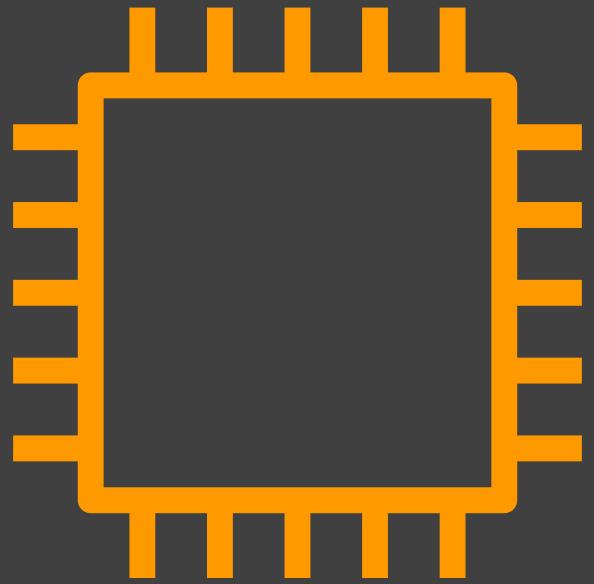
EC2 Auto Scaling

- Requires scaling policy
  - Which metric?
  - Host / fleet metric? Business metric?
  - Time-based?
- Health checks
  - Can be challenging
  - What does it mean to be unhealthy?
- Enhances resilience to host failure



Amazon EC2 Status Checks

- System
  - Loss of network connectivity
  - Loss of power
  - Host software issues
- Instance
  - Exhausted memory
  - File system corruption



AWS operational responsibility models

Compute	Virtual machine	Amazon EC2	AWS Elastic Beanstalk		Fargate	Lambda
Databases	MySQL	MySQL on Amazon EC2	Amazon RDS for MySQL	Amazon RDS	Amazon Aurora	DynamoDB
Storage	Storage					S3
Messaging	ESBs		Amazon MQ		Amazon Kinesis	EventBridge/SQS/SNS
Analytics	Hadoop	Hadoop on EC2	EMR		Amazon OpenSearch Service	Amazon Athena

Coupling

Coupling is a measure of independent variability between connected systems.

Decoupling has a cost, both at design and run-time.

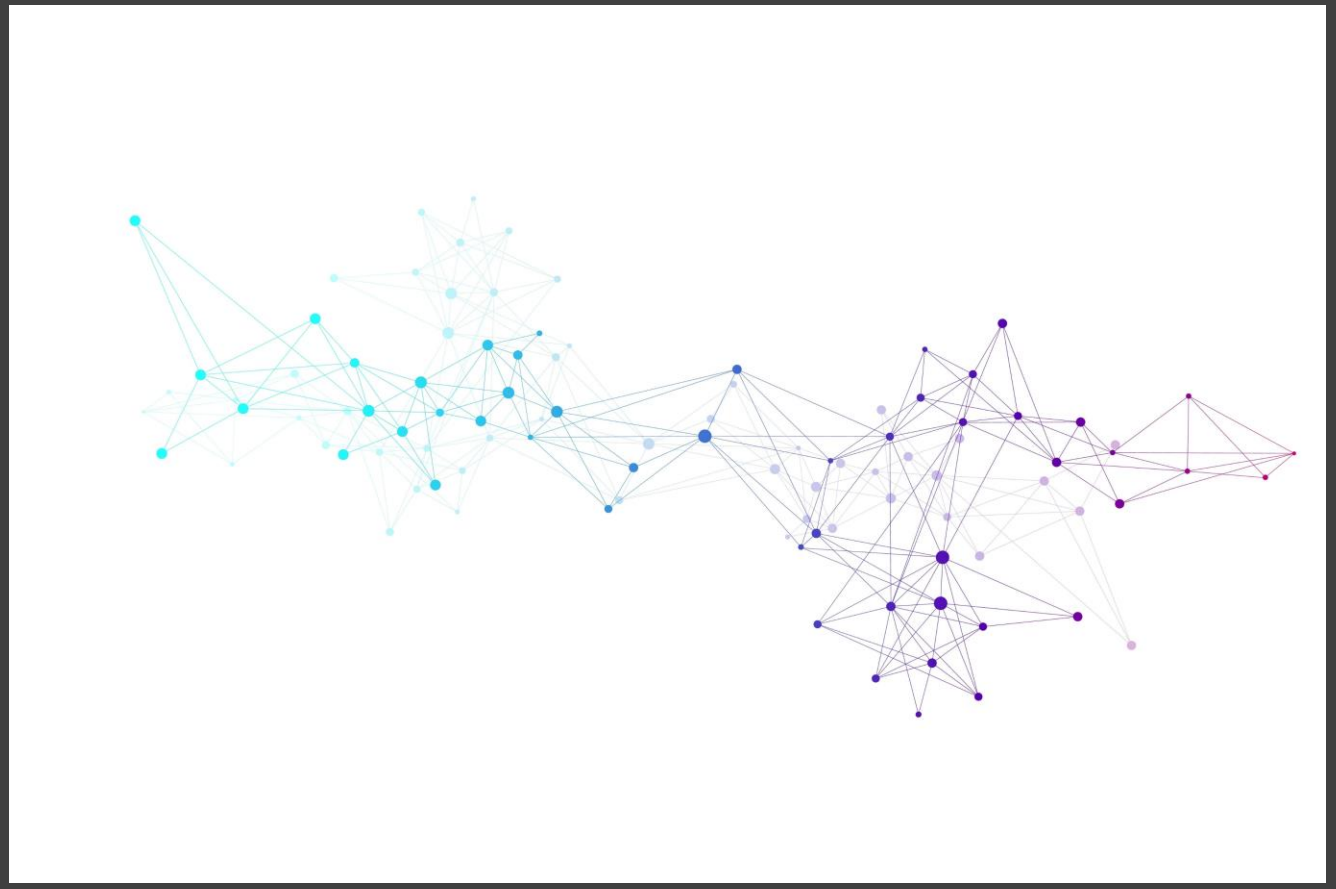
Coupling isn’t binary.

Coupling isn’t one-dimensional.

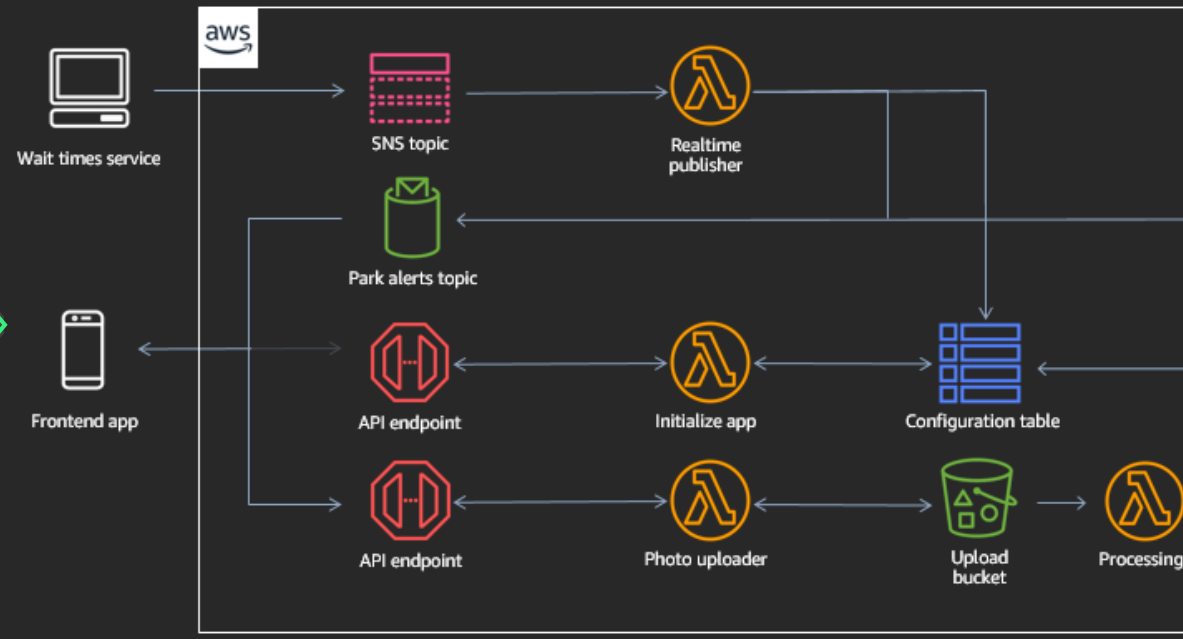
Source: EnterpriseIntegrationPatterns.com

The Fallacies of Distributed Computing

- **The network is reliable**
- **Latency is zero**
- Bandwidth is infinite
- **The network is secure**
- Topology doesn’t change
- There is one administrator
- **Transport cost is zero**
- **The network is homogenous**



Small pieces, loosely joined



What is AWS Lambda?

What is AWS Lambda

Event Source

Changes in data state

Requests to endpoints

Changes in resource state

Function

Business logic

.NET/C#

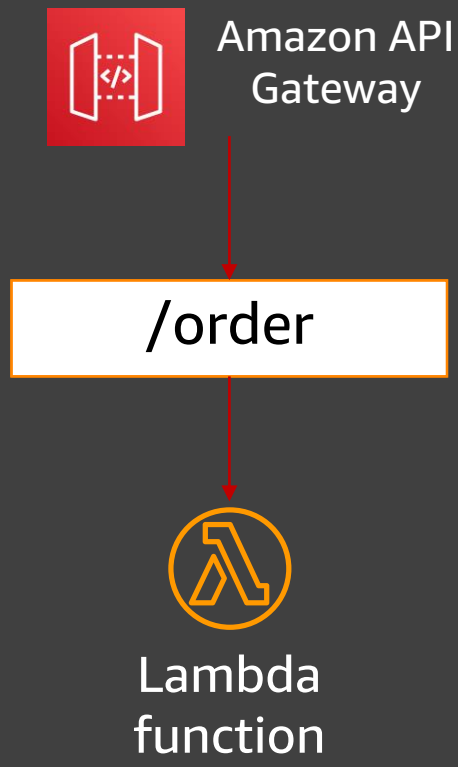
Node.js, Python, Java, Go,
Ruby, PowerShell
Bring Your Own

Services / Other

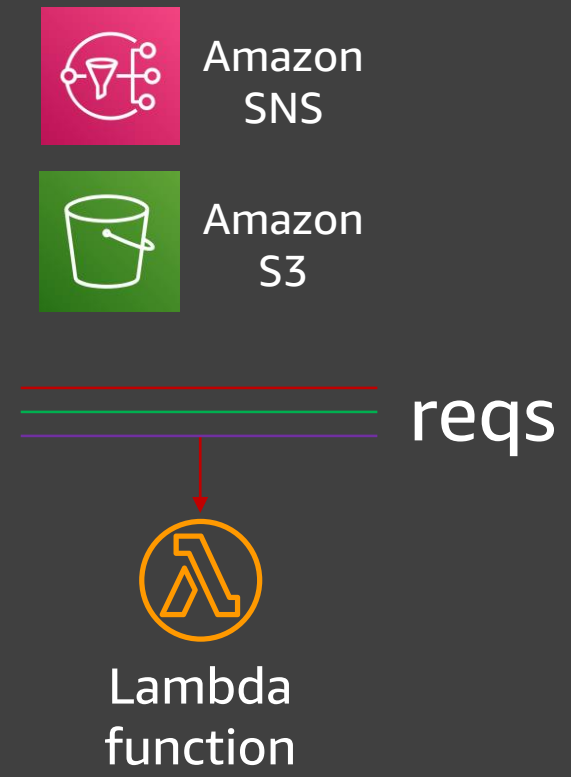
Many more…

Lambda Execution Models

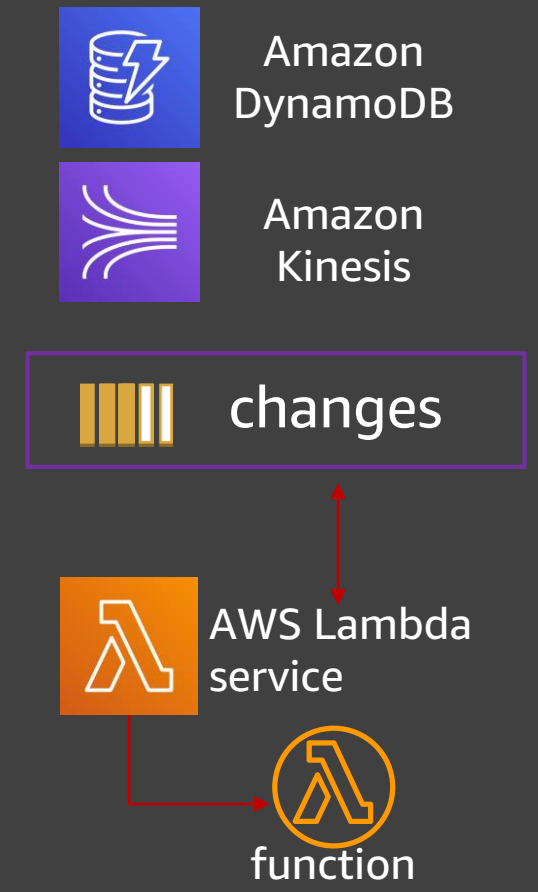
Synchronous



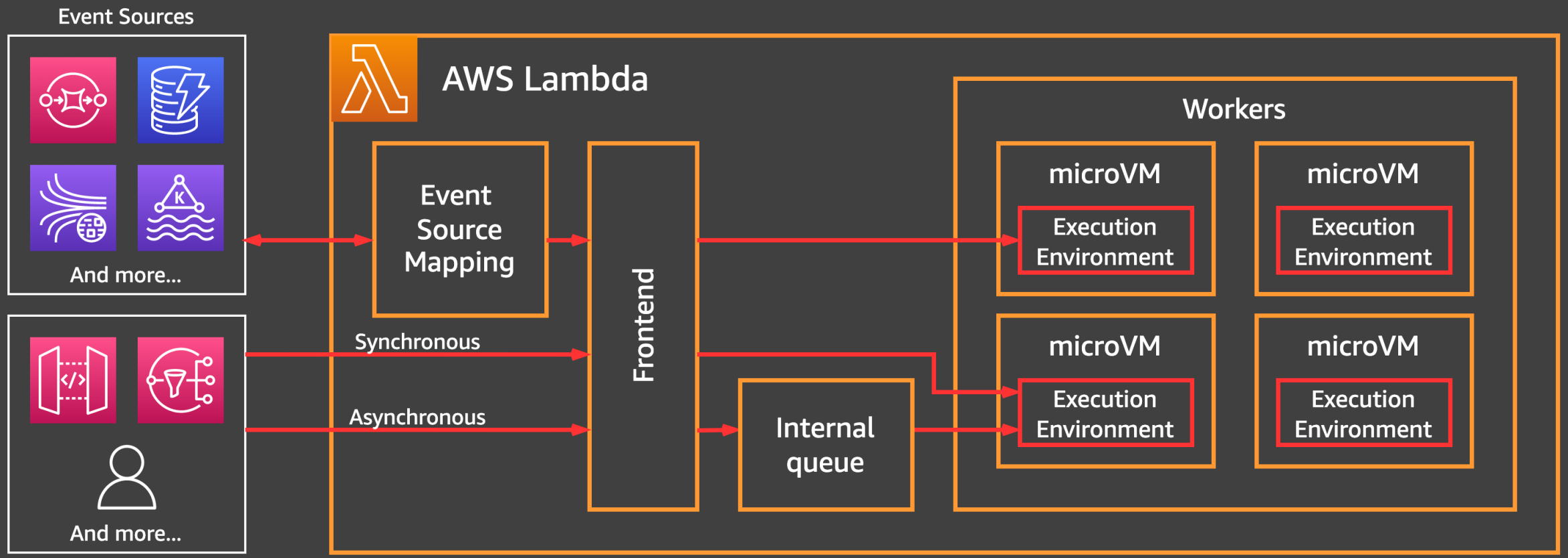
Asynchronous



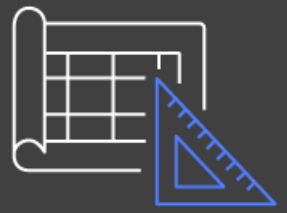
Poll



AWS Lambda under the hood



General approach to thinking serverlessly



- Features first
  - Avoid monolithic thinking

- Focus on events
  - Events are triggers that cause action

- Stateless
  - The key to scaling effectively

- Use the services
  - Don’t reinvent the wheel

Serverless is more than compute

COMPUTE


AWS Lambda


AWS Fargate

DATA STORES


Amazon S3


Amazon Aurora Serverless


Amazon DynamoDB

INTEGRATION


Amazon API Gateway


AWS AppSync


Amazon EventBridge


Amazon Simple Queue Service (Amazon SQS)

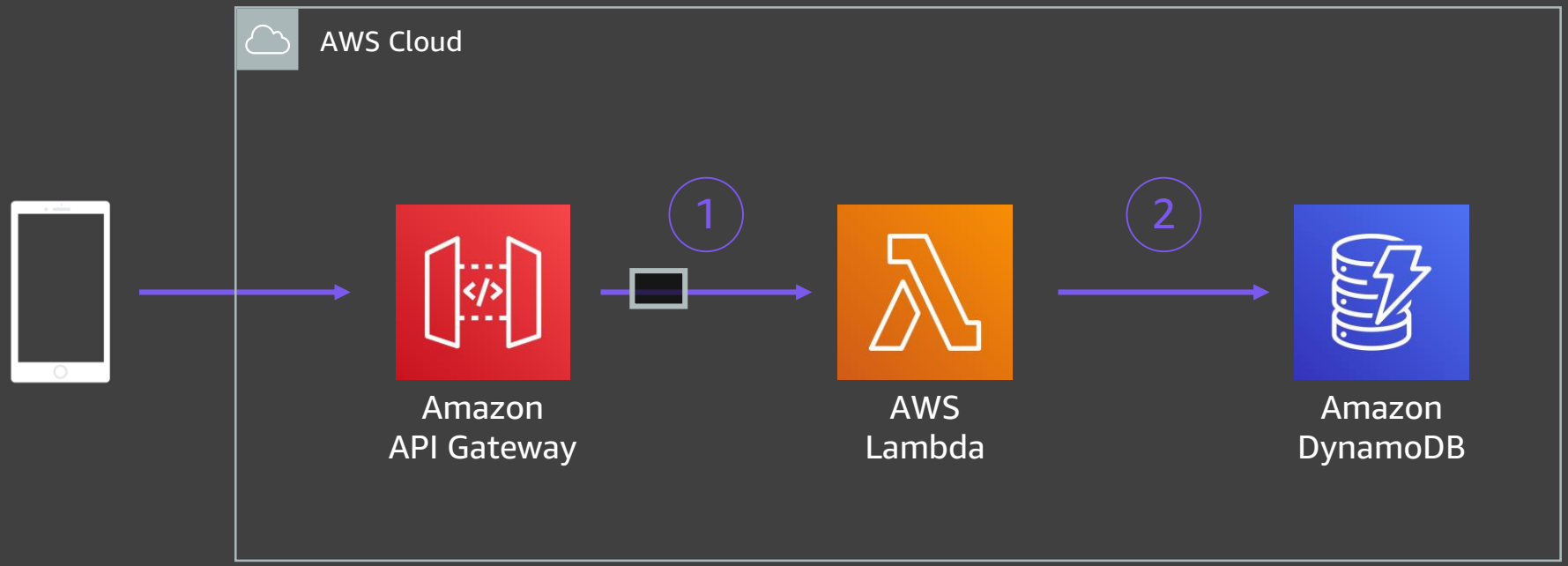

Amazon Simple Notification Service (Amazon SNS)


AWS Step Functions

Build with serverless

RESTful Microservices

Highly-scalable microservices

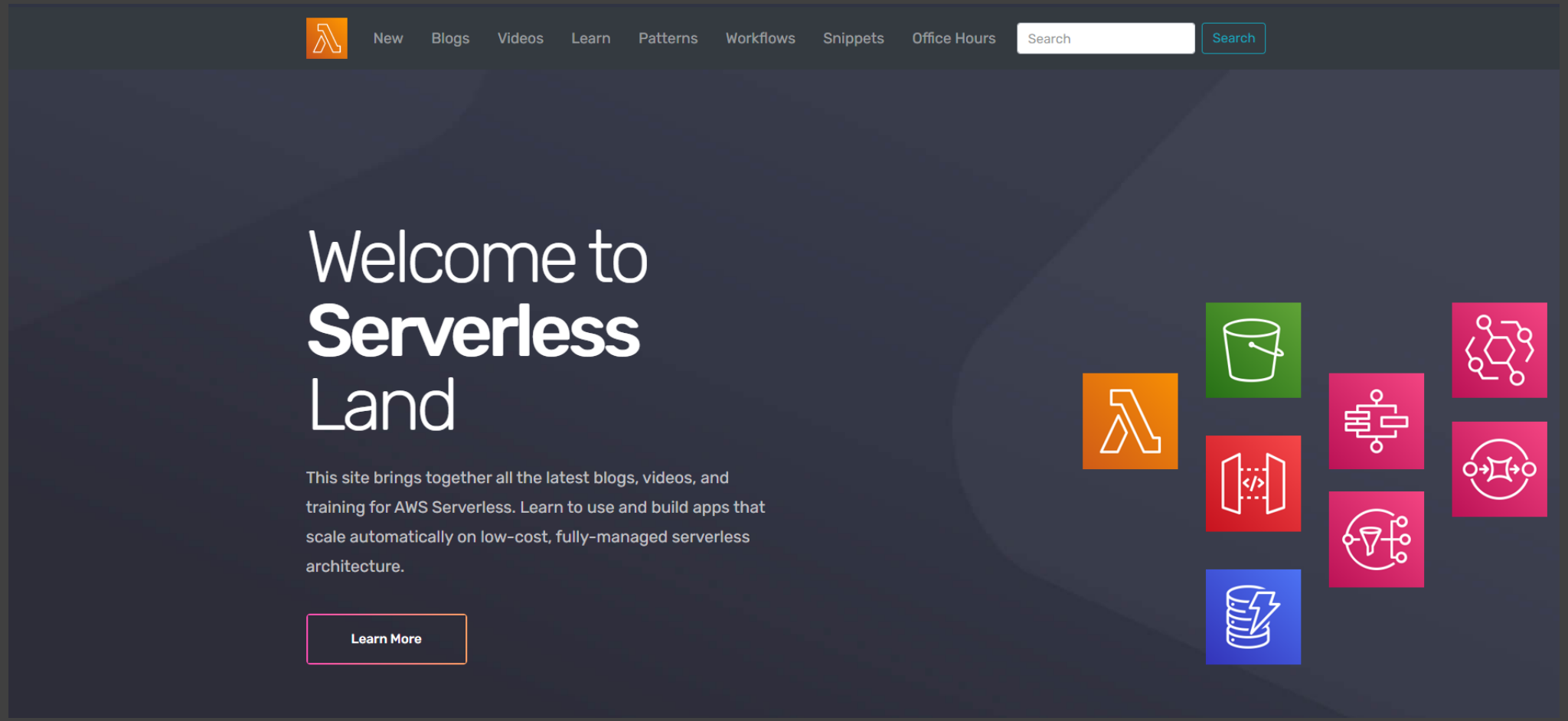


1. API Gateway “translates” incoming HTTP request to event payload
2. Lambda reads / writes data from data store

Is Lambda the right fit for my workload?

* Source: Deloitte 2019

Next Steps



https://serverlessland.com/

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