Serverless Patterns

(The awkward early years)

@mikebroberts

https://symphonia.io/

So we're on the same page...

@mikebroberts

Serverless Computing is about building systems using **Serverless Services**

Serverless Services =

FaaS + BaaS

FaaS

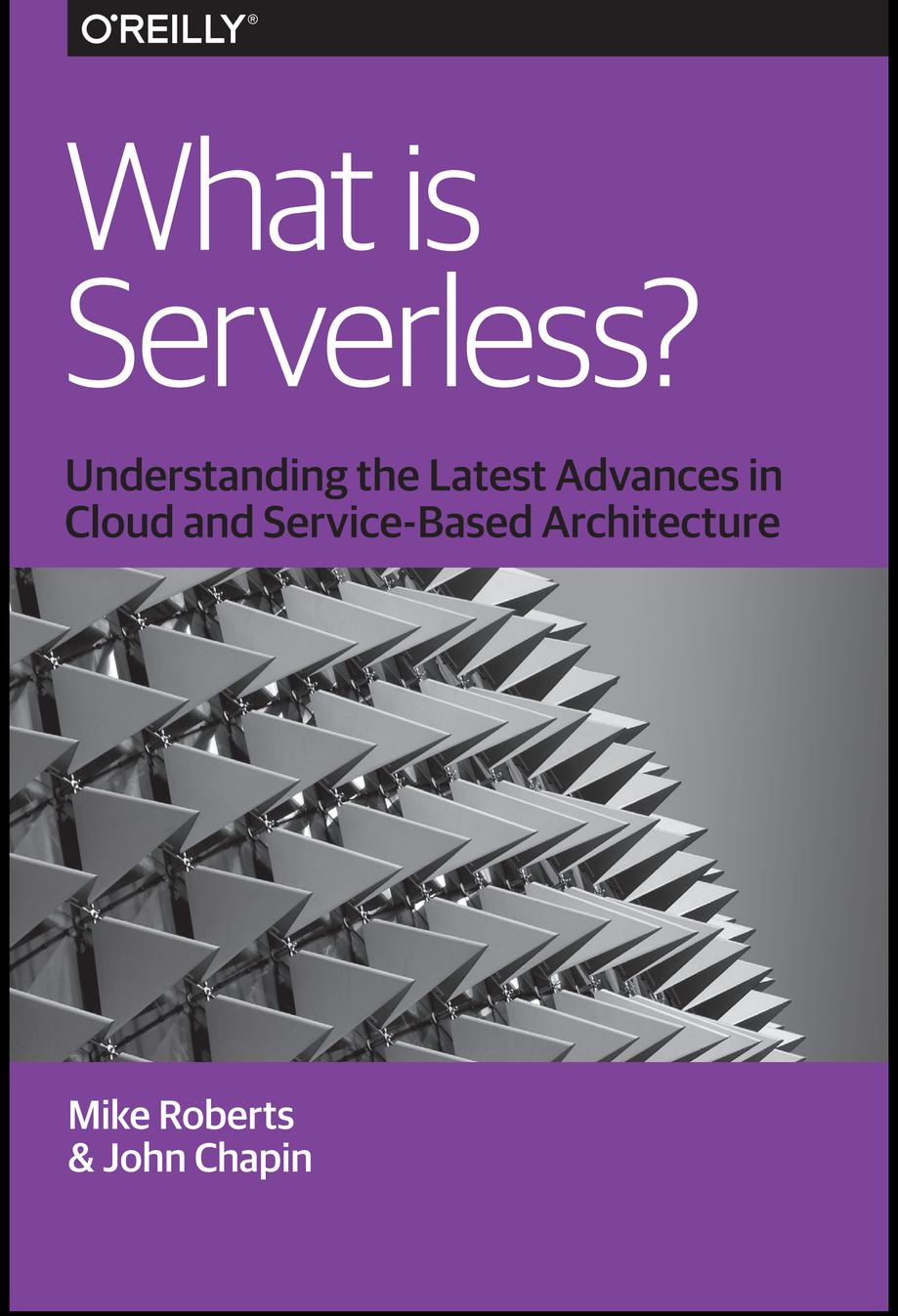
Functions as a Service

BaaS

Backend as a Service

“What is Serverless?”

https://symphonia.io/



What are Patterns?

@mikebroberts

"Patterns … identify common solutions to recurring problems."

https://www.martinfowler.com/ieeeSoftware/patterns.pdf

"Patterns are a proven way to capture experts' knowledge in fields where there are no simple ‘one size fits all’ answers."

Hohpe & Woolf : Enterprise Integration Patterns

In other words, patterns are **NOT best practices**!

Key parts of a pattern

1. A name! (Groups of patterns form a *vocabulary)*
2. Implementation
3. What problem it solves: when, and when NOT to use it

“The awkward early years”

@mikebroberts

Serverless is new enough that we're still **learning new ways of doing things**

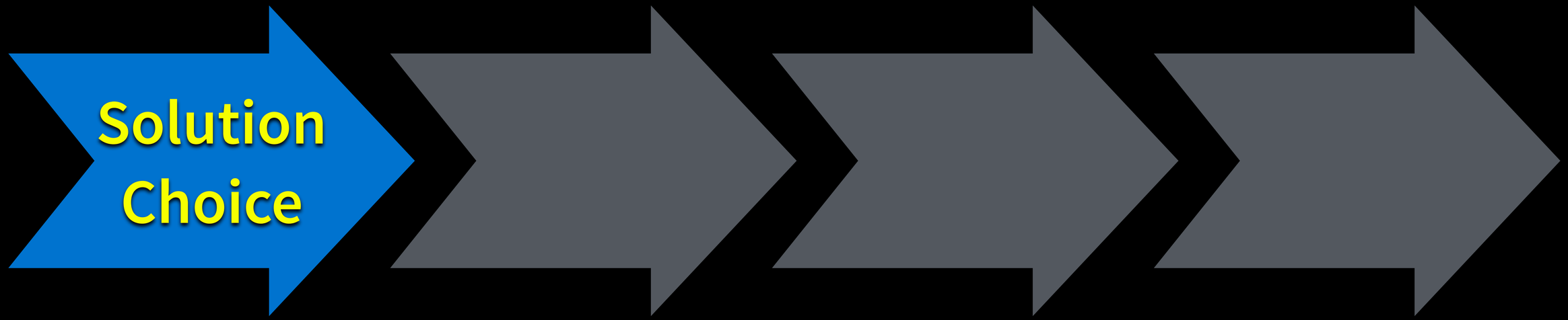
Serverless is new enough that we're still **forming opinions of what solutions are common**

But we DO know enough to get started!

Serverless Pattern Categories

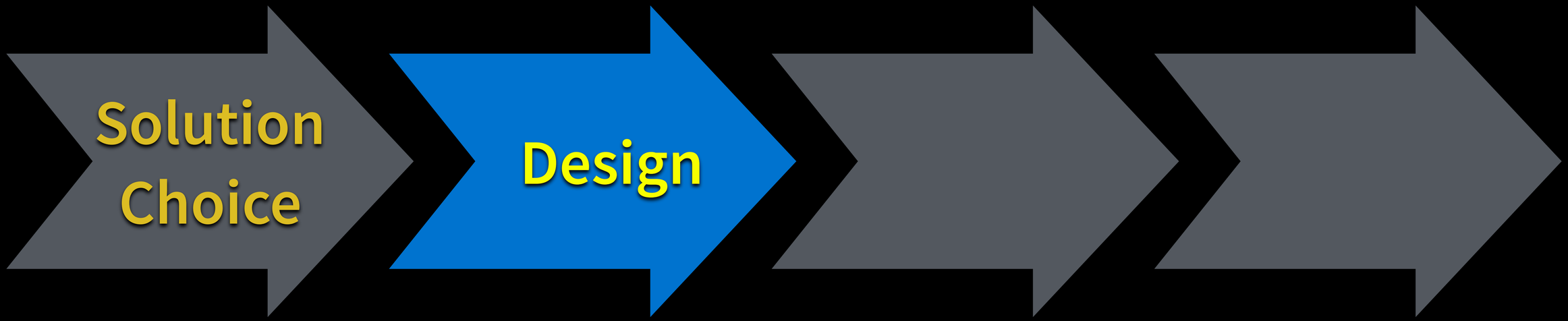
@mikebroberts

Serverless impacts many activities



Feature Patterns

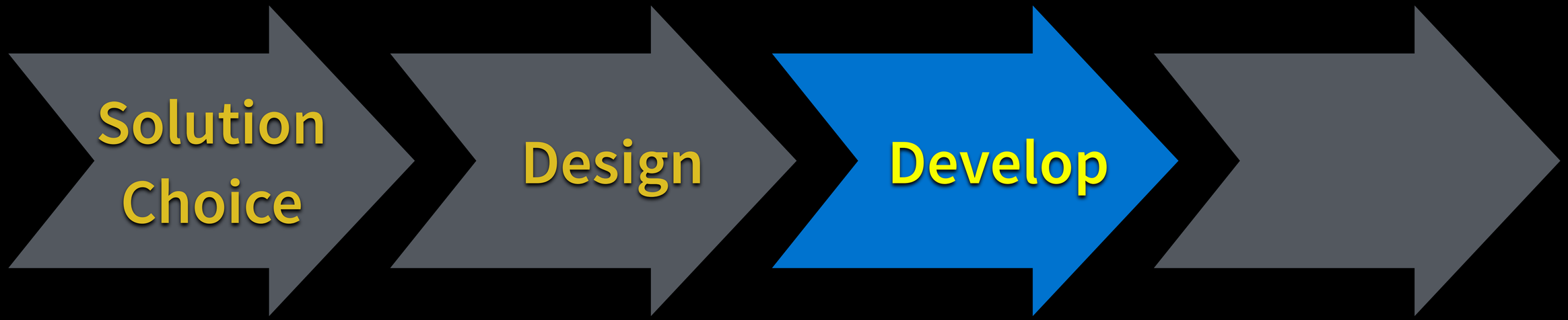
Serverless impacts many activities



Architecture Patterns

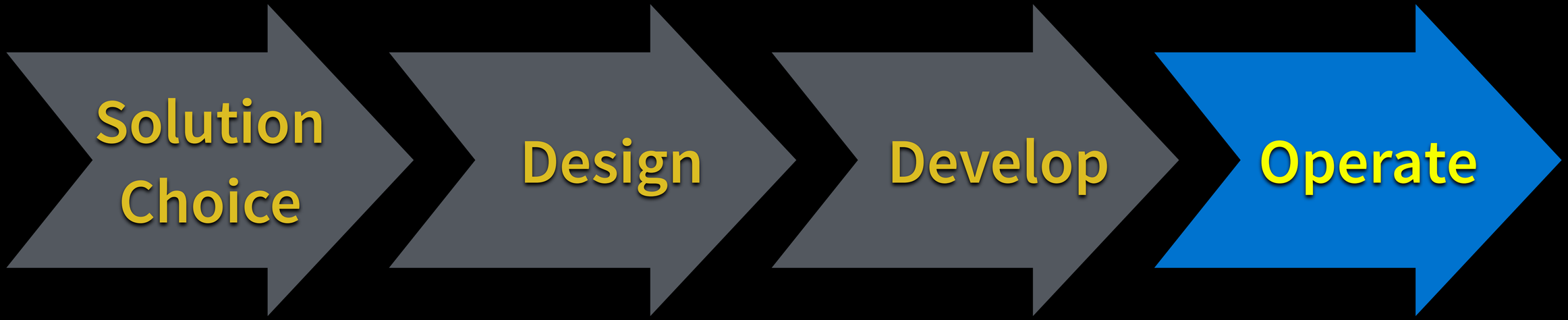
Service and Function Patterns

Serverless impacts many activities



Development Patterns

Serverless impacts many activities



Deployment Patterns

Monitoring Patterns

Feature Patterns

@mikebroberts

Image Resizer

Image Resizer

How do I have a highly scalable capability of resizing images without having to constantly run servers?

Image Resizer

Image Resizer

When not to use?

- Need a lower latency solution
- Don’t want to store every combination of possible sizes - wan’t to provide just-in-time capability instead
- If you have significant throughput and costs would be an issue (but take heed, Lambda is often surprisingly inexpensive!)

Architecture Patterns

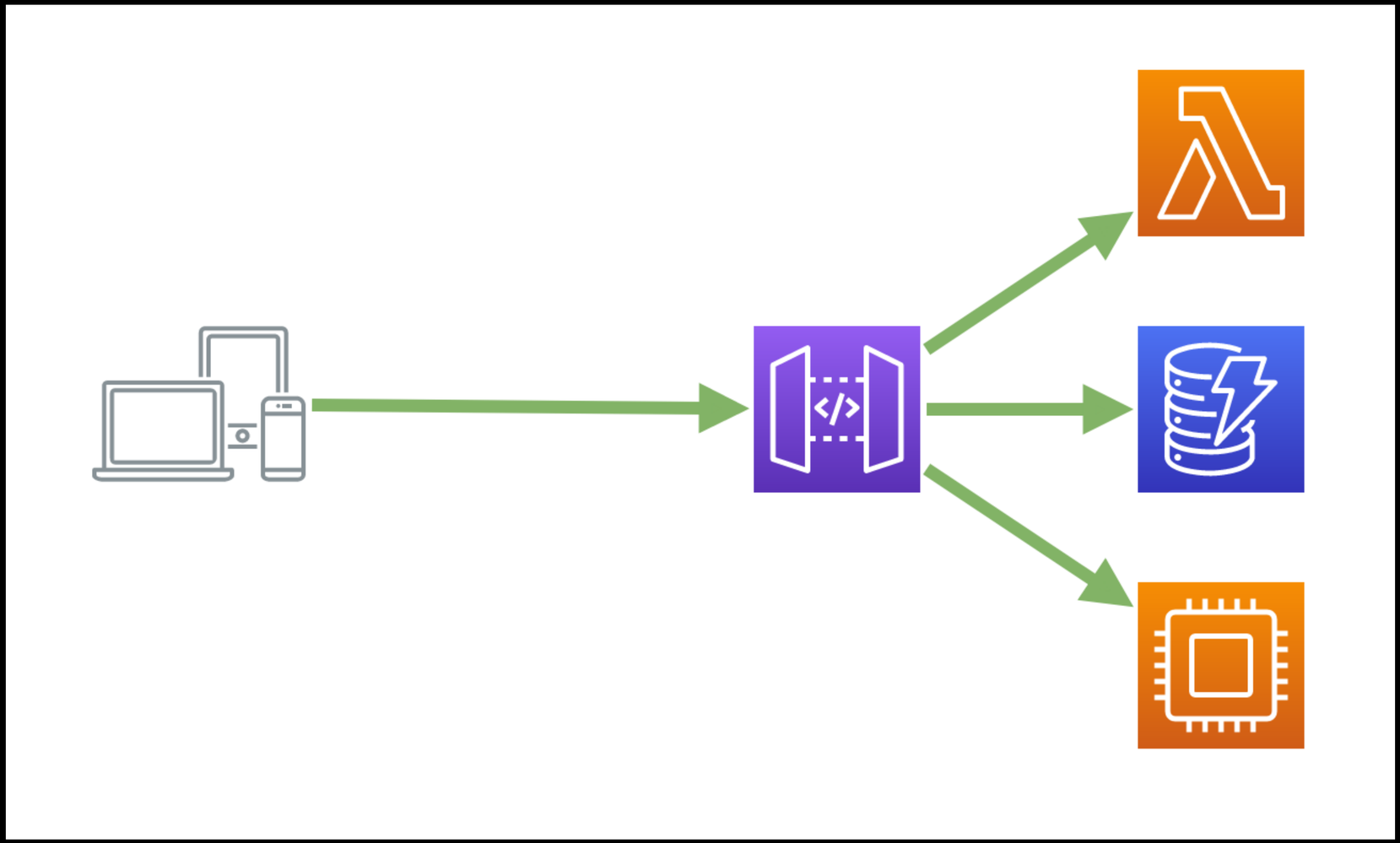
@mikebroberts

Serverless API

Serverless API

How do I build an HTTPS API without having to consider resource management or scaling concerns?

Serverless API



Serverless API

When not to use?

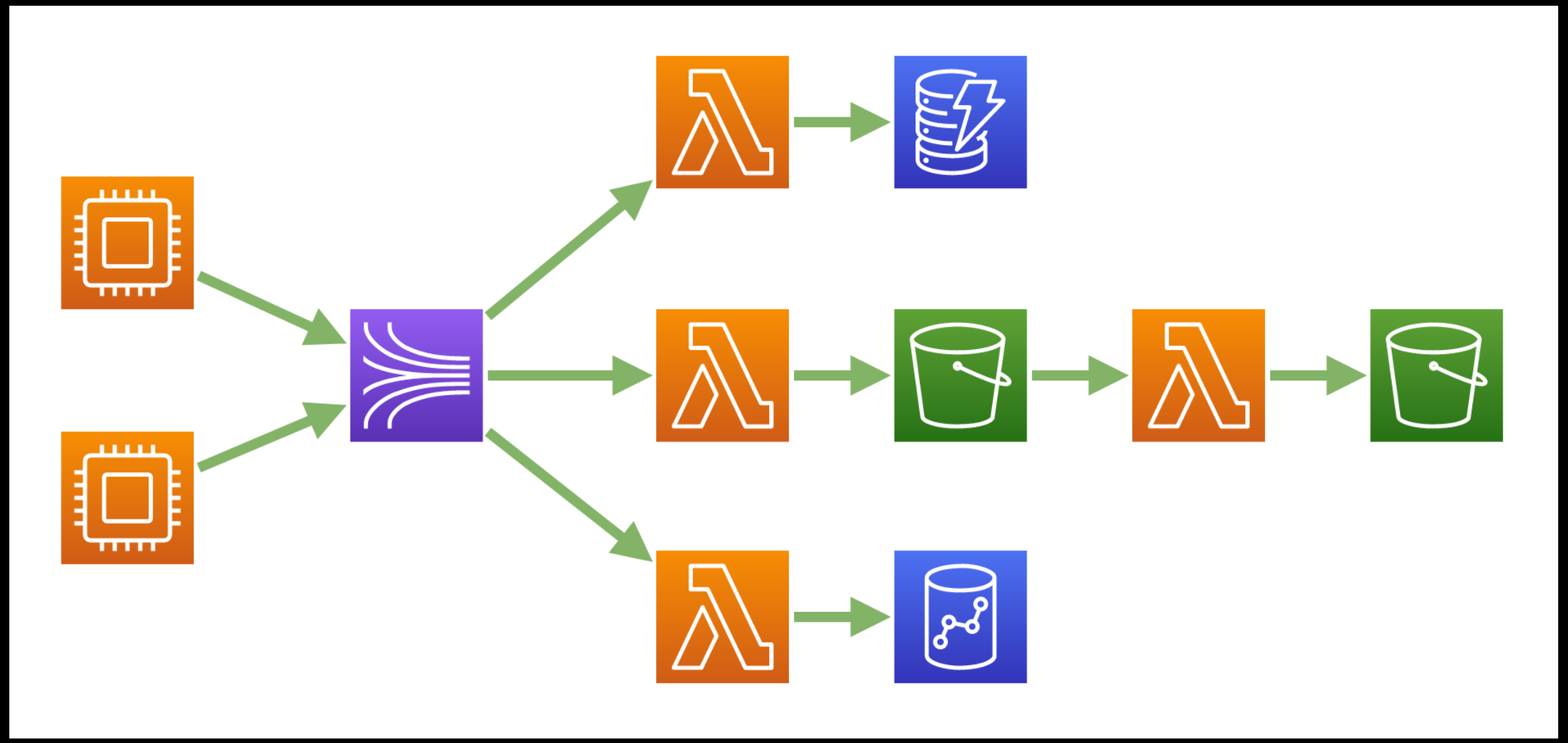
- Where latency concerns are not compatible with present-day capabilities
- Where throughput makes total costs too high in comparison with traditional techniques

Serverless Data Pipeline

Serverless Data Pipeline

How do I build a data pipeline that has great scaling capabilities, and also allows new components to be added without significant infrastructure knowledge?

Serverless Data Pipeline



Serverless Data Pipeline

When not to use?

- Use a hybrid approach (Serverless / traditional) where certain transform stages are not suitable for FaaS.
- If you have staggeringly high throughput, to the point that Serverless techniques would be far too expensive, then *maybe* consider a fully traditional approach.

Service & Function Patterns

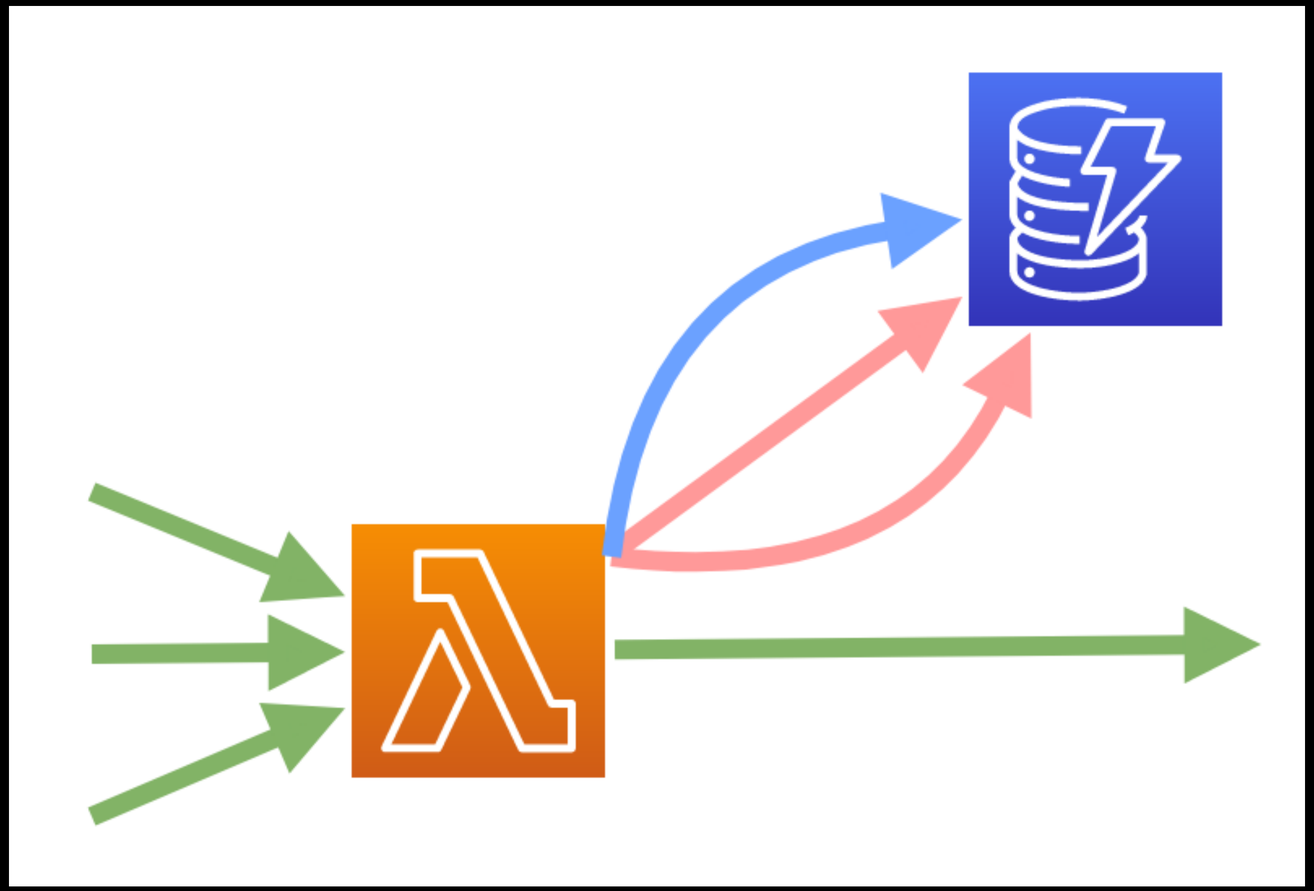
@mikebroberts

Idempotent Function

Idempotent Function

How do I guarantee that there is at most one side-effect for each event that triggers a FaaS function?

Idempotent Function



Idempotent Function

When not to use?

- If your side-effect can be implemented in an idempotent way
- If duplicated side-effects are infrequent enough, or unimportant enough, that the fact that they happen can be lived with
- If your system’s throughput is such that DynamoDB costs would be prohibitively expensive

Development Patterns

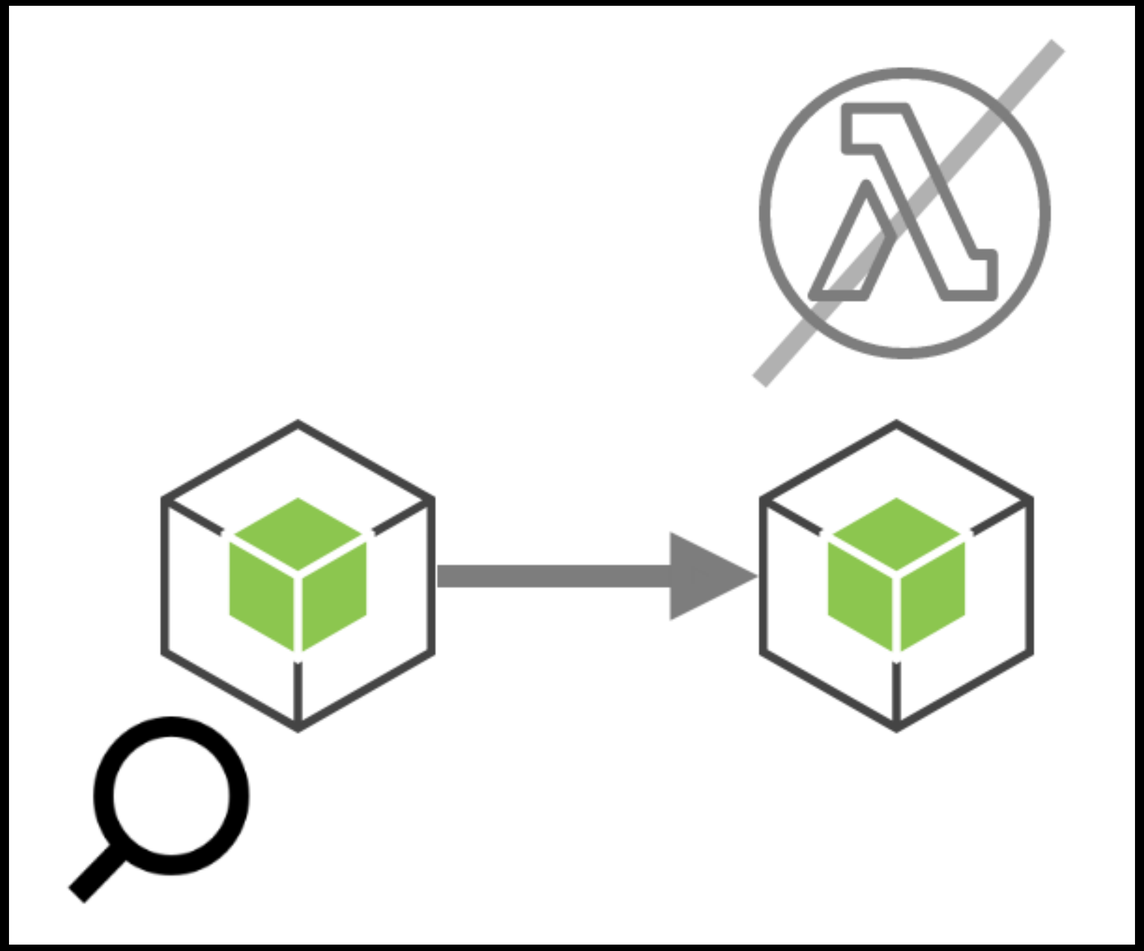
@mikebroberts

FaaS-Free Unit Test

FaaS-Free Unit Test

How do I write unit tests for my FaaS Function that don’t suffer from the startup time of local or remote FaaS runtimes?

FaaS-Free Unit Test



FaaS-Free Unit Test

When not to use?

- If you are exploring the event that is sent (e.g. TDD FaaS development, in some cases)
- If your unit test is more like a functional test, requiring access to cloud resources

Deployment Patterns

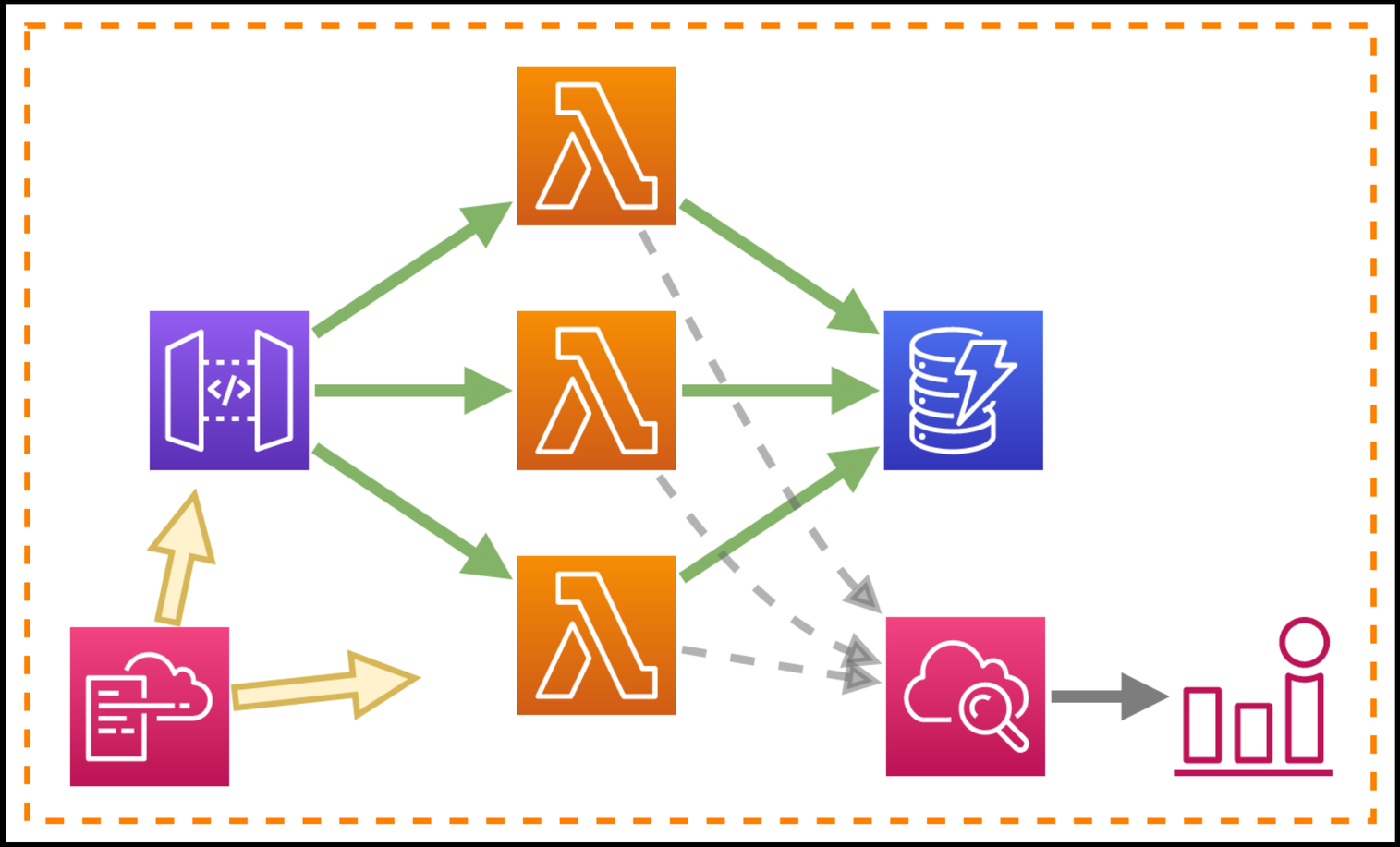
@mikebroberts

Serverless Application

Serverless Application

How do I group number of different functions and configured services within one coherent, deployable, unit

Serverless Application



Serverless Application

When not to use?

- If you're performing a small integration between 2 existing components ("Serverless Spackle / Polyfilla") then don't force arbitrary grouping of Lambda functions / components. Sometimes one component is enough!

Monitoring Patterns

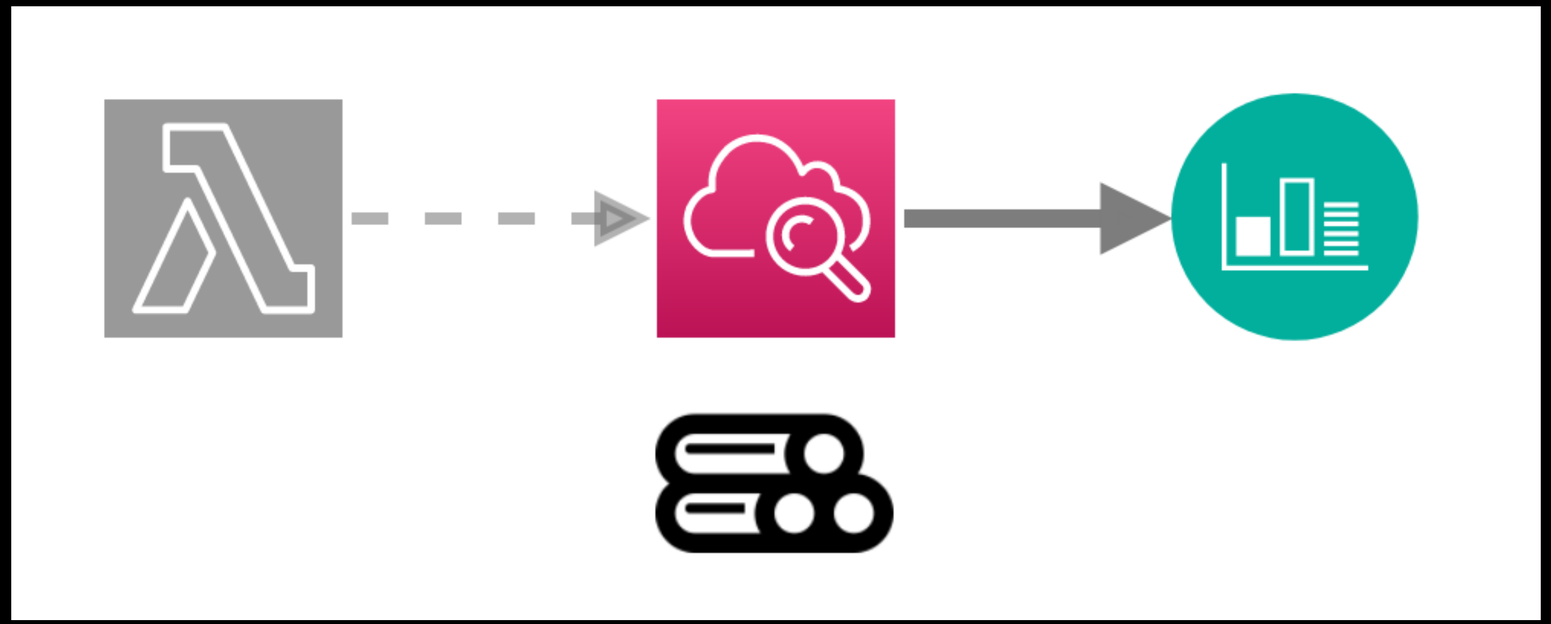
@mikebroberts

Log Sourced Metric

Log Sourced Metric

How do we capture application metrics when a metric collection service may not be able to handle the scaling behavior of functions deployed to a FaaS platform?

Log Sourced Metric



Log Sourced Metric

When not to use?

- If you're using a vendor metric system that *does* scale (e.g. through sampling)
- If you don't want to capture application metrics from your Lambda function

Sourcing your own patterns

@mikebroberts

What solutions do you see repeated throughout your organization?

Use the categories to narrow down your search

Remember to think about when, and when NOT, to use a solution

Summing up

@mikebroberts

We’re still figuring out common patterns of Serverless

But we do have some ideas now

Useful to break Serverless into different activity categories in order to source patterns

And I showed you a few to get started!

Thanks!

Slides and links at

https://go.symphonia.io/sacon-nyc-patterns

@mikebroberts
https://symphonia.io/
mike@symphonia.io