

Modernization with containers and serverless technologies

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Amazon Web Services



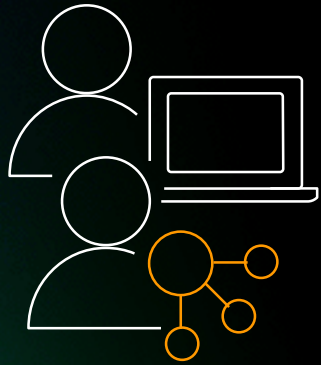
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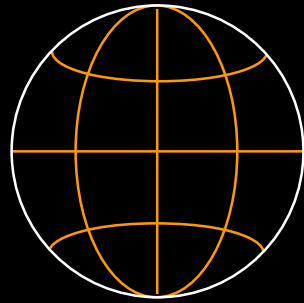
Agenda

- Modern Applications Overview
- Choosing a Serverless Compute Strategy: AWS Lambda
- Choosing a Containers Strategy

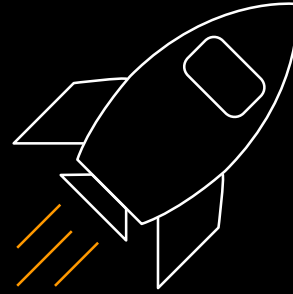
Modern Applications



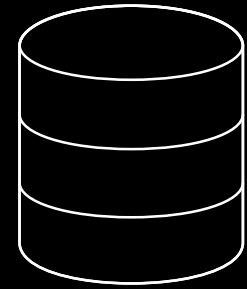
Scale to
millions of users



Global availability

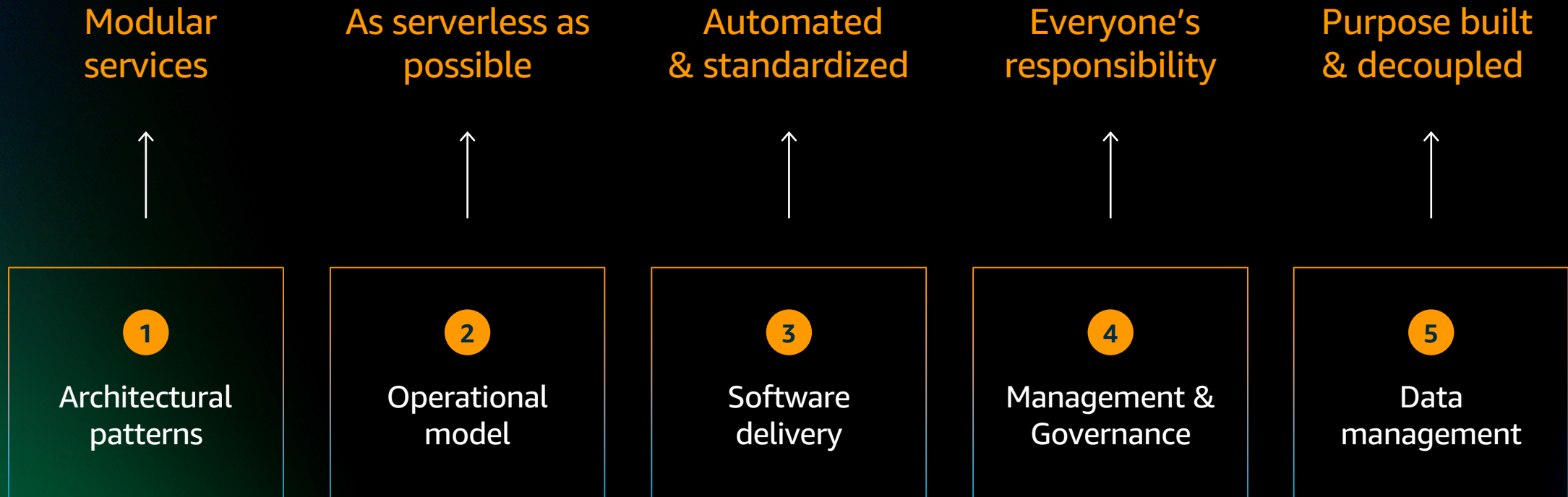


Respond
in milliseconds

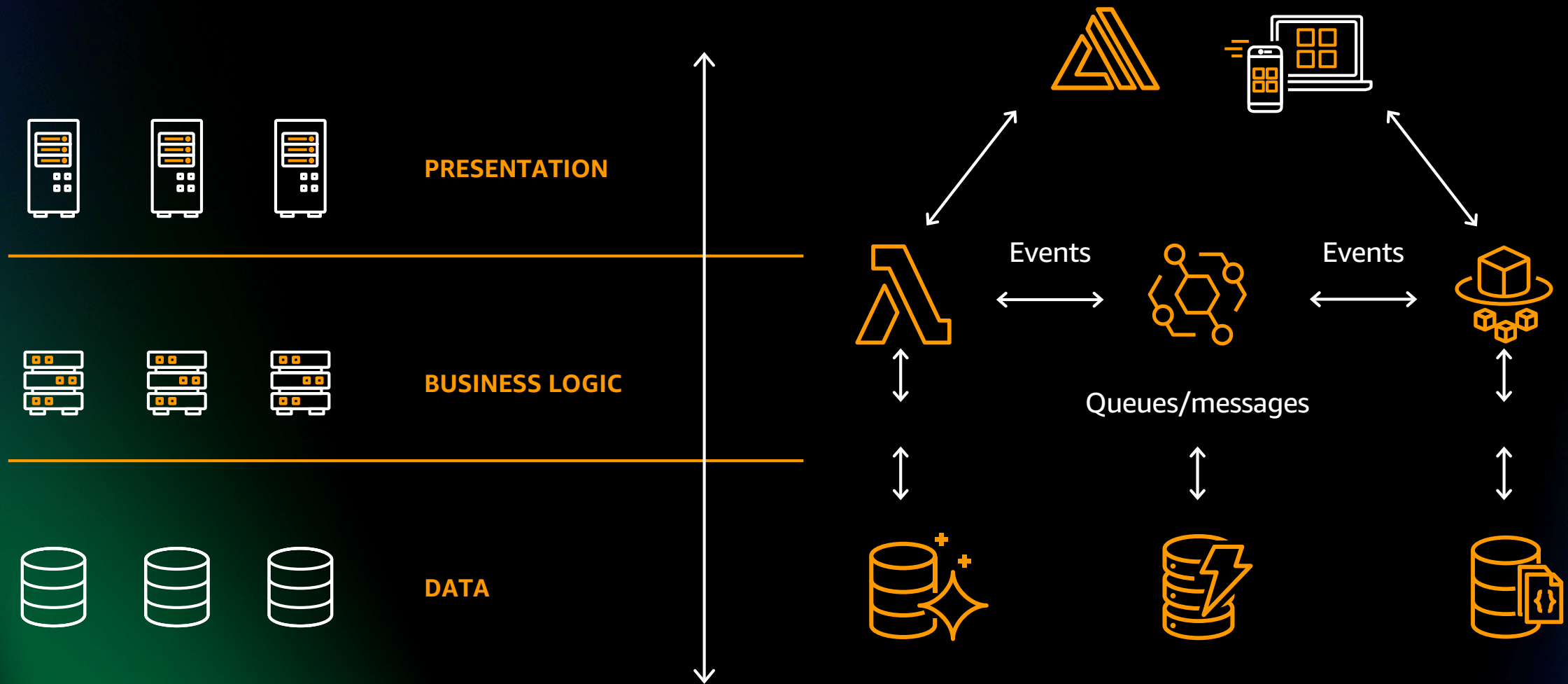


Handle
petabytes of data

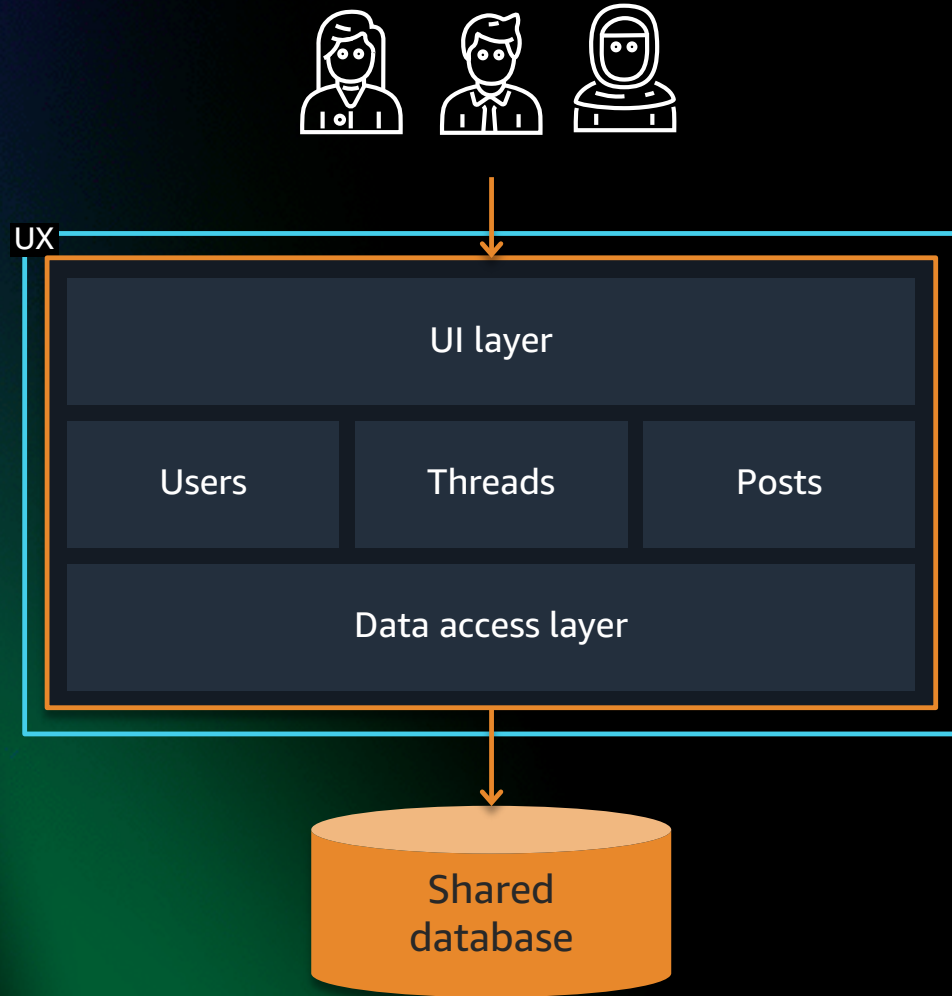
Modern Application Characteristics



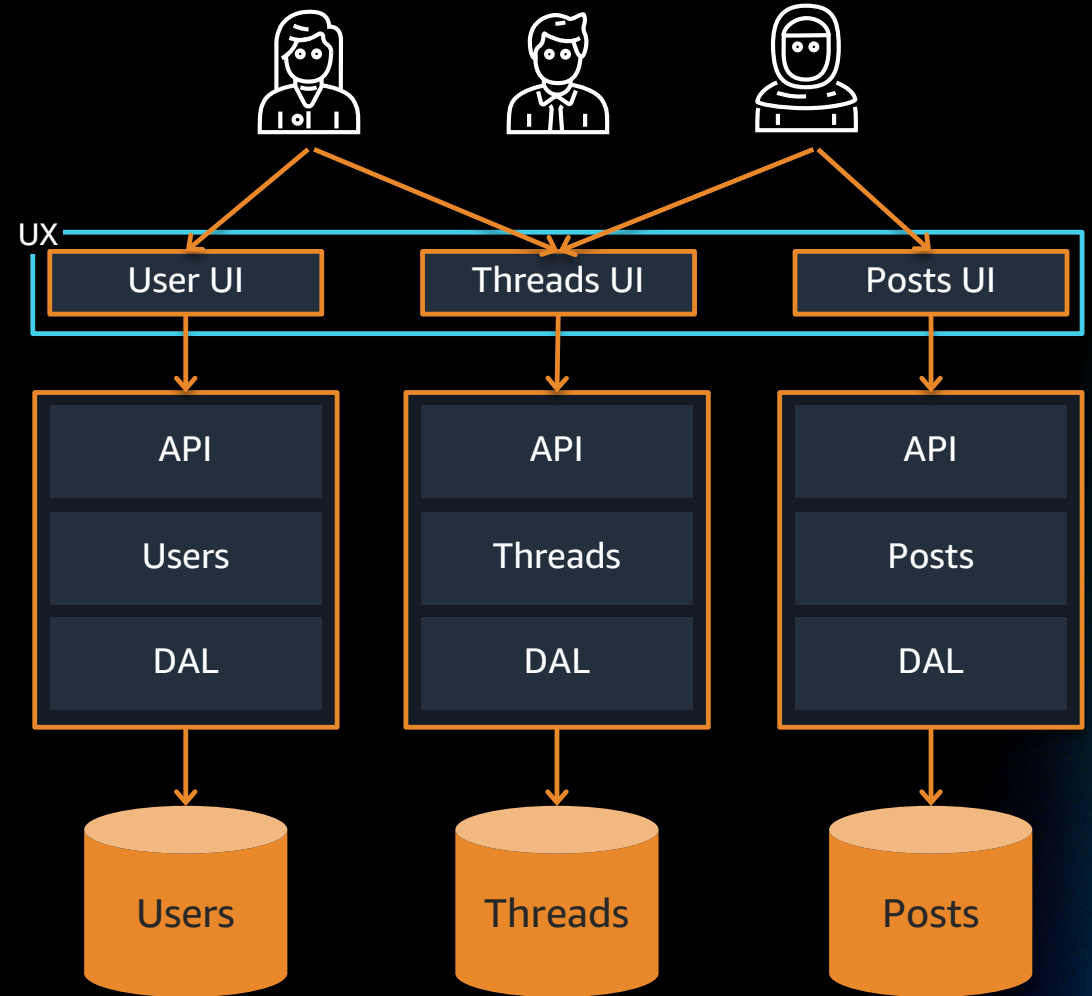
Application Architecture: Modular Microservices



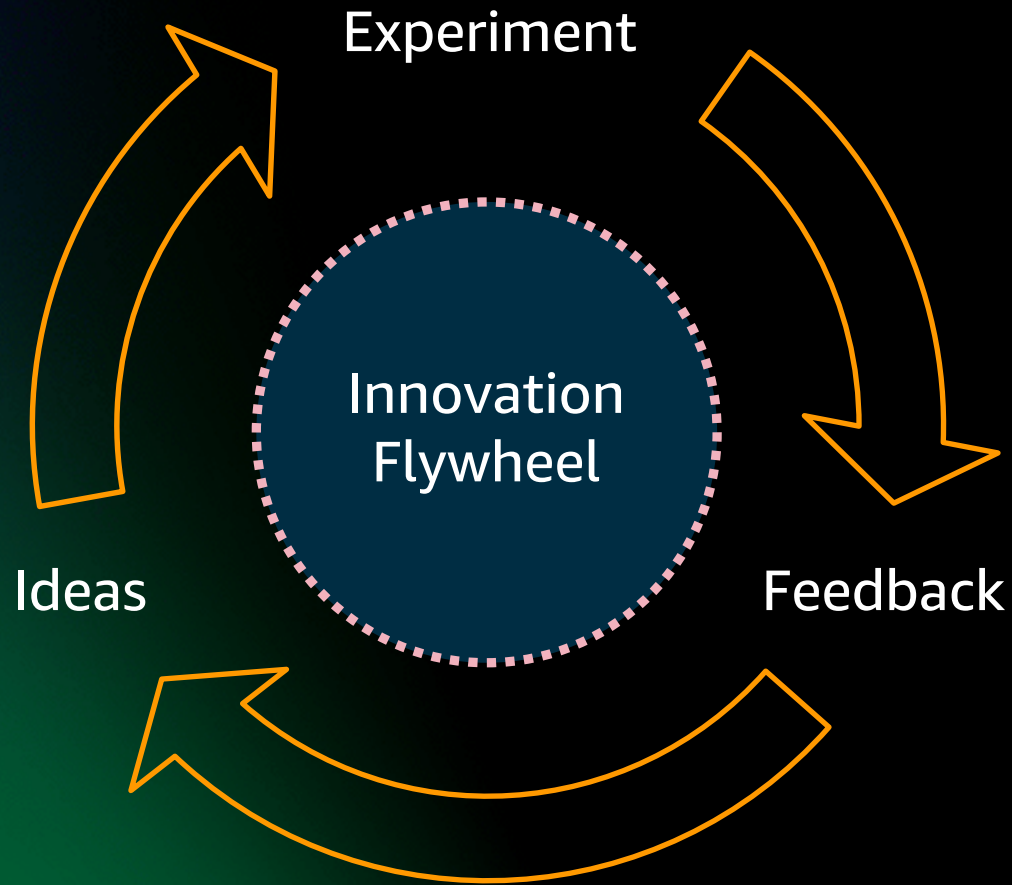
Monolith



Microservices



Microservices Advantages



Implications for IT

Modular Architectures
Faster Release Cycles
Smaller Units, Lower Risks
Continually Improving Systems
Data Driven Insights
Automation

Modernize: Refactor and Re-platform

Reduce the size of
your estate*



Retire



SaaS

Move to AWS



**Lift and
Shift**

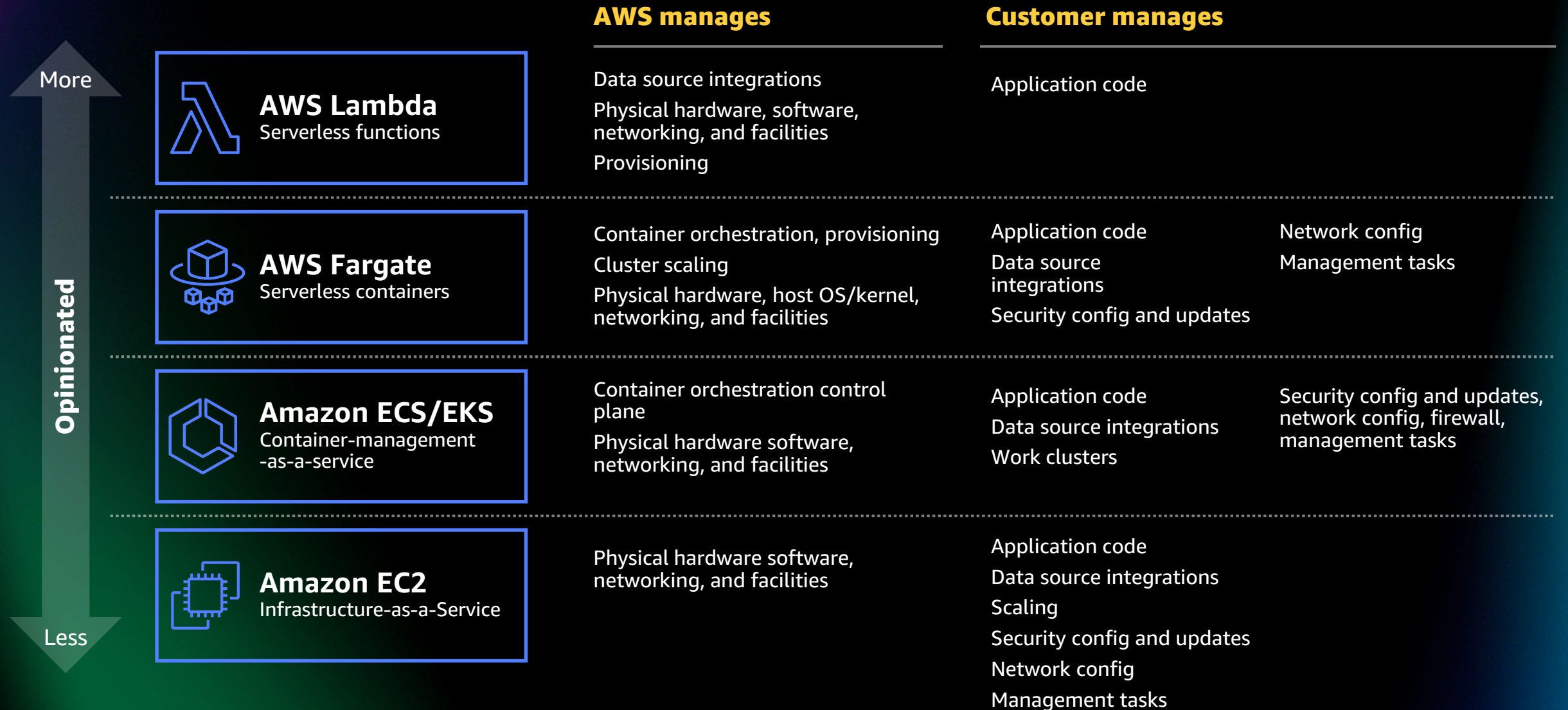


Refactor













Re-platform

Compute and Operations



Similarities in approaches

	Containers	Serverless
Abstraction from complexity		
Fully-managed by AWS		
Broad ecosystem of partners		
Support wide range of use cases and workloads		
Deep integration with AWS infrastructure, security, and management services		

Differences in approaches

Containers

- ✓ Compute-oriented
- ✓ More easily manage infrastructure
- ✓ Infrastructure consumption-based pricing

Serverless

- ✓ Event-oriented
- ✓ Abstract away infrastructure
- ✓ Request-based pricing

Many customers run both!

Most customers use a combination

80%

of AWS container services customers
have also adopted Lambda



Why customers choose AWS Lambda

1

Desire or need to get applications and features to market rapidly

2

They have teams that focus primarily on code - not operations

3

No limitations from existing instance or container platforms

What does serverless mean?



**No infrastructure provisioning,
no management**



Automatic scaling



Pay-for-use



Highly available and secure

Common use cases



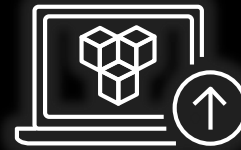
**IT
automation**



**Data
processing**



**Event-Driven
Architectures**



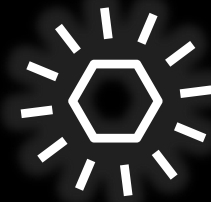
**Web
applications**



**Machine
learning**



AWS Lambda
Event-driven
serverless
compute



Event
A signal that
status has
changed

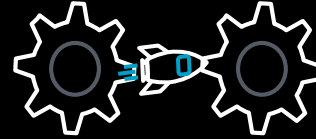
What makes an application “event-driven?”



An ‘event’ is simply
a change in state



Events trigger and
communicate between
decoupled services



EDAs consist of a
producer, a router, and
a consumer



Decoupled services can be
scaled, updated, and
deployed independently

High volume data produced continuously from a large variety of sources at a high velocity



Mobile apps



Web clickstream

```
[Wed Oct 11 14:32:52  
2018] [error] [client  
127.0.0.1] client denied  
by server configuration:  
/export/home/live/ap/htd  
ocs/test
```

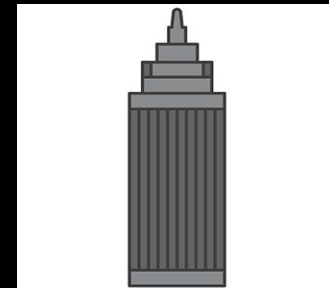
Application logs



Metering records

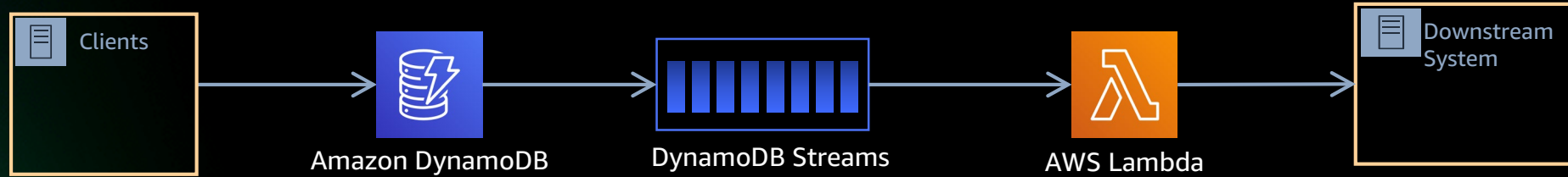
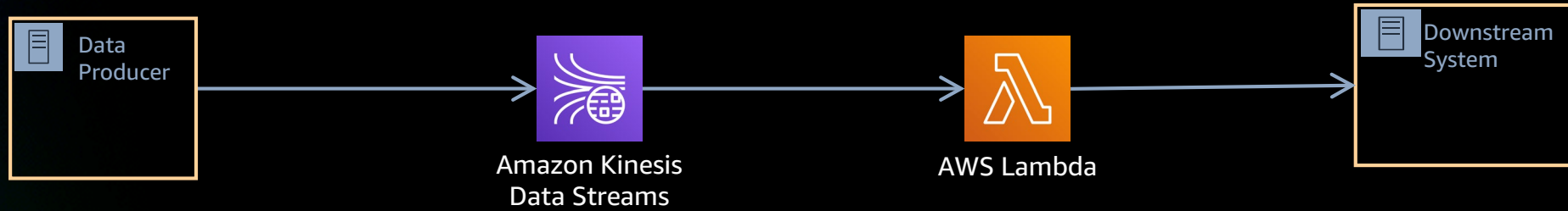


IoT sensors

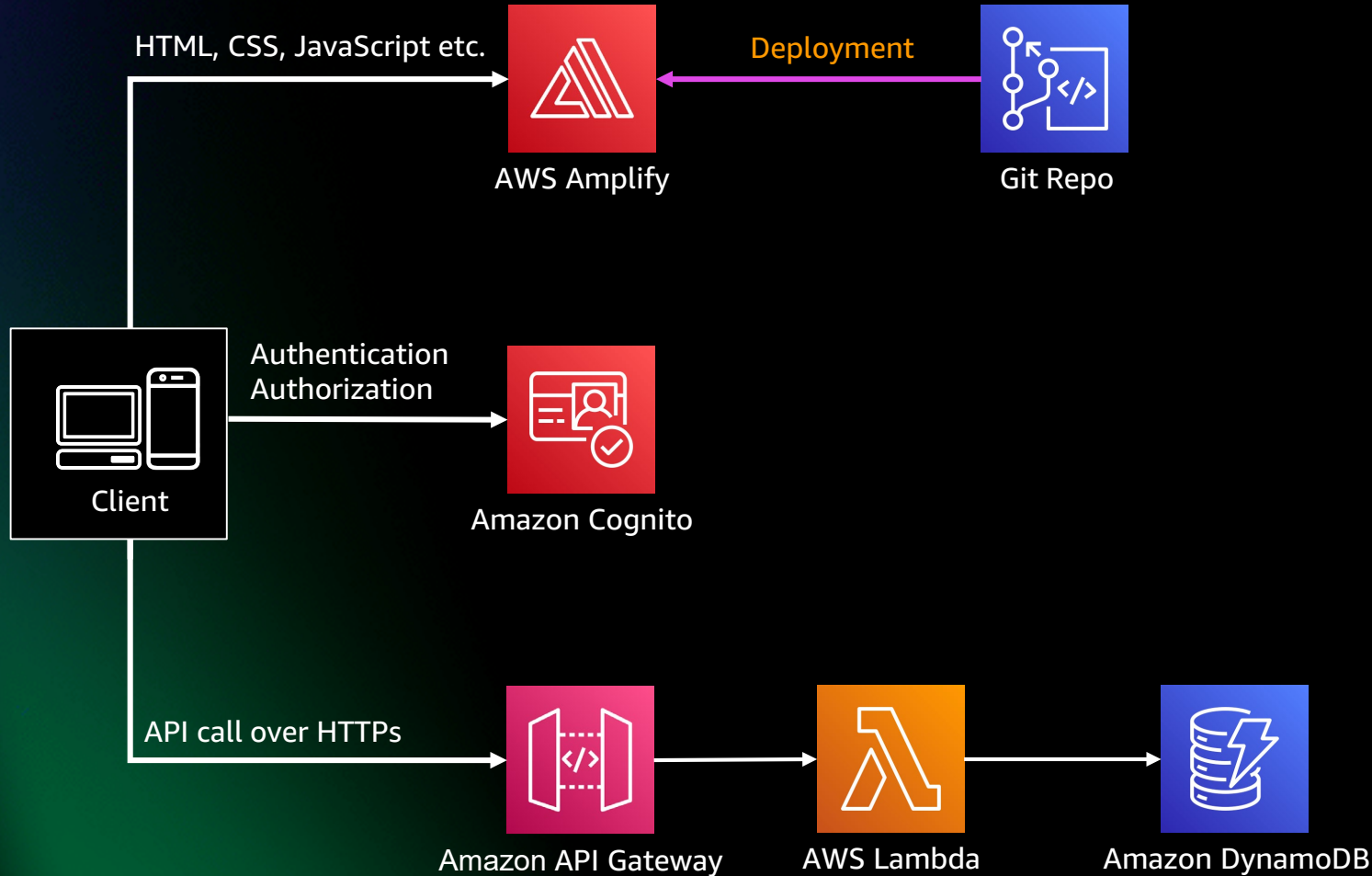


Smart buildings

Serverless Stream Processing



Serverless Web Applications



Static Web Hosting

AWS Amplify

HTML, CSS, JavaScript, and Image
SPA (React, Angular, VUE)

Server-side rendering (Next.js and Nuxt.js)

User Management

Amazon Cognito

user management

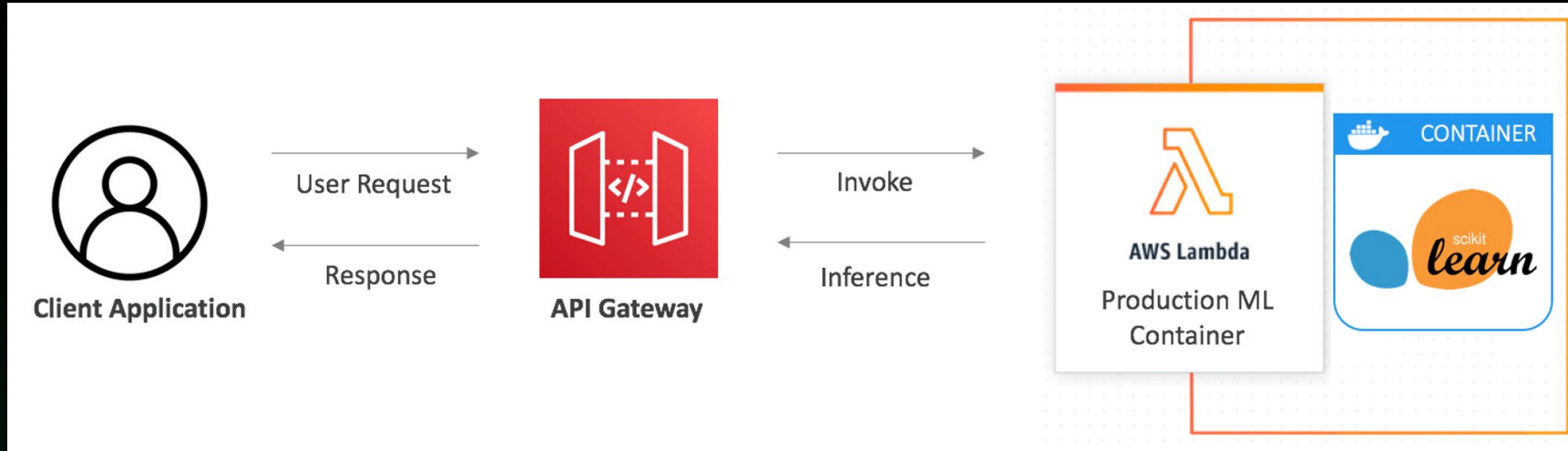
authentication for backend API

Serverless Backend

API Gateway, Lambda

public backend API built using
Lambda and API Gateway

Machine Learning in AWS Lambda



- Package Lambda functions as container images
 - This allows for larger code/dependencies: 10Gb
- SAM templates for machine learning make it easy to get started with popular frameworks
 - Pytorch, TensorFlow, SciKit-Learn, XGBoost

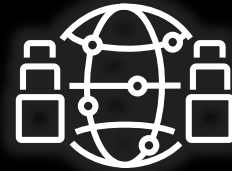
Why customers choose containers



**Familiarity or
preference—you
know what you like!**

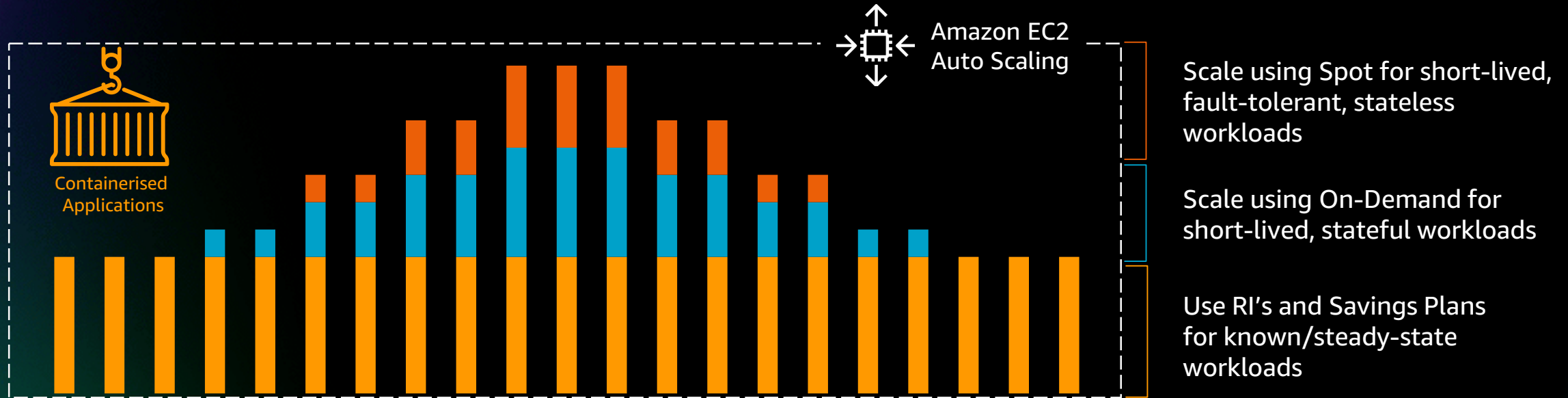


**Portability and
community support**



**Specific requirements
for managing
and configuring
your infrastructure**

Scale automatically, on demand..



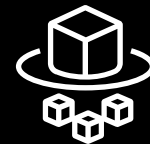
AWS CONTAINER SERVICES MAKE THIS EASY AND EFFICIENT



Amazon ECS



Amazon EKS



AWS Fargate

Choosing your container environment



Amazon ECS

Powerful simplicity

- Fully managed containers orchestration
- Opinionated solution for containers
- Reduced time to build and deploy
- Fewer decisions needed



Amazon EKS

Open flexibility

- If you are invested in Kubernetes
- Vibrant ecosystem and community
- Consistent open-source APIs
- Easier to run K8s resiliently and at-scale



AWS Fargate

Serverless

- No servers to manage
- Pay only for resources when used
- Eliminate capacity planning
- Supports both Amazon EKS and Amazon ECS

Many customers run a mix of all three!

Powerful simplicity



Amazon ECS

AWS-opinionated way to
run containers at scale

Reduce decisions without
sacrificing scale or features

Reduce time to build, deploy,
and migrate applications

Open flexibility



Amazon EKS

Gain agility and efficiency with AWS-optimized Kubernetes, and standardize operations everywhere

Secure, highly available, with observability across all Kubernetes deployments

Build with choice of solutions from the broader community around Kubernetes

Operating containers at scale is challenging

Security

Do we have vulnerabilities on our hosts?

Maintenance

How are we handling ongoing AMI management, logging, & monitoring?

Capacity

Is the size of our cluster properly sized and can we scale as-needed?

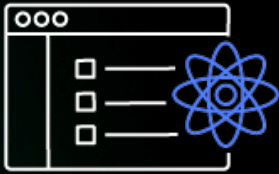
Cost

Are we being efficient with our spend?

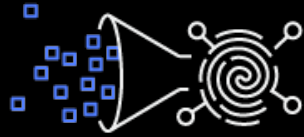
Focus

Do we spend more time on our infrastructure than our applications?

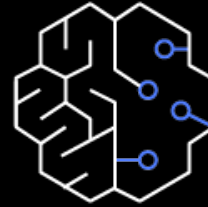
Containers are used for a wide variety of use cases



Web Applications



Data Processing



Machine Learning



CI/CD



Mobile Applications



Gaming Platforms

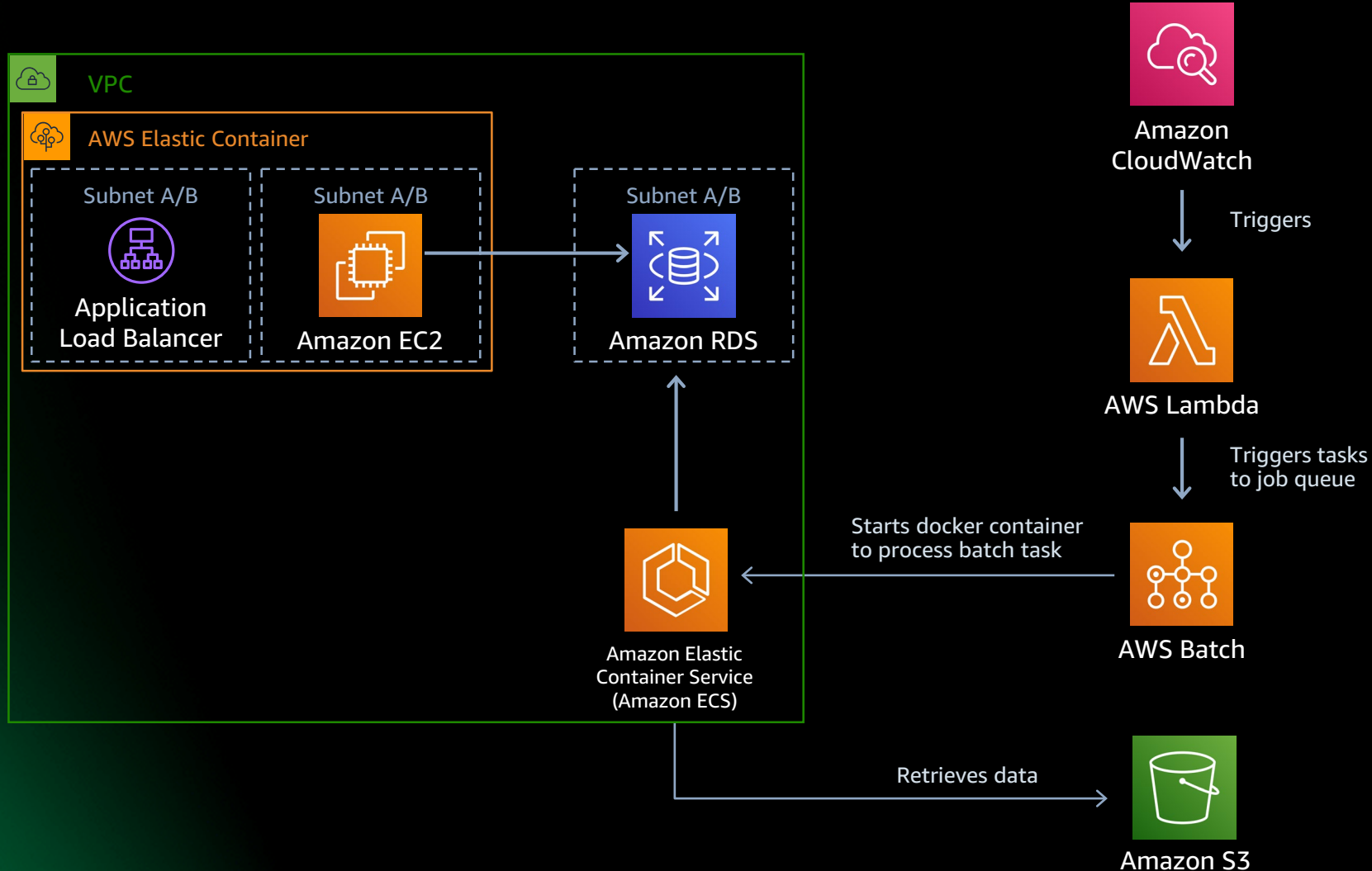


Platform as a Service (PaaS)



Internet of Things

Bigger benefits when working together !





**The only constant
is change**

Businesses today
face unprecedented
business challenges
**BUT they also have
incredible opportunities
to reinvent themselves.**

Visit the Modern Applications resource hub

Dive deeper with these resources to help you develop an effective plan for your modernization journey.

- Build modern applications on AWS
- Business value of cloud modernization
- An introduction to event-driven architectures
- Accelerate full-stack web and mobile app development
- Determining the total cost of ownership: Comparing serverless and server-based technologies
- Building event-driven architectures with AWS
- Continuous learning, continuous modernization



<https://tinyurl.com/modern-apps-aws>

Visit resource hub

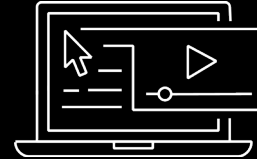


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Thank you!