



Accelerate Organization-Wide Modernization by Enabling Cloud Center of Excellence (CCOE)

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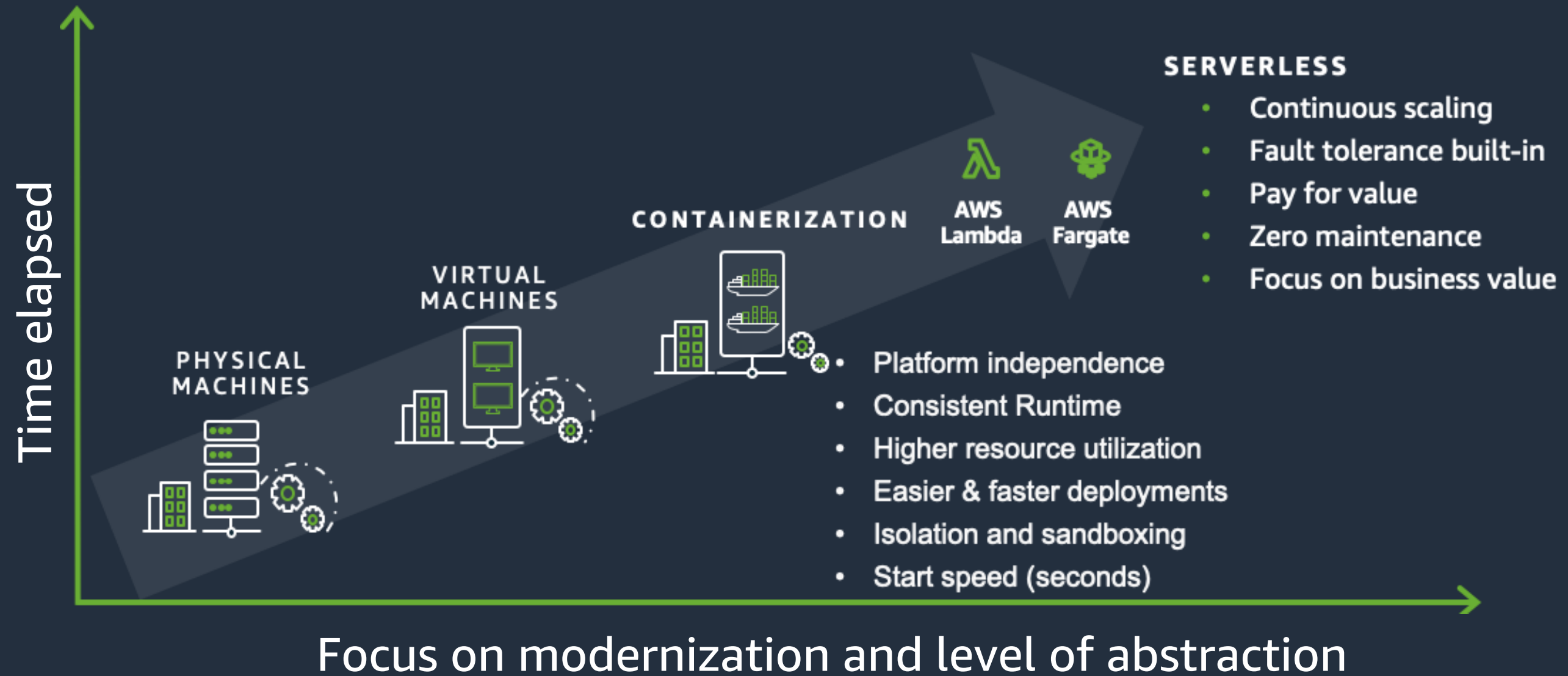
Agenda

- Evolution of a Modernization Strategy
- The Role of a Cloud Center of Excellence (CCOE)
- Key Operating Principles and Guardrails
- Next Steps

Evolution of a Modernization Strategy



Compute evolution - A paradigm shift for Modernization



Modern Application strategy enables maximum value of cloud

AWS Serverless and Container Services

- ✓ Focus on business differentiators
- ✓ Cost benefits
- ✓ Faster time to market
- ✓ Resilient operating model



Lambda



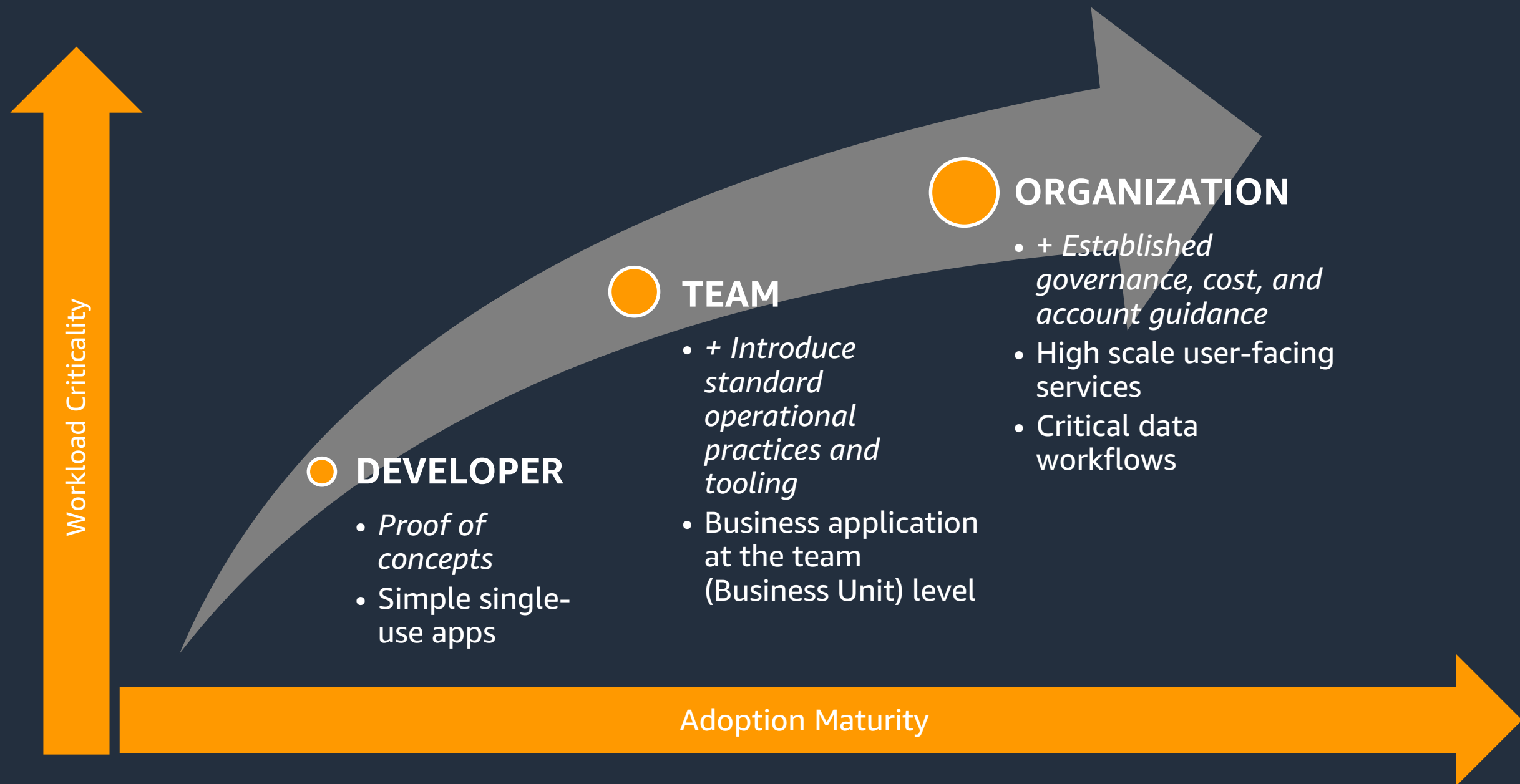
ECS on Fargate



EKS

Modern Application Strategy is the decision to opt for cloud native technologies (serverless and container services) in your application as a first choice.

Evolution of an organization-wide modernization strategy



Drive organization-wide strategy through Executive Sponsorship

Organizational direction

Vision setting

Focus on innovation

Organization changes



Customers building modern applications



Built an integrated experience with Netflix in **just 4 months**; enables their teams to move faster and attract the best talent, while also cutting costs



Launched new features in weeks and reduced the time to build new application infrastructure by more than **99 percent**



Built and launched Home Delivery in **less than 4 months**; scales to 20,000 orders per second with less than 100ms latency



Migrated integrated communication system and **reduced costs over 65 percent**, while increasing requests over 3x to 80 million calls per month



Run experiments quickly and cheaply, reducing **costs of analysis by 90 percent** and **time of analysis by 95 percent**

Liberty Mutual – A Serverless-first strategy across organization



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2016

The Future of Cloud is Serverless

We will continue to build our skill set to include serverless architecture. In so doing, we will shift more of our operational responsibilities to AWS, increase our agility, and build capacity for innovation. Serverless eliminates infrastructure management tasks such as server and cluster provisioning, patching, operating system maintenance, and capacity provisioning. Serverless architecture can be used for nearly any type of application or backend service; everything required to run and scale our applications with high availability will be handled for us.

2019

Technical Authority

We focus on high business value problems across Liberty Mutual via our serverless first approach and AI/ML

2020

The leadership narrative pointed to serverless-first and gave engineers a vision.



Liberty Mutual - Early wins



Virtual Assistant

Serverless NLP system takes over 200K calls/month at \$0.04 per call



Financial Central Service

Processes 100M transactions per month (\$60 per 1 million for AWS Step Functions)



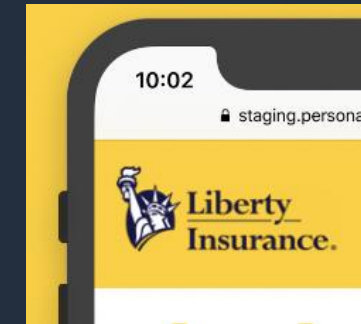
ID3E Intelligent Documents

Innovative AI system for “document understanding” built in 12 weeks



WorkGrid Digital Assistant


Entire serverless-first company built by 8 engineers with enterprise compliance



Global Digital Ecosystem

Driving a global book of business while we use serverless to reduce operational burden

What is the Role of the Cloud Center of Excellence (CCOE) for Cloud Native Workloads?

A decorative graphic on the right side of the slide consists of several concentric circles in shades of orange and red. Three curved arrows are overlaid on these circles: one pointing upwards and to the right, one pointing downwards and to the right, and one pointing upwards and to the left.

Questions from teams

How do you
authenticate users

What IDE should I
be using?

How do I get
started?

Developers

What architecture
pattern is best
suited for a use
case?

How to develop
well architected
solutions?

Architects

How does DevOps
and CI/CD change
for modern
applications?

DevOps

How do you
enable security
controls for
loosely coupled
microservices?

How do you
enable
development
teams?

Security

Assemble a CCOE team

Established CCOE

Expand the scope to
Serverless and Containers

Chaos

No CCOE today

Establish a team by
recruiting influential
members



Security

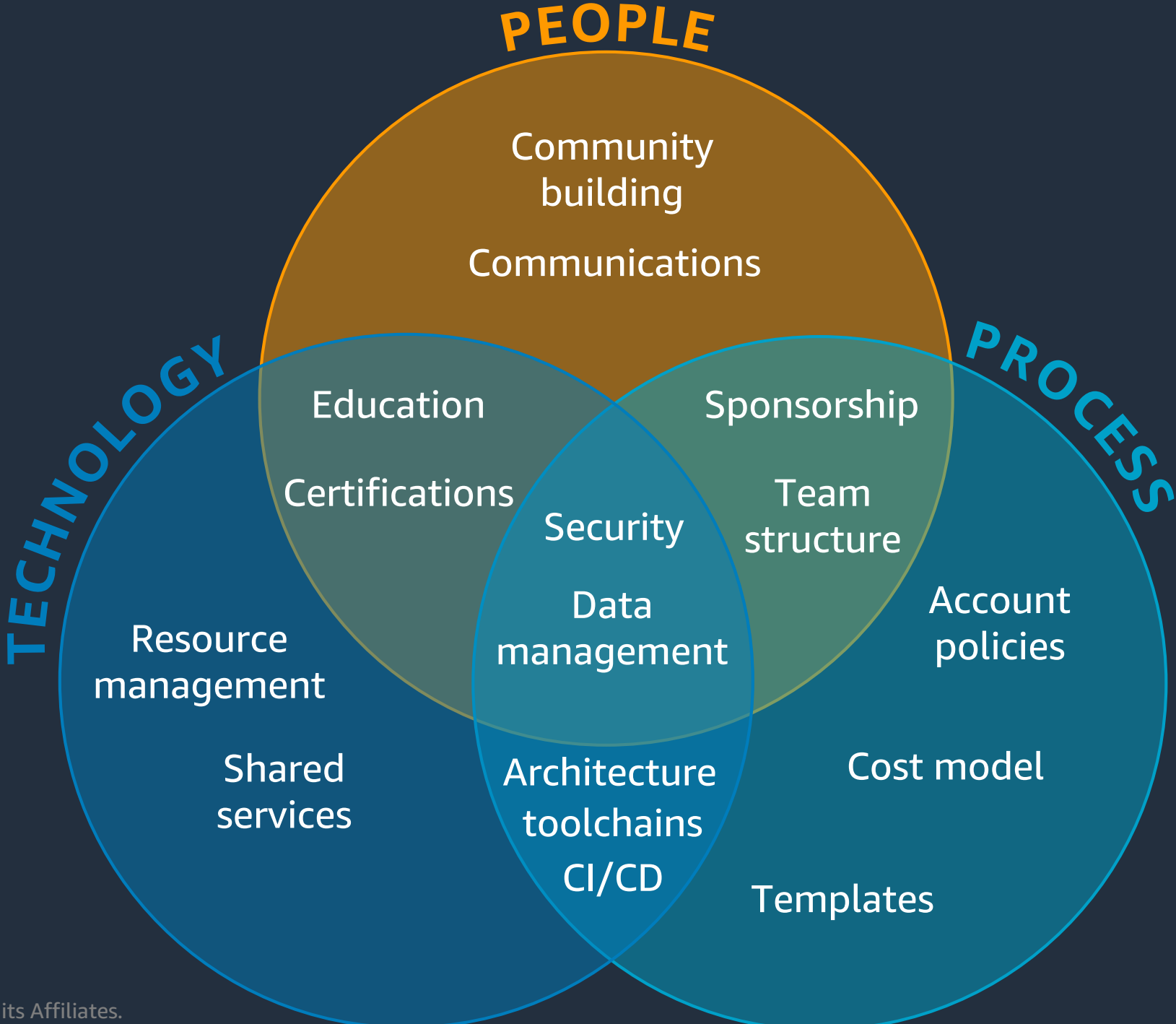
Devops

Architecture

Infrastructure

Database

The role of the CCOE



Role of the CCOE team



People

Sponsorship

Education

Certification

Communication

Community Building

Role of the CCOE team



People

Sponsorship

Education

Certification

Communication

Community Building



Technology

Standardization of tools

Guardrails

Best Practices

Re-usable patterns / templates

Shared Services Architecture

Role of the CCOE team



People

- Sponsorship
- Education
- Certification
- Communication
- Community Building



Technology

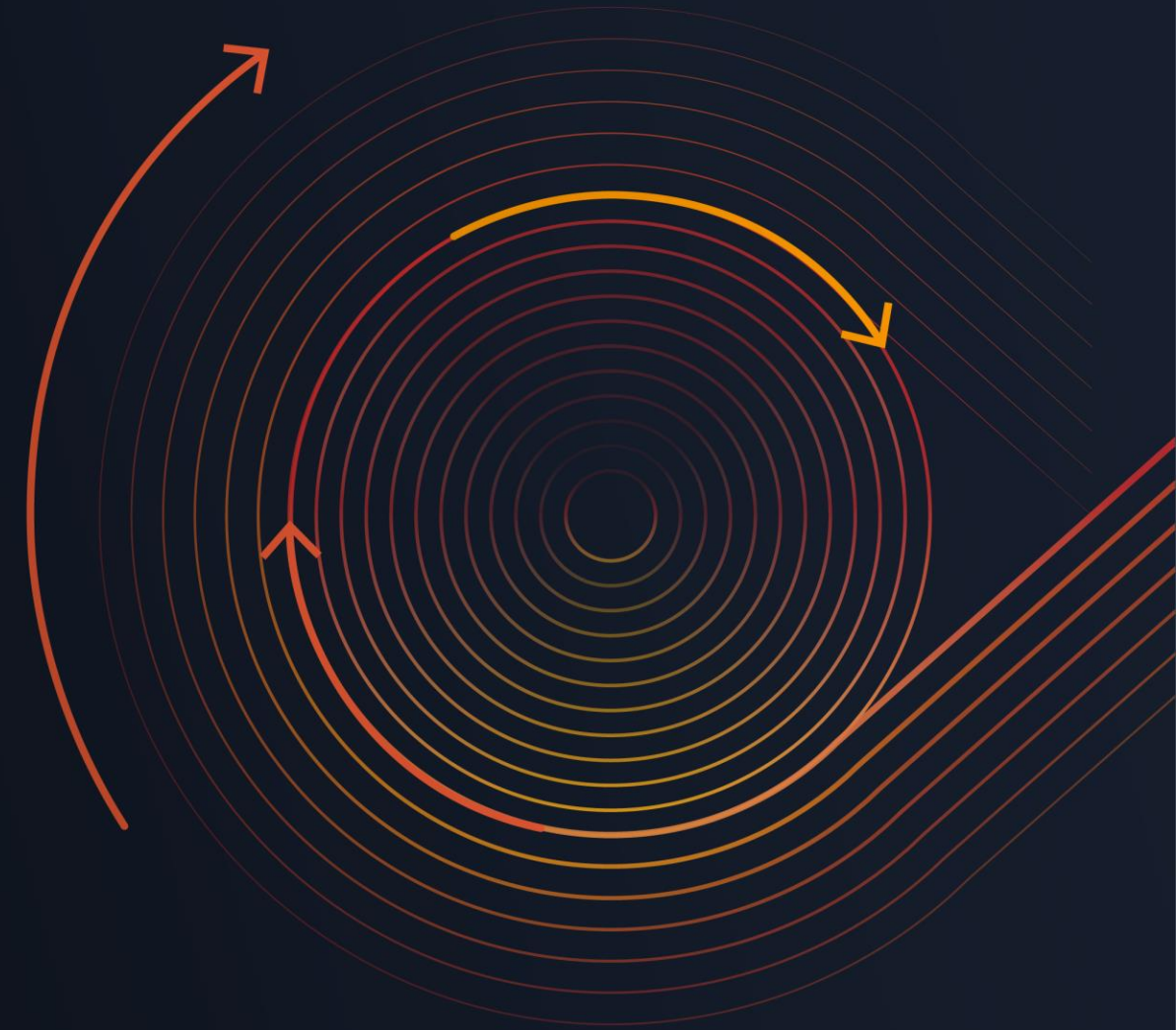
- Standardization of tools
- Guardrails
- Best Practices
- Re-usable patterns / templates
- Shared Services Architecture



Process

- DevOps and CI/CD Automation
- Testing automation processes
- Well-Architected Reviews (WARs)
- On-boarding curriculum and learning paths
- Team Structure
- Account strategy

Establish Operating Principles and Guardrails



Key operational guardrails

- Security and Compliance
- DevOps and Standardization on a CI/CD development framework
- Observability, Monitoring and Logging
- Iterative Application Modernization
- Cost Management

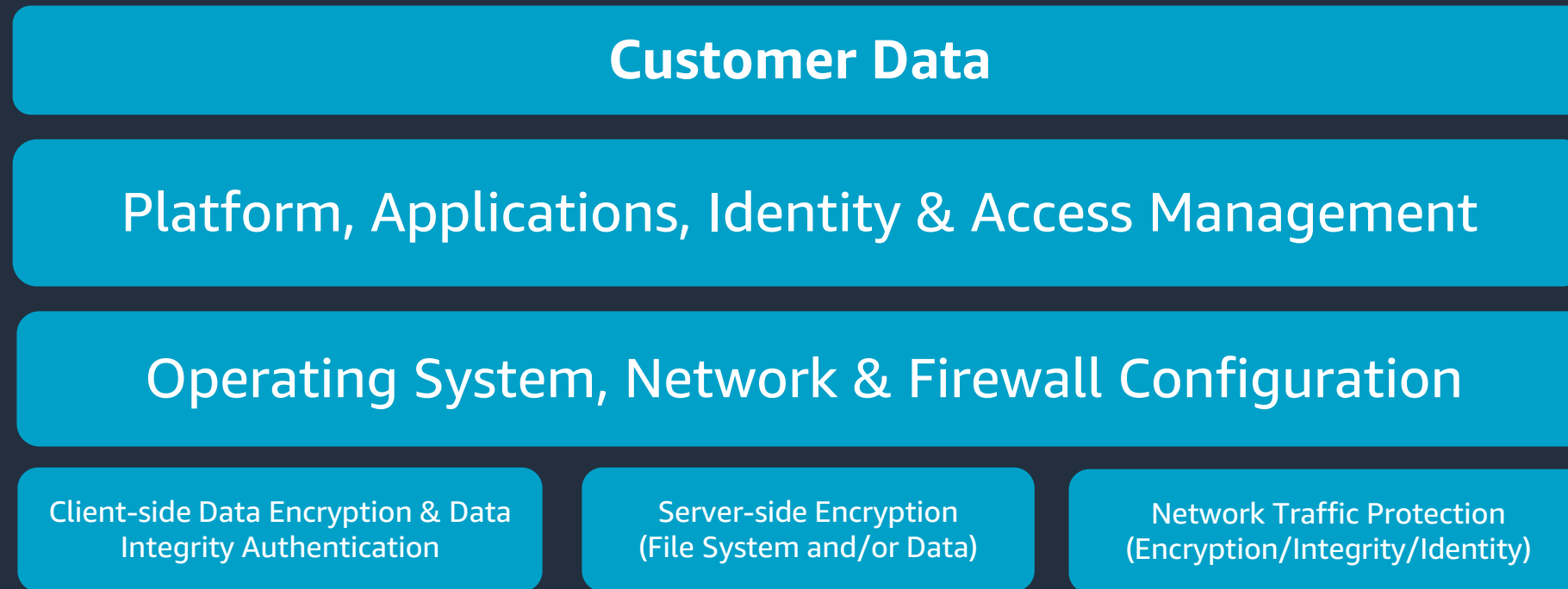
Security and compliance

- Security is an integral part of the CCoE
- “Build guardrails, don’t be gatekeepers”
- Security and Compliance is a shared responsibility mode between AWS and the customer



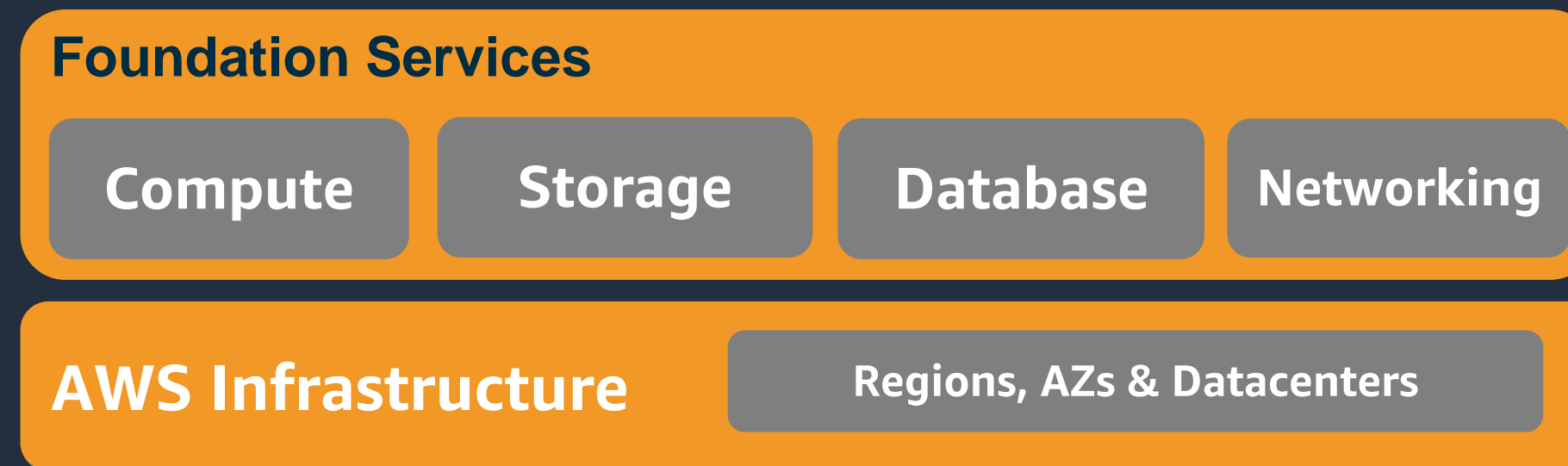
Responsibility for security and compliance is shared

Customer



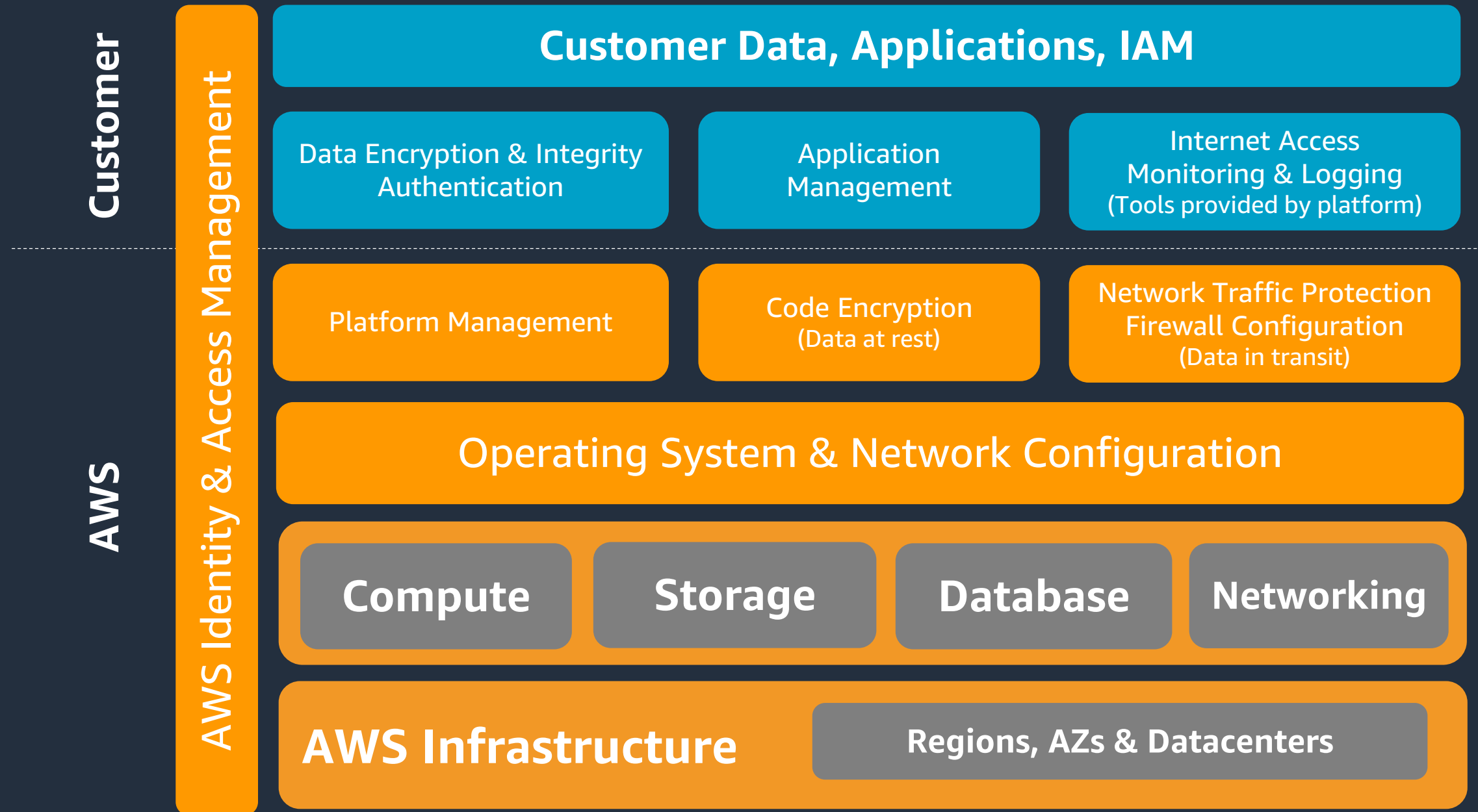
Customers are responsible for their security and compliance **IN** the Cloud

AWS



AWS is responsible for the security **OF** the Cloud

When you build a modernized application on AWS, AWS takes a greater share of responsibility



Security and compliance considerations

How do you manage authentication for people and machines?

How do you manage permissions for people and machines?

How do you detect and investigate security events?

How do you protect your network resources?

How do you protect your compute resources?

How do you classify your data?

DevOps automation and standardization



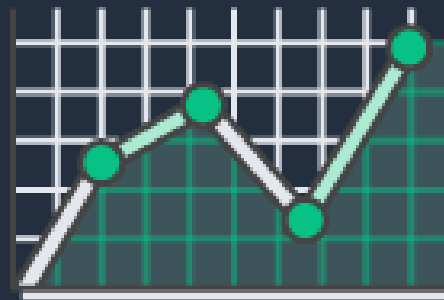
Improved
Collaboration



Security



Rapid Delivery



Scale



Reliability



Speed

Continuous Integration Continuous Deployment (CI/CD)



Continuous integration

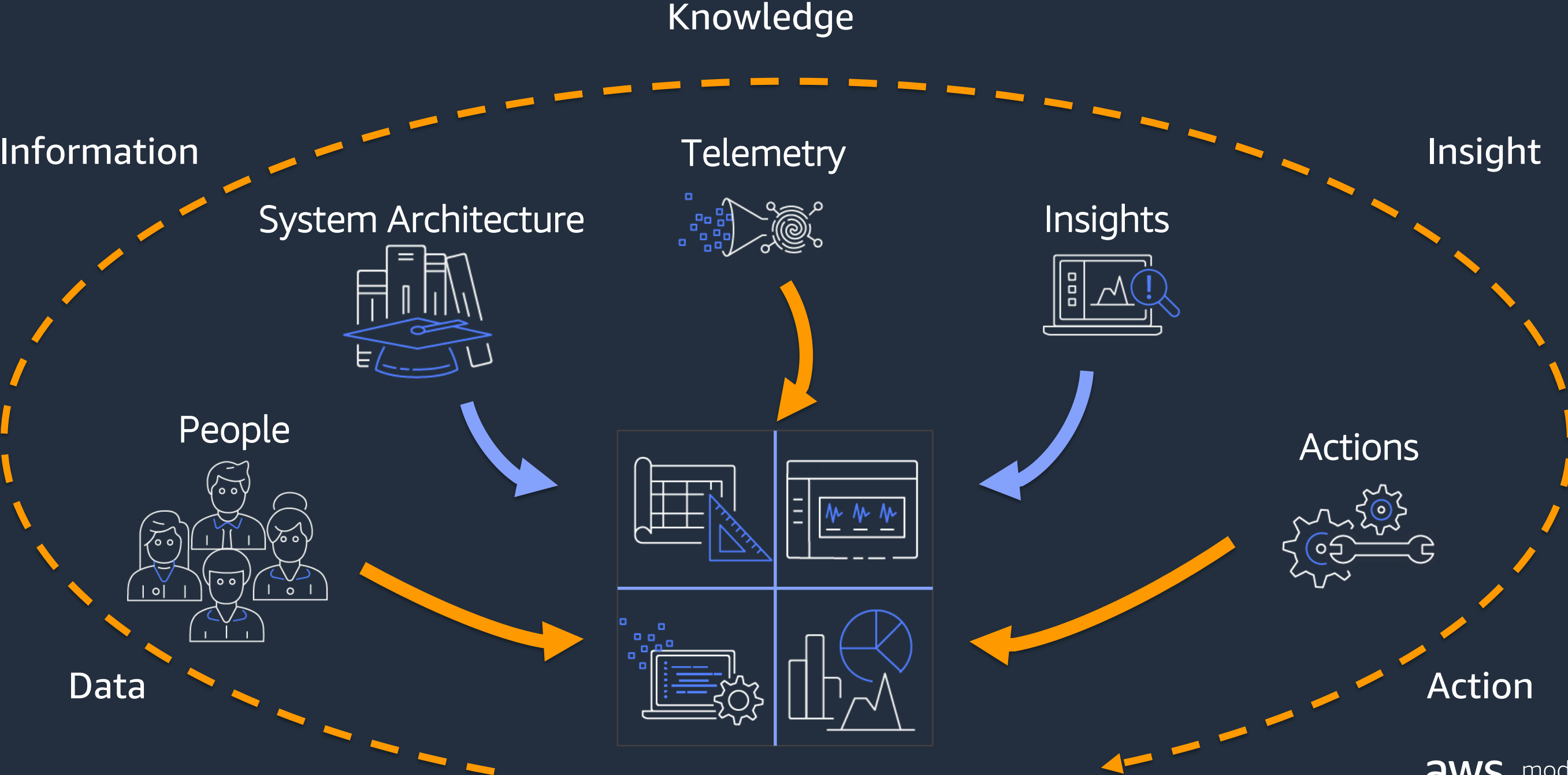
Continuous delivery

Continuous deployment

DevOps and CI/CD considerations

- Provide guidance and training to adopt CI/CD tools
 - Evaluate tooling across the entire development lifecycle
 - Choose the right framework for the business need / use case
 - Increase value of integration testing
- Provide guidance on the process changes with app modernization
 - Gradual/canary deployments
 - Automate Lambda right sizing(Lambda Power Tuning) in the pipeline
 - Automatically review workload's code dependencies
 - Automate testing and validation of security controls in pipelines
 - Automated end-to-end load tests

Observability, monitoring and logging



AWS observability tools

What: Immutable, timestamped record of discrete events that happened over time

Why: Useful for uncovering emergent and unpredictable behavior



CloudWatch Logs

AWS observability tools

What: Representation of a series of related distributed events that encode the end-to-end request flow through a distributed system

Why: Provides visibility into both the path traversed by a request as well as the structure of a request



X-Ray traces



CloudWatch metrics

What: Numeric representation of data measured over intervals of time

Why: Useful for identifying trends, mathematical modeling, and prediction

Observability and monitoring considerations

- ✓ Record performance-related metrics
- ✓ Build dashboards to bring together important metrics across an application
- ✓ Establish business level KPIs to measure workload performance
- ✓ Review metrics at regular intervals
- ✓ Monitor and alarm proactively
- ✓ Instrument your applications for logging and tracing(Lambda Powertools for example)
- ✓ Build metrics dashboards and alarms into Infrastructure as Code

Iterative Application Modernization

Monolith to Microservices

Move to a Microservices-based Architecture

Handle both Data tier and App tier

We are heavily dependent on the application
How do we get there safely?

Martin Fowler's Strangler Pattern

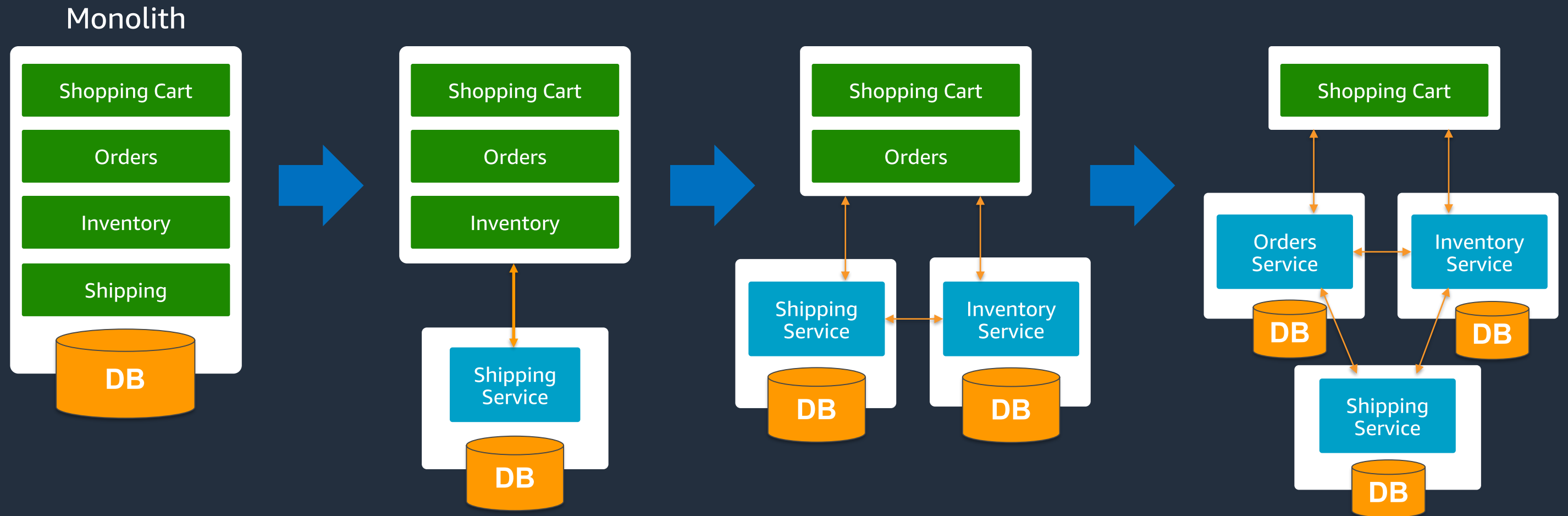


"...gradually create a new system around the edges of the old, letting it grow slowly over several years until the old system is strangled."

*Martin Fowler
June 29, 2004*

Iterative Application Modernization pattern

Retail App Example Breaking down the monolith (data tier and app tier)



Iterative App Modernization considerations

- Assist development teams by providing reusable patterns
 - Conduct Well Architected Review with AWS
- Application Portfolio Assessment
 - Which apps to modernize?
 - Which apps to incrementally modernize?
 - Which apps to maintain?
- Application Modernization Workshop
 - A hands-on lab to get teams familiar with these concepts

Cost management

See



Measurement and
accountability

Save



Cost Optimization

Plan



Planning and
Forecasting

Run



Cloud Financial
Operations

Cost management considerations



See

Measurement and Accountability

Implement org. wide account structure

Distribute business KPI's and cost reports to functional owners

Drive cost aware cloud consumption



Save

Cost Optimization

Identify and eliminate waste

Choose the best purchase option

Evolve with new cloud offerings



Plan

Planning and Forecasting

Dynamic budgeting and forecasting

Estimate workload costs

Quantify cloud business value



Run

Cloud Financial Operations

Obtain executive sponsorship for a Cost Management function

Align stakeholder understanding of cost

Implement cloud guardrails

Actions we recommend

1

Schedule an Executive EBC

2

Establish a CCOE team

3

Launch pilot projects in parallel of CCOE enablement

4

Engage your AWS account team, Compute Specialist teams and partners