AWS Serverless & Containers Workshop

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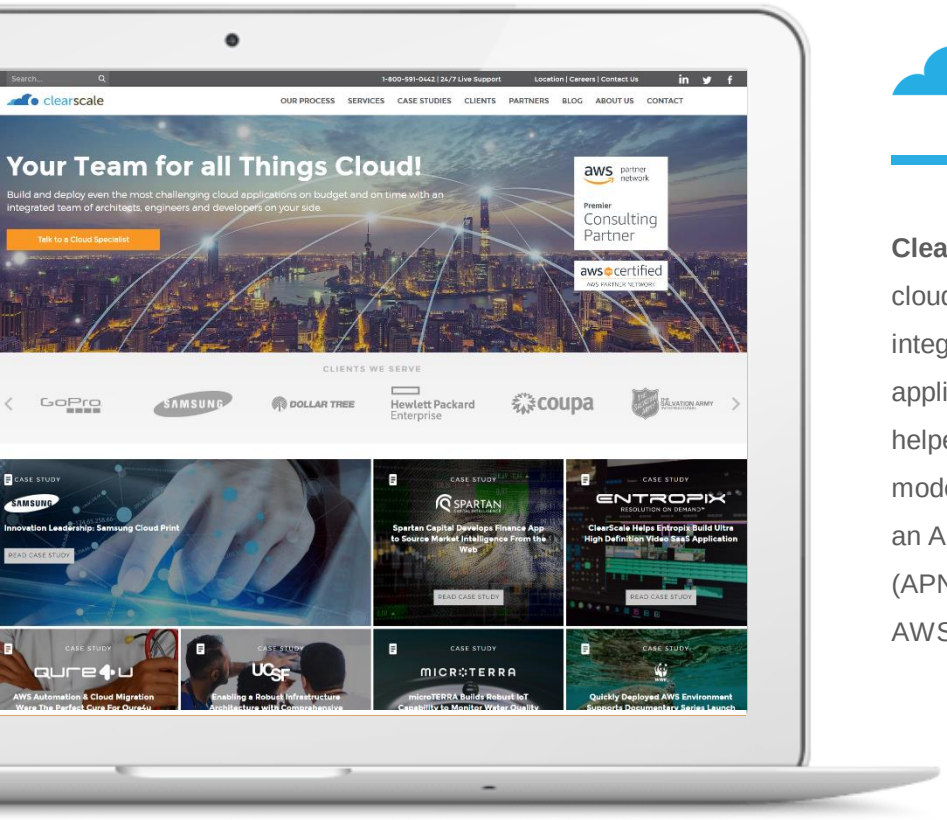


clearscale

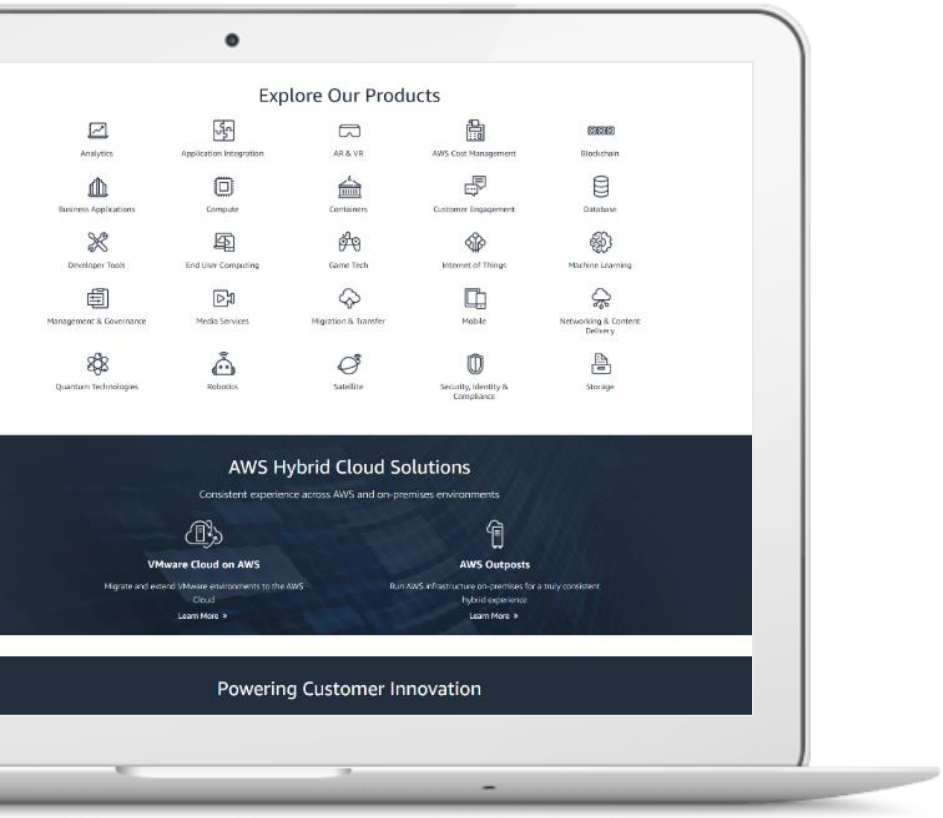
ClearScale is a leading provider of professional cloud services, including architecture design, integration, automation, management, and application development. The company has helped hundreds of businesses migrate and modernize legacy applications. The company is an Amazon Web Services Partner Network (APN) Premier Consulting Partner with eleven AWS competencies.

aws certified
AWS PARTNER NETWORK

aws partner network

Premier
Consulting Partner

- Migration Competency
- DevOps Competency
- Microsoft Workloads Competency
- HealthCare Competency
- Education Competency
- Data & Analytics Competency
- SaaS Competency
- Nonprofit Competency
- IoT Competency
- Mobile Competency
- Machine Learning Competency



Build and run applications without thinking about servers on AWS. Serverless is a way to describe the services, practices, and strategies that enable you to build more agile applications so you can innovate and respond to change faster. With serverless computing, infrastructure management tasks like capacity provisioning and patching are handled by AWS, so you can focus on only writing code that serves your customers. Serverless services like AWS Lambda come with automatic scaling, built-in high availability, and a pay-for-value billing model. Lambda is an event-driven compute service that enables you to run code in response to events from over 200 natively-integrated AWS and SaaS sources - all without managing any servers.

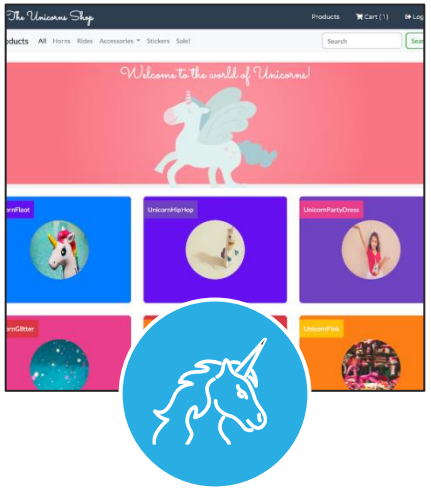
Workshop Agenda

SERVERLESS & CONTAINERS

Learn how AWS Containers and Serverless technologies accelerate development and deployment.

REAL WORLD EXAMPLES

Hear how Nielsen, Quora, Vidsy, FINRA, Coca Cola, Salvation Army, and SavvyMoney see success.



HANDS-ON LABS

Step into the world of young startup called “Unishop” and explore moving to a microservices-based architecture.

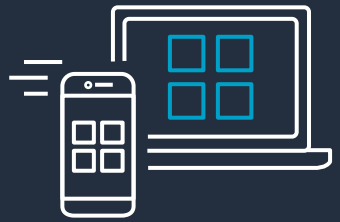
Application Modernization

Serverless & Containers

Agenda

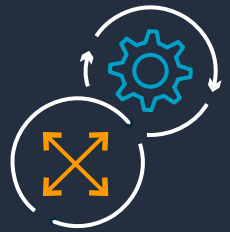
- Need for Modernization
- Architecture Evolution
- Choice of Compute
- Serverless and Containers
    - Architectural Considerations
    - Decision Trees
- Customer Success Stories

What do our customers need to drive success?



Get to market faster

Lower total cost of ownership



High performance and scalability

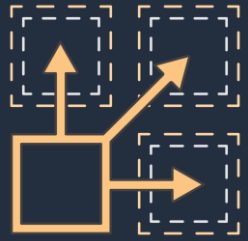
Security and isolation by design

CIO’s say that 80% of developers’ time is spent on the operations and maintenance of applications and only 20% of the time is actually spent on innovation

Source: Deloitte 2019

Pillars of Modernization

1



Technology & Architecture

Independent business functions

2

People, Process, & Culture

Organized for Value

3

Ops & Governance at Scale

Automate, Enable, & Self-service

Modernization is the refactoring of legacy technology by combining modern infrastructure, architecture, organization patterns together to maximize resiliency, engineering efficiency, and business agility.

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CLIENT EXPERIENCE ROI WITH ENTERPRISE MODERNIZATION WITHIN 36 MONTHS

We asked a sample of our customers across different industries to share their experience around how they quantified benefits and return on investment (ROI) to measure the business impact of Enterprise Modernization.

Source: The Total Economic Impact of ThoughtWorks Digital Transformation Services (2019)

"Customers realized an **88% ROI**

79% Improved speed-to-market

10% Reduced cost of legacy application maintenance

6% Reduced cost of new application maintenance

5% Accelerated customer onboarding

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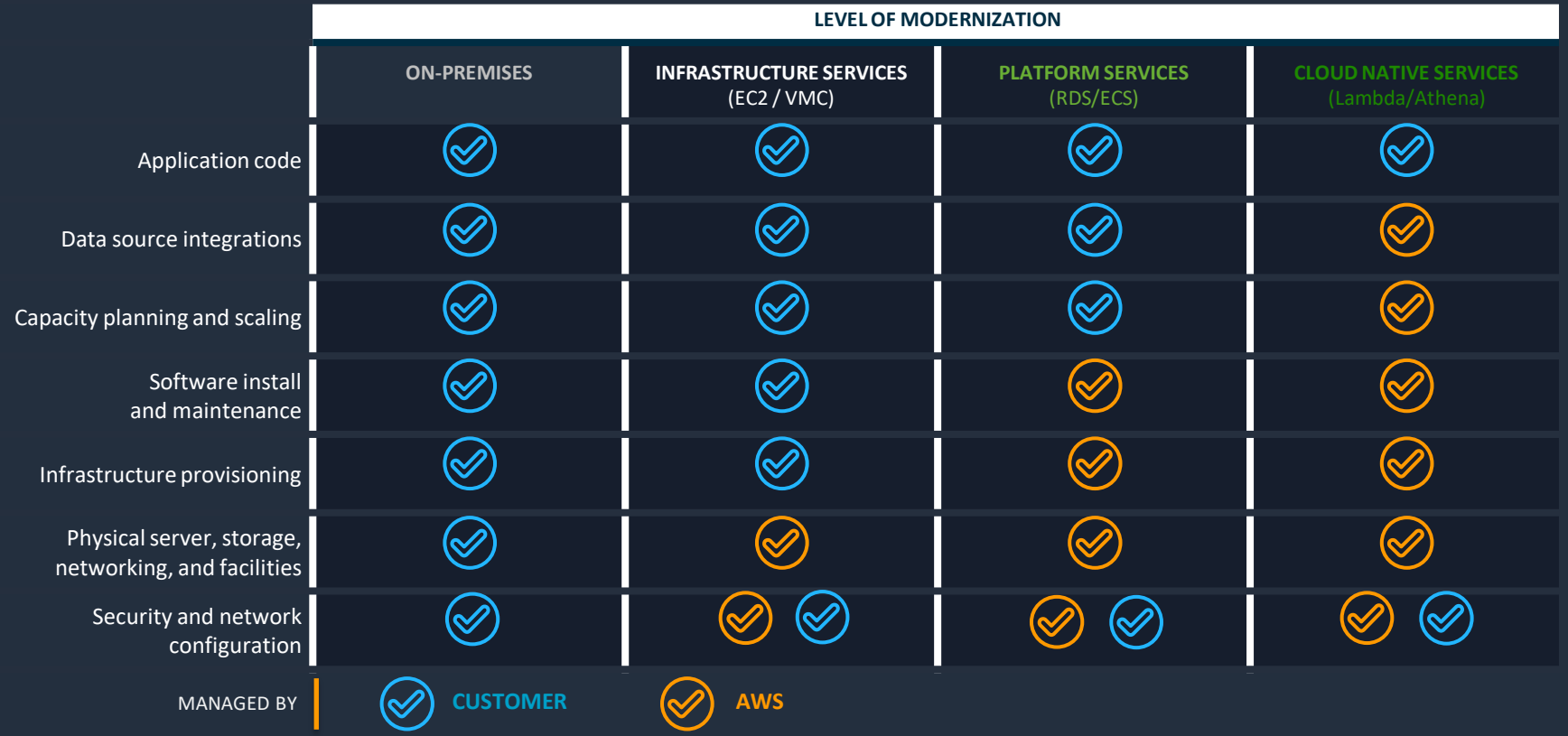
AWS operational responsibility models

	On-premises	Cloud				
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 Elasticsearch Service		Amazon Athena

Efficiency moves up with Modernization



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Customers who modernized

realized 409%

ROI

over five years

9	Months to payback
89%	Faster compute deployment
33%	Higher developer productivity
60%	Lower five-year cost of operations

Source: Generating Value Through IT Agility and Business Scalability with AWS Serverless Platform, IDC, 2018

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Architecture evolution

When the impact of change is small, release velocity can increase

Monolithic application

Does everything
Shared release pipeline
Rigid scaling
High impact of change
Hard to adopt new technologies

Microservices

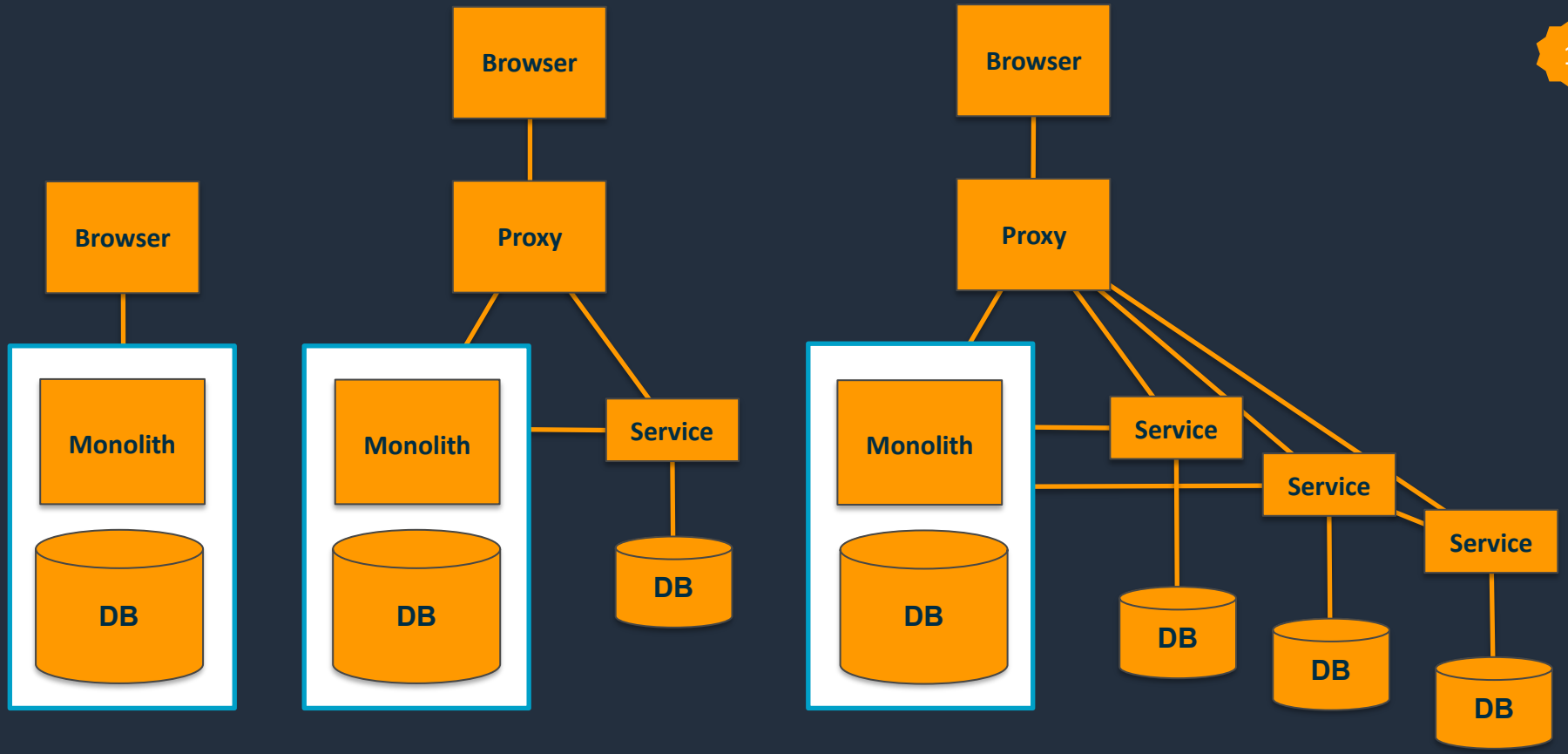
Does one thing
Independent deployments
Independent scaling
Small impact of change
Choice of technology

Martin Fowler’s Strangler Fig 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

Creating a new system around the edges



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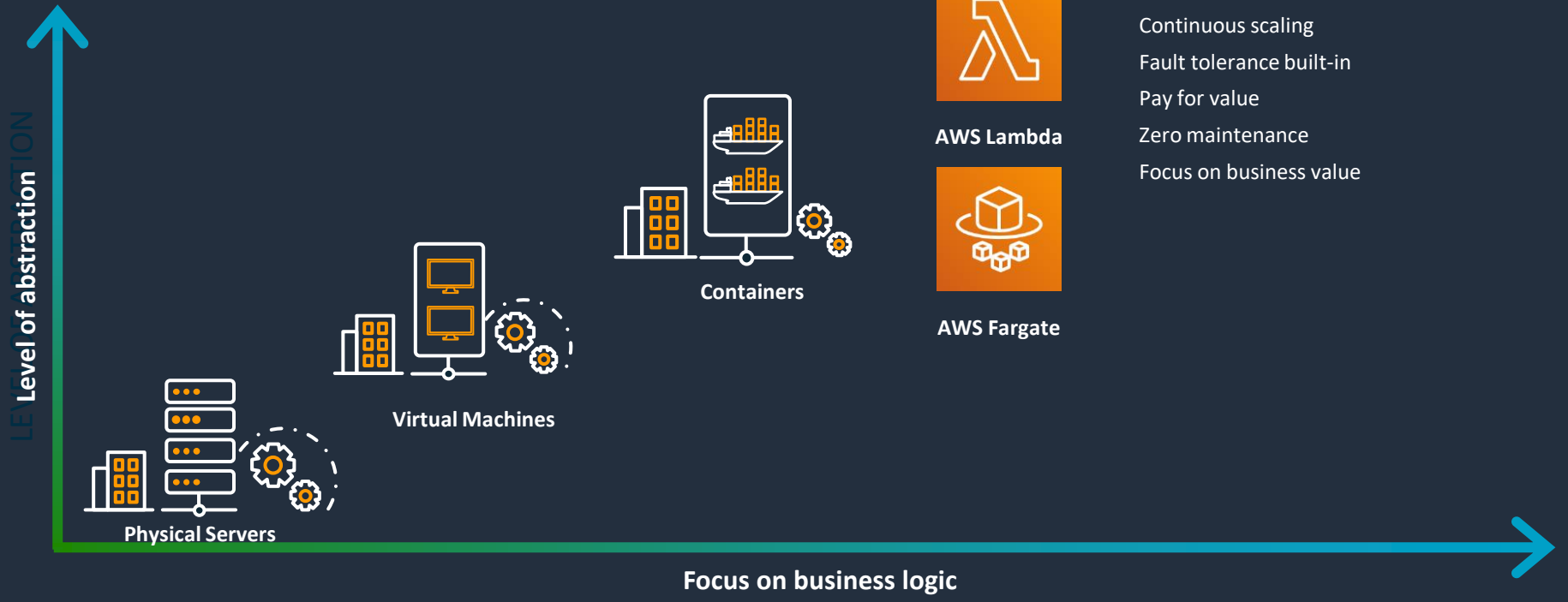
Computing evolution – A paradigm shift



Common use cases

IT automation

Data processing

Web / Mobile applications

Machine learning

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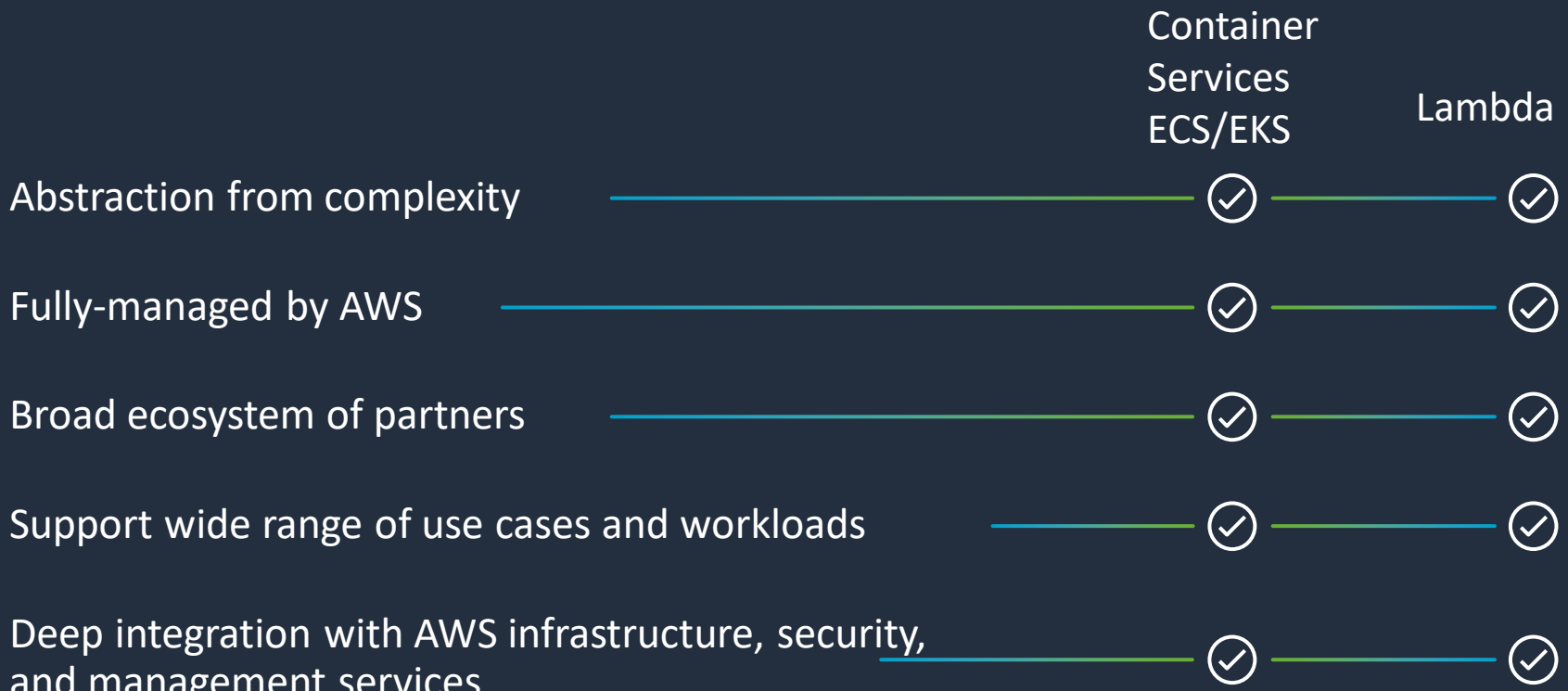
Similarities in approaches



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Differences in approaches

Container Services (ECS/EKS)

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

Lambda

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

Many customers run both!

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Most customers use a combination

80%

of AWS container services customers have also adopted Lambda

Source: Datadog State of Serverless, 2020

T-Mobile uses both containers and Lambda

T-Mobile

Jazz Platform:

Open-source serverless developer platform—now open-source

They use Lambda for customer-facing apps—for ongoing, always-on applications, they run Kubernetes

Reduced development time from weeks to hours, increased net promotor score by 60%, grown customer base 300%, and became a leader in customer satisfaction

Ideas on selecting … containers

When you need …

- Lower startup latency
- Support for long running compute jobs (> 15 minutes)
- Predictable, high traffic usage
- Persistence of data

When you want …

- Complete control of compute environment
  - But not just for the sake of control

AWS container services landscape

APPLICATION NETWORKING

Service discovery and service mesh

AWS Cloud Map

AWS App Mesh

MANAGEMENT

Deployment, scheduling, scaling, and management of containerized applications

Amazon Elastic Container Service (Amazon ECS)

Amazon Elastic Kubernetes Service (Amazon EKS)

HOSTING

Where the containers run

Amazon Elastic Compute Cloud (Amazon EC2)

AWS Fargate

IMAGE REGISTRY

Container image repository

Amazon Elastic Container Registry (Amazon ECR)

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No boundaries: Run containers where you like

Customers have workloads, workflows, and application portfolios that span AWS, on-premises, and other clouds

AWS is pushing the boundaries with AWS Outposts, AWS Wavelength, AWS Local Zones, and now on-premises, edge, and hybrid capabilities

EKS Anywhere

ECS Anywhere

Choosing your container environment

Amazon ECS

Powerful simplicity

- For Docker-based workloads on AWS
- 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 EKS and ECS

Many customers run a mix of all three!

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Ideas on selecting … serverless

When you need …

- To trigger action on an event
- Support for varying utilization
- Ability to handle unknown demand

When you want to …

- Quickly prove business value
- Hand operational complexity (for example, patching, scaling) to AWS
- Make fewer decisions

AWS Lambda – Event Driven Compute

AWS Lambda

Event-driven
serverless compute

Event

A signal that
status has changed

Event-driven architectures drive reliability and scalability

Event routers

Abstract producers and consumers from each other

Asynchronous events

Improve responsiveness and reduce dependencies

Event stores

Buffer messages until services are available to process

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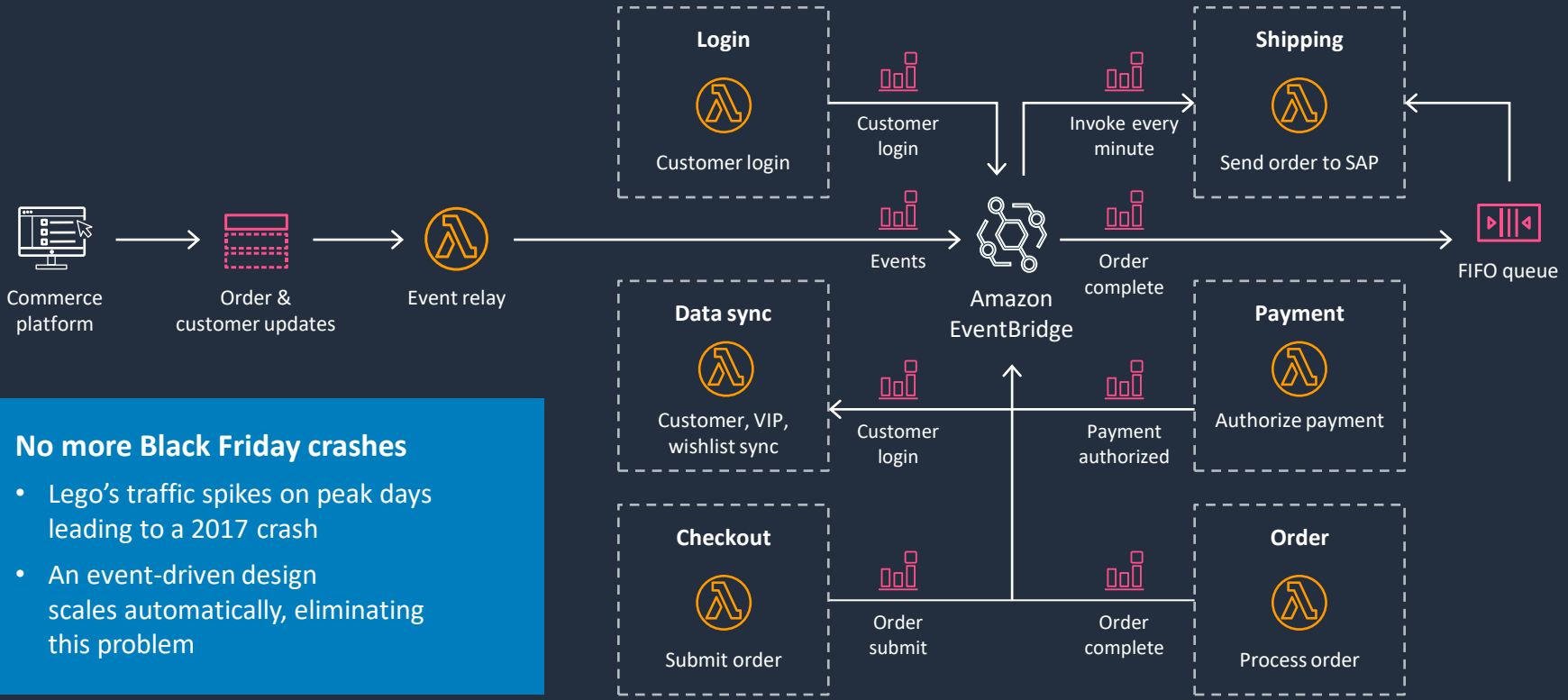
Lego uses an event-driven design for scalability



No more Black Friday crashes

- Lego's traffic spikes on peak days leading to a 2017 crash
- An event-driven design scales automatically, eliminating this problem

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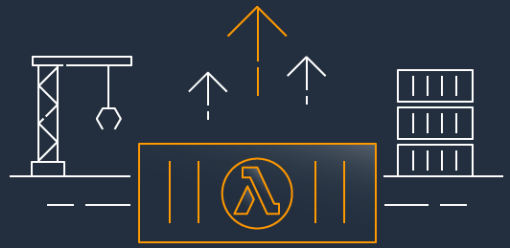
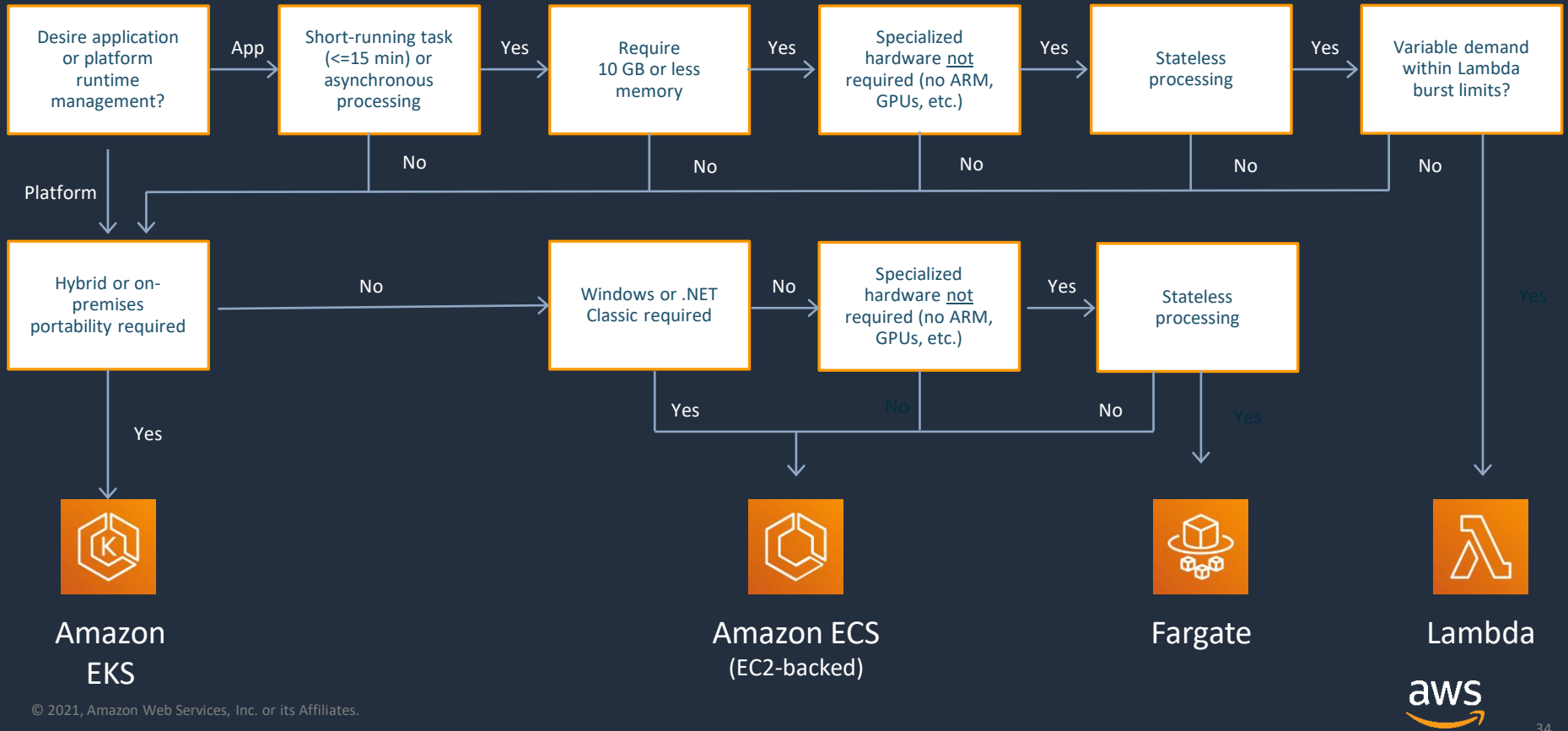
Packaging functions as container images

- Use a consistent set of tools for containers and Lambda-based applications
- Deploy large applications with AWS-provided or third-party images of up to 10GB
- Benefit from sub-second automatic scaling, high availability, 140 native service integrations, and pay-for-use billing model



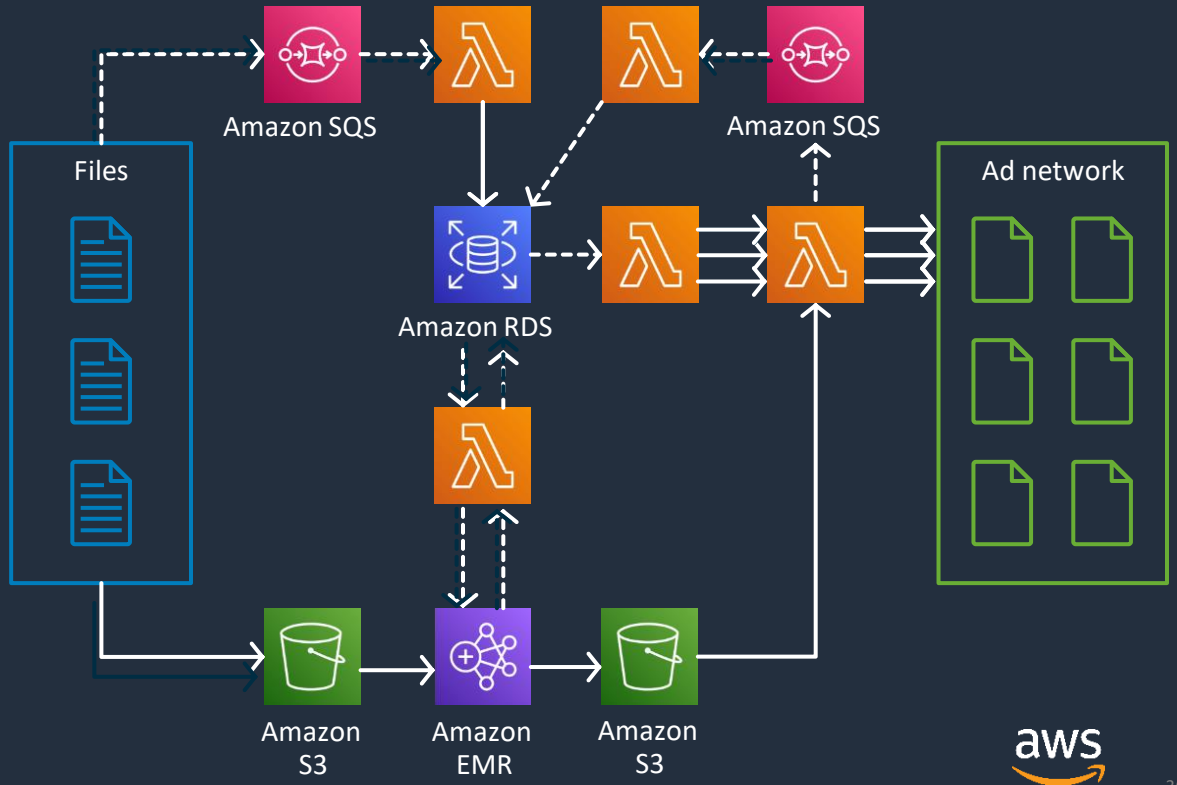
Decision tree



More Customer Examples

Nielsen Marketing Cloud – high scale, low operations

- Processes up to **55 TB of data per day**
- 250 billion events per day
- Up to 3,000 concurrent Lambda functions
- Consistent performance at any scale



nielsen

aws

Success stories

"Amazon EKS has simplified how we operate Kubernetes for our production, development, and research workloads. Since migrating from kops to Amazon EKS, we've significantly reduced the time it takes to upgrade the Kubernetes control plane, from weeks to hours."

Harvey Johal – Head of DevOps, Quora

"What struck us about Amazon ECS was the ease of migration. We did all the migration work from Docker Cloud to Amazon ECS in just 10 days. We did everything internally. It couldn't have gone better.

Charlie Revett, CTO, Vidsy

Success stories

FINRA

Re-architected an Order Audit Trail System (OATs), on-premises Hadoop cluster to AWS serverless in 3 months; increased cost efficiency by 2x while handling half a trillion stock trade validations a day, improving security and compliance

Re-factored an integrated communication system for vending machines. Reduced cost by 65% and reduced maintenance requirements

Resources

Workshop

https://catalog.us-east-1.prod.workshops.aws/v2/workshops/43ffee77-5d1a-4a46-a42a-2e76ea7c1dab/en-US

Containers

https://aws.amazon.com/containers/

Serverless

https://aws.amazon.com/serverless/

Q & A

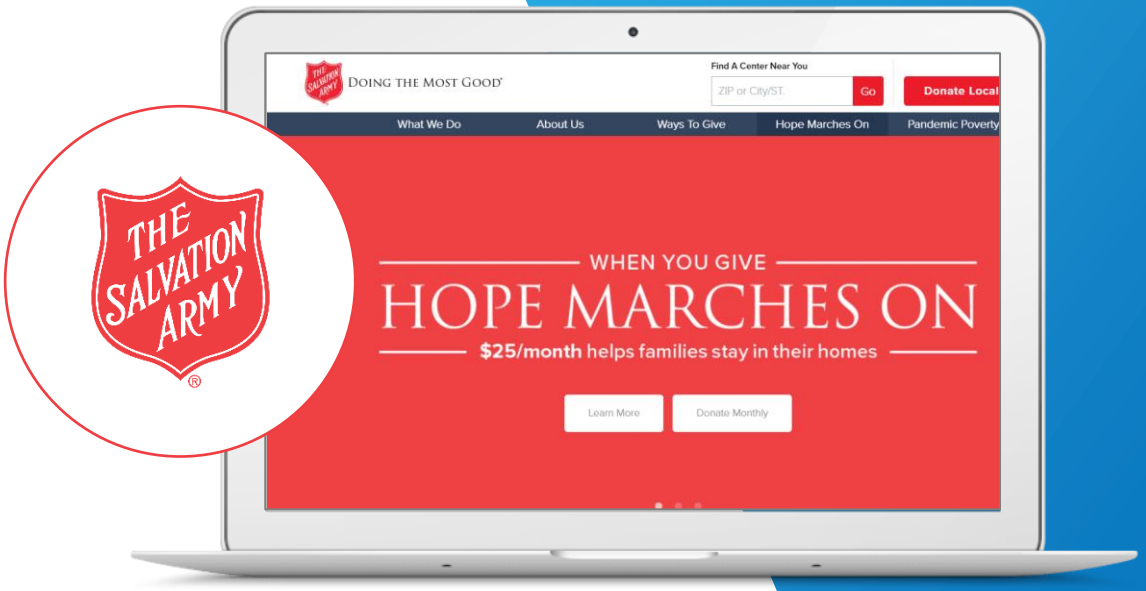
Thank you!

The Client: Salvation Army

Solutions: Serverless, Application Development, Mobile & Web, Data and Analytics

Mobile App for Collecting Donations

- ✓ **Challenge:** The Salvation Army wanted to accept new forms of payment but didn't have the expertise to build a mobile donation app and website
- ✓ **Solution:** ClearScale developed and deployed a new collections app that integrated Braintree with various AWS services
- ✓ **Results:** The Salvation Army can now collect and analyze cashless payments from millions of donors all over the world

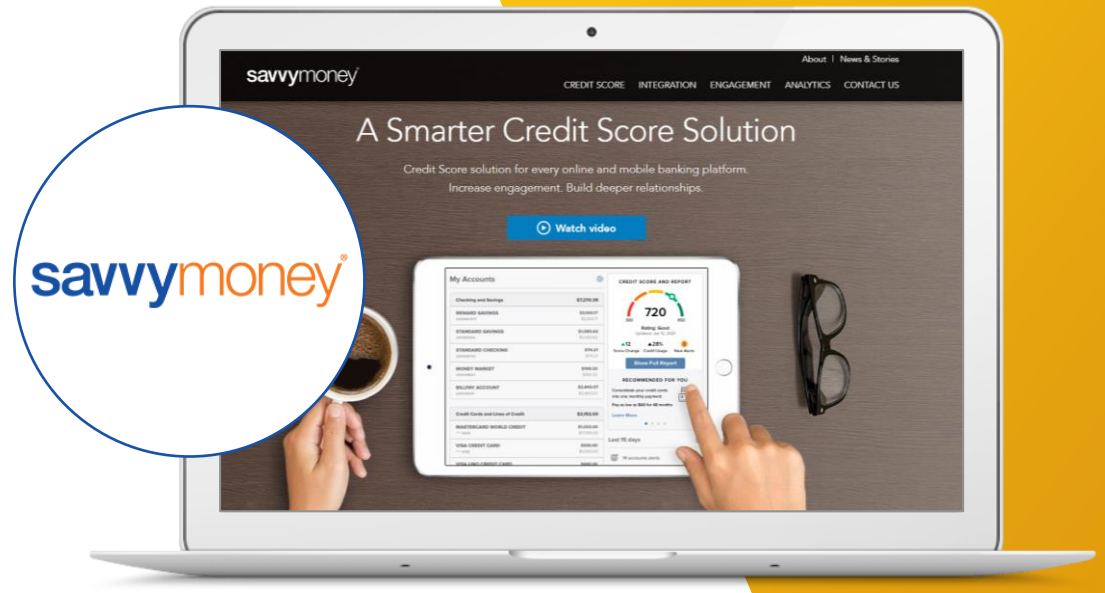


The Client: SavvyMoney

Solutions: Containers, DevOps, Security

Platform Optimization with AWS

- ✓ **Challenge:** SavvyMoney's legacy SaaS infrastructure was struggling to scale with demand and accommodate shifting consumer preferences
- ✓ **Solution:** ClearScale rearchitected the multi-tenant SaaS platform, modernized the UI interface, and implemented a continuous delivery pipeline through Docker container deployments
- ✓ **Results:** SavvyMoney's new SaaS platform simplifies onboarding for new tenants, enables seamless integration with different online banking platforms, and supports shorter release cycles and deployments



ClearScale Migration (MAP) Offerings

Migration Readiness Assessment (MRA)	Migration Readiness Planning (MRP)	Migration at Scale	Database Freedom
Identify migration challenges	Migrate business case	Execute large-scale migration	Migrate between different engines
Identify capability gaps	Establish cloud foundation	Optimize processes	Automate schema conversion
Evaluate migration readiness	Landing Zone	Optimize applications	Eliminate database licensing needs
	Pilot Migration (1-2 Applications)		Re-factor and stabilize code

**Complete offering details available in the Handouts section*

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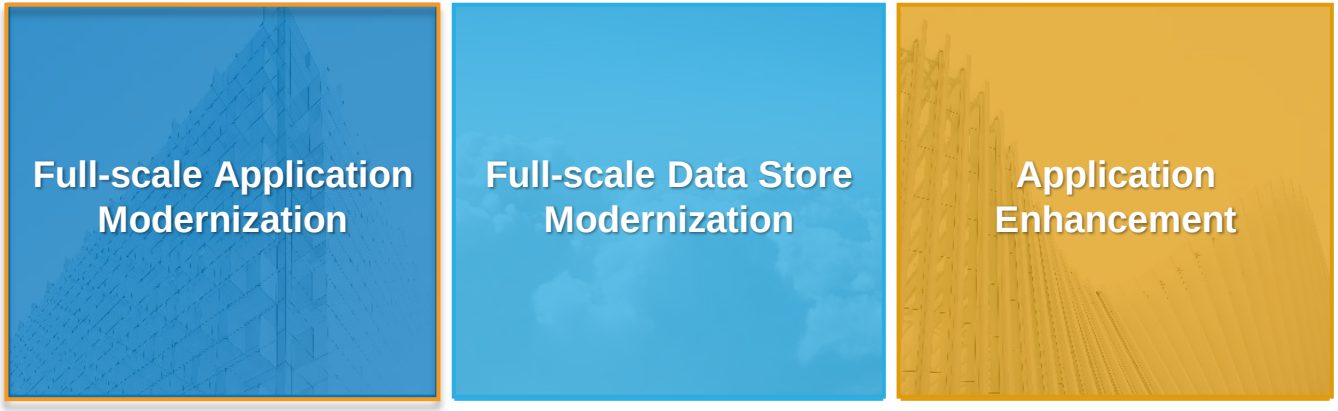
ClearScale Application Modernization Offerings



Review existing application	Audit current cloud data stores	Identify app with AI / ML potential
Create roadmap for optimal state	Map future data stores	Quantify potential value
Execute application modernization	Execute data store modernization	Execute integration
Deploy modernized application		

**Complete offering details available in the Handouts section*

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MODULE 1 & 2:
Monolith and API Gateway

BREAK

Adopting the Startup Mindset

Startups: Planet of the Apps

258B

+45% by 2022

App downloads forecast: continued growth

Source: AppAnnie

80%+

Companies expect to invest in native and web apps

Source: AWS

71.5%

JavaScript popularity increasing

Source: Stack Overflow

4X

GraphQL popularity increasing

Source: 2018.stateofjs.com

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The development lifecycle

1

IDEA

-

Define Business Requirements

2

APPROACH

-

Develop Native and/or Web

3

CX

-

Design & Data Modeling

4

DEVOPS

-

Development Workflows & Delivery

5

ITERATION

-

Customer Feedback Response

‘A need for speed’

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Developer requirements

Innovation & Differentiation

Speed to Market

Highly Performant/Secure/Global

Increasing developer agility

Fast

- Focus on innovation
- Front & Back work together
- Built-in DevOps
- Purpose-built for Front End

Fully Managed

- Managed backends
- No ‘one-way’ doors
- Serverless, if you choose

Why are customers choosing to build modern apps?

Faster to market

Increased rate of innovation

Reduced costs

More reliable applications

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We are witnessing a paradigm shift

Our goal is to automate and abstract away as much as is possible so customers can focus on building applications for their business

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MODULE 3 & 4:
Microservices and Containerization


SURVEY

QUESTIONS

Workshop Presentation Team

Available to assist and support in *chat*










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