
AWS
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CON291-L

Modernizing with containers

Deepak Singh
VP, Compute Services
AWS

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“There is no magic, there is only awesome.”

Jamis Buck



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Agenda: Modernizing with containers

Patterns for modernization

Core technology to help you build

Adoption at scale

Usability: Putting it all together



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Vanguard's modernization journey

CHOOSING CONTAINERS ON AWS FOR THEIR TRANSFORMATION TO THE CLOUD



Challenge and solution

With 2,500 applications, 20 PB of data, 5,000 technical staff, and "no downtime" tolerated, Vanguard started their transformation to the cloud six years ago. To stay competitive in the digital age, they need to accelerate their pace of innovation, delivering business value at startup speed. Exploring DevOps, microservices, and CI/CD, they selected AWS and created the "cloud construction" team.

"We chose ECS / Fargate for a variety of reasons: it's a fully distributed architecture, it enables DevSecOps patterns, was backwards compatible with our legacy container orchestration platform, is fully automated and automatable, secure by default, is cost-effective, and enables NoOps patterns."

Yoni Ryabinski

Chief Enterprise Architect, Vanguard

Patterns for modernization



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The only constant is change

Customers today face unprecedented business challenges

BUT they also have incredible opportunities to reinvent themselves

Adopting the principles of modern application development helps organizations survive and even thrive



Common questions we hear from customers

- How can I move my workloads to the cloud?
- How can I modernize my applications?
- How do I give my developers a self-service platform?
- How do we get consistent tooling and governance?
- Should I pick containers or serverless?
- How can I meet changing demands?

Why modernize? Any app at any scale

BUSINESS BENEFITS		MODERN APP CHARACTERISTICS
Improve customer experience		Scales to millions of users
Increase the efficiency of developers		Global availability
Increase business agility		Responds in milliseconds
Improve ROI and reduce TCO		Handles petabytes of data

Strategies for modern applications

1. Replatform

Containerize applications

Migrate to the cloud

2. Refactor

Rearchitect for cloud capabilities

Optimize for cost efficiency

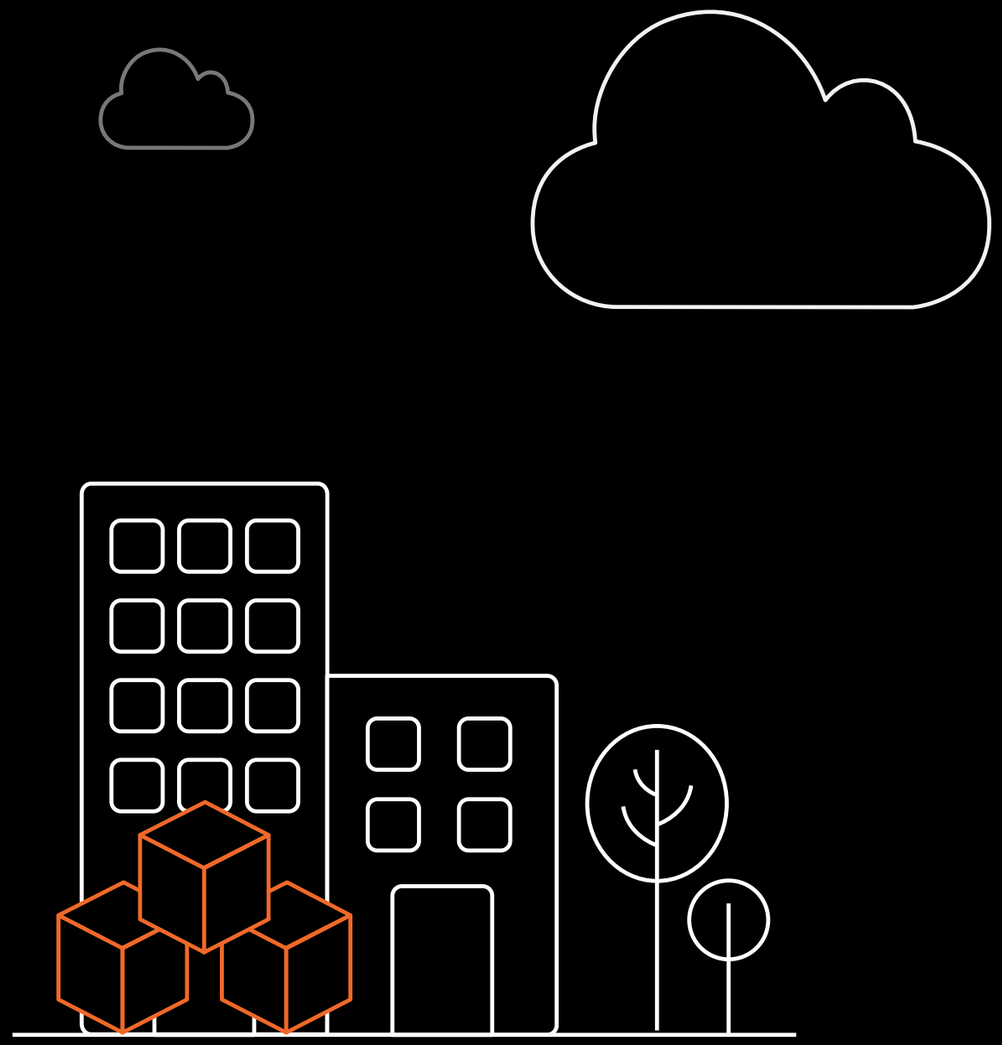
3. Build new applications

Build a shared services platform

Optimize for speed of development

Strategy 1: Replatform

MIGRATING ENTERPRISE WORKLOADS



Customer benefits

- Lower direct costs
- Reduce operational overhead
- Increase resource utilization rates
- Increase security
- Increase flexibility

Replatforming: Fidelity

MIGRATING ENTERPRISE WORKLOADS



Challenge and solution

Speed to market was a top priority at this diversified financial services firm, which serves millions of customers daily. Fidelity built several tools and services with Amazon EKS and migrated their enterprise applications to the cloud.

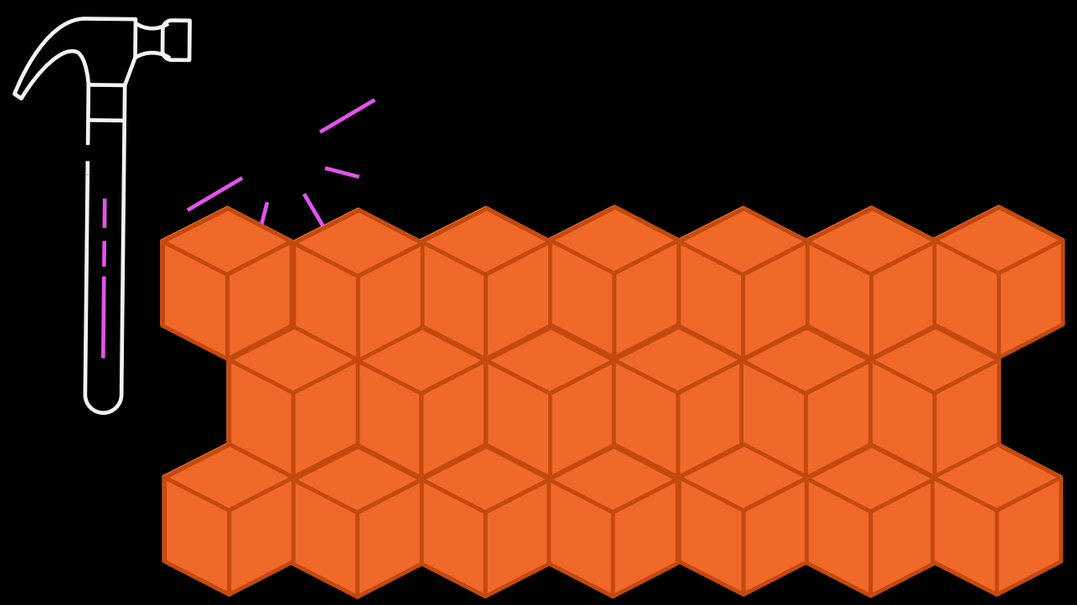
“We are very excited to use EKS as one of our strategic platforms to address complex modern enterprise requirements such as security, resiliency, operational excellence, and the development of cost-effective solutions in the highly regulated financial services industry.”

Amr Abdelhalem

Head of Cloud Architecture,
Fidelity Investments

Strategy 2: Refactor

RE-ARCHITECT FOR CLOUD CAPABILITIES



Customer benefits

- Lower risk that the whole application breaks
- Best-in-class AWS security, without the need for configuration
- Reduce total costs with serverless
- Decouple the organization to innovate faster

Refactoring: National Bank of Australia (NAB)

RE-ARCHITECT FOR CLOUD CAPABILITIES



Challenge and solution

NAB needed to expand existing capabilities to grow, modernize, and meet changing customer demands. They realized that a digital and technical transformation would help them to be faster, more agile, relevant, and resilient in servicing their customers' needs. NAB started to accelerate their cloud journey, breaking down monolithic applications into modern architectures and reducing microservices development time.

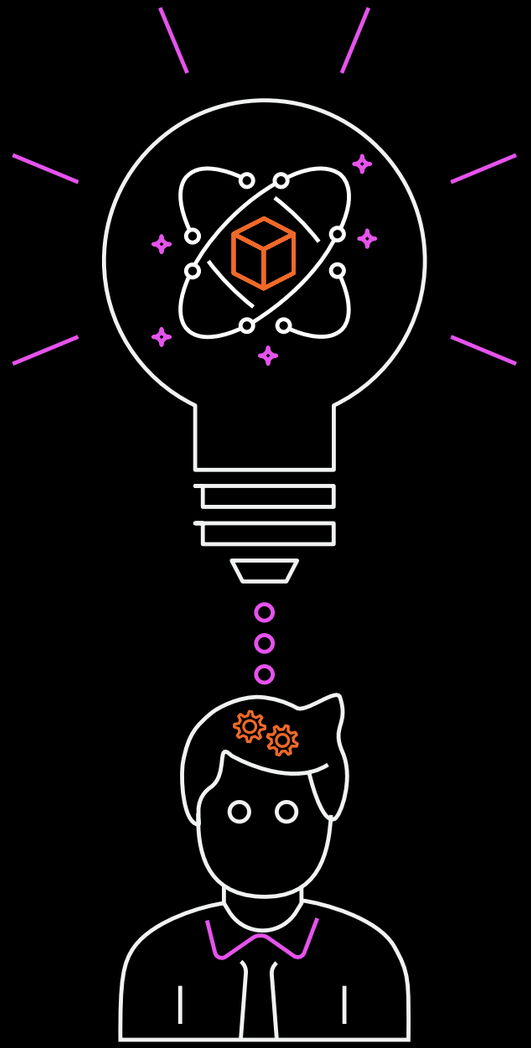
"ECS has already reduced NAB's microservice development time by a factor of 10."

Steve Day

EGM of Infrastructure, Cloud, and Workplace, NAB

Strategy 3: Build new applications

FOCUS ON DEVELOPING WITH A SHARED SERVICES PLATFORM



Customer benefits

- Reduce time to market with rapid iteration and experimentation
- Increase productivity and agility
- Focus on logic and not infrastructure

Building new applications: Snap Inc.

FOCUS ON DEVELOPING WITH A SHARED SERVICES PLATFORM

Snap Inc.

Challenge and solution

Snap Inc. needs to manage a large set of services and reduce the time for launching new microservices. They use Amazon EKS and Amazon ECR for running their services and move from a monolithic platform, breaking it into SOA.

“EKS is helping us to run over 2 million transactions per second. Through EKS and ECR, Snap has realized a 77% reduction in developer effort for launching new microservices.”

Karl D'Adamo

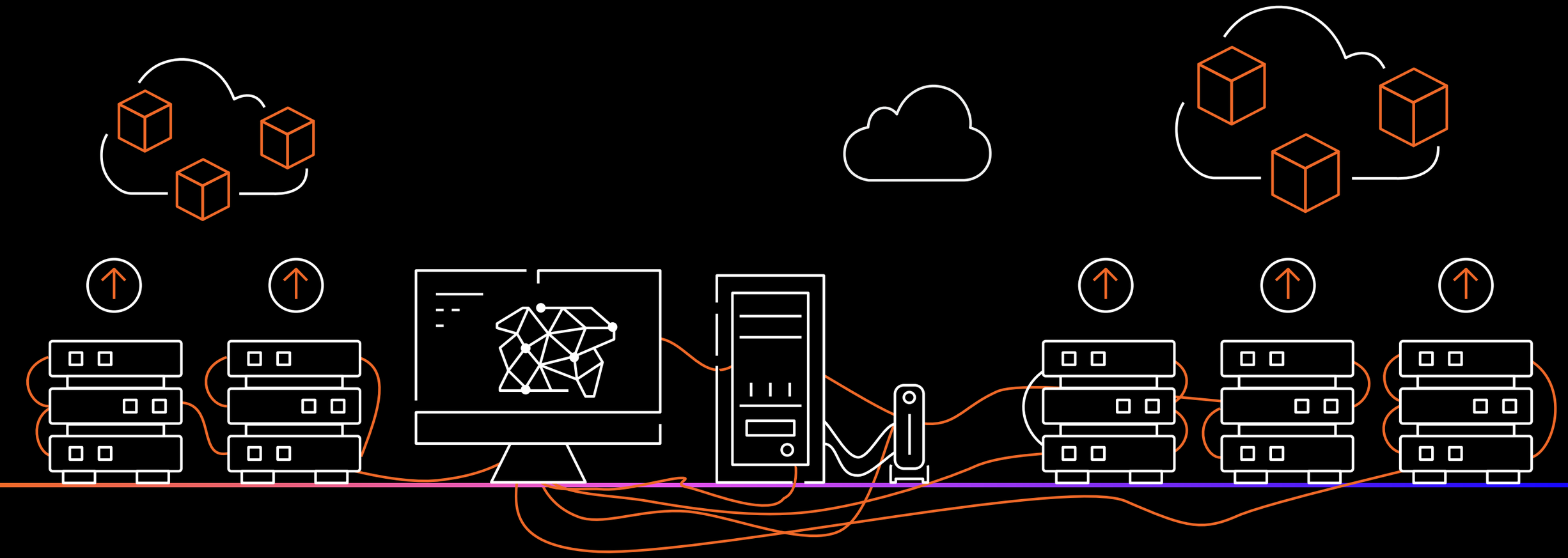
Senior Director of Engineering,
Snap Inc.

Core technology to help you build



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Abstract away the infrastructure pain

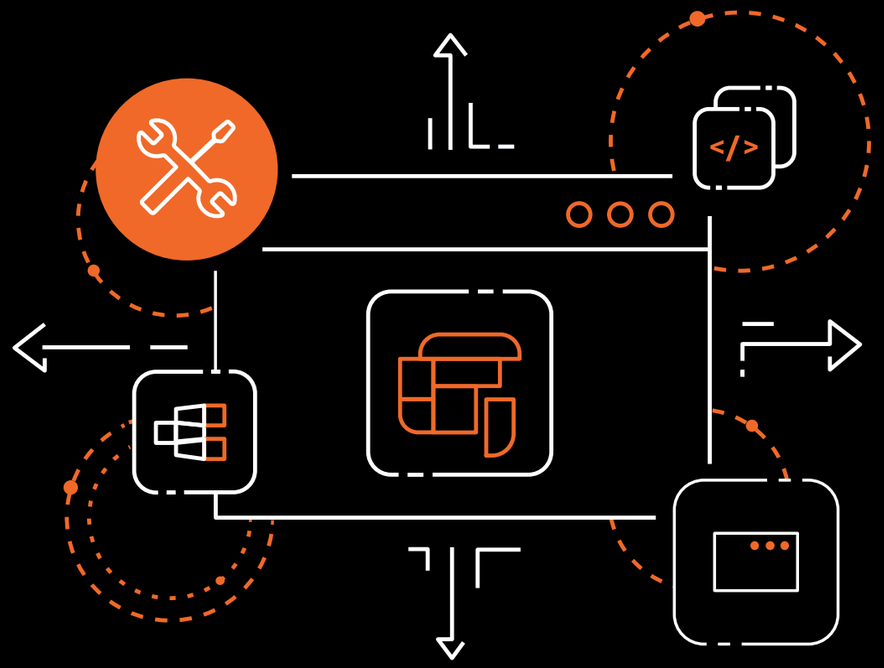


Managing infrastructure environments is hard and not always a value-add activity

Containers (and cloud) help abstract from the hardware and OS complexity

You need a complete / integrated portfolio of services to cover all needs

Modernize with containers



- Provide a standard way to package your application's code, configurations, and dependencies into a single object
- Share an operating system installed on the server and run as resource-isolated processes, ensuring quick, reliable, and consistent deployments, regardless of environment

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)

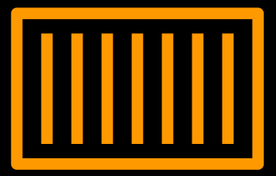
How to get started with existing apps

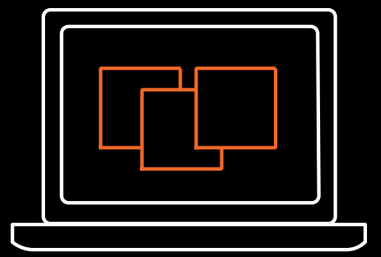
PROBLEM

How to easily migrate existing apps

- AWS App2Container makes getting started with containers easy
- NEW: Collaborating to offer a native Red Hat OpenShift Service on AWS





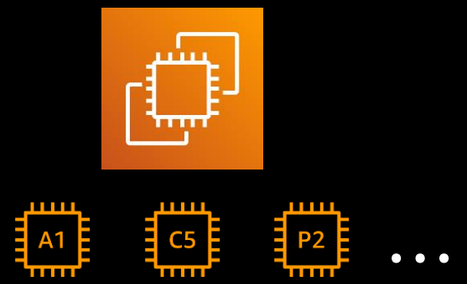


Compute infrastructure & architecture choices

PROBLEM

Many decisions to make on how you want to provide compute

Compute: Amazon EC2, Spot, Graviton



Serverless: AWS Fargate



Serverless compute: Samsung

IMPROVING OPERATIONAL EFFICIENCY WITH FARGATE



Challenge and solution

Samsung typically had administrators and operators dedicated to managing their web services for the Samsung developer portal. As they migrated to Fargate, they were able to easily eliminate the need for an administrator, saving costs while improving development efficiency.

“Our engineering team began migrating all of our systems to Fargate. Because Fargate exposed the same APIs and endpoints that ECS did, the migration experience was extremely smooth, and we immediately experienced improvements in operational efficiency. Now, our operations and administration teams are focused more on elaborate logging and monitoring activities, further improving overall service reliability, security, and performance.”

Tylor Kim

Staff Engineer, Cloud Operation Group,
Samsung Electronics Co., LTD

Technical Deep dive on the case:

Deep dive in Samsung Secure Developer Portal AWS Architecture Blog »

Other infrastructure and architecture choices

PROBLEM

Many decisions to make on how you want to manage resources

Storage: Amazon EFS, Amazon EBS, Amazon FSx



Serverless functions: AWS Lambda



Security and monitoring: IAM, Amazon CloudWatch



Mesh networking: AWS App Mesh



NEW: mTLS

Choosing container orchestrators

PROBLEM

What is the best fit for how I want to operate containers?

Orchestrators:

Amazon ECS — powerful simplicity

Amazon EKS — open flexibility

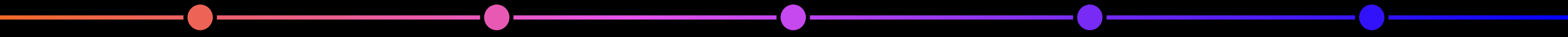




No boundaries: Run AWS services where you like

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



Customer infrastructure

AWS Outposts

AWS Wavelength

AWS Local Zones

AWS Regions

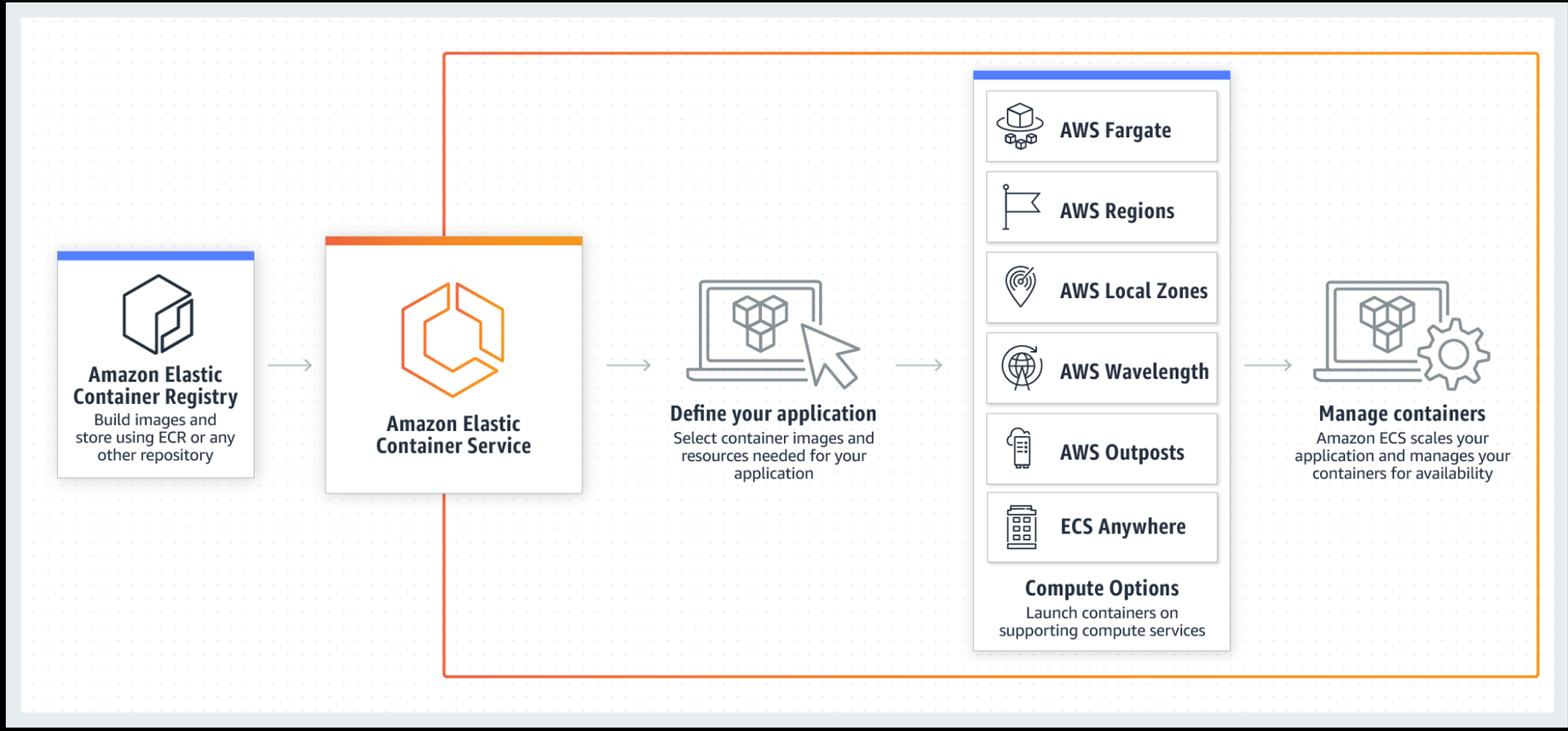
New: Amazon ECS Anywhere

PROBLEM

How to use Amazon ECS for application portfolios that span AWS, on-premises, and other customer managed infrastructure

Fully managed and highly scalable

Powerful simplicity for your hybrid footprint

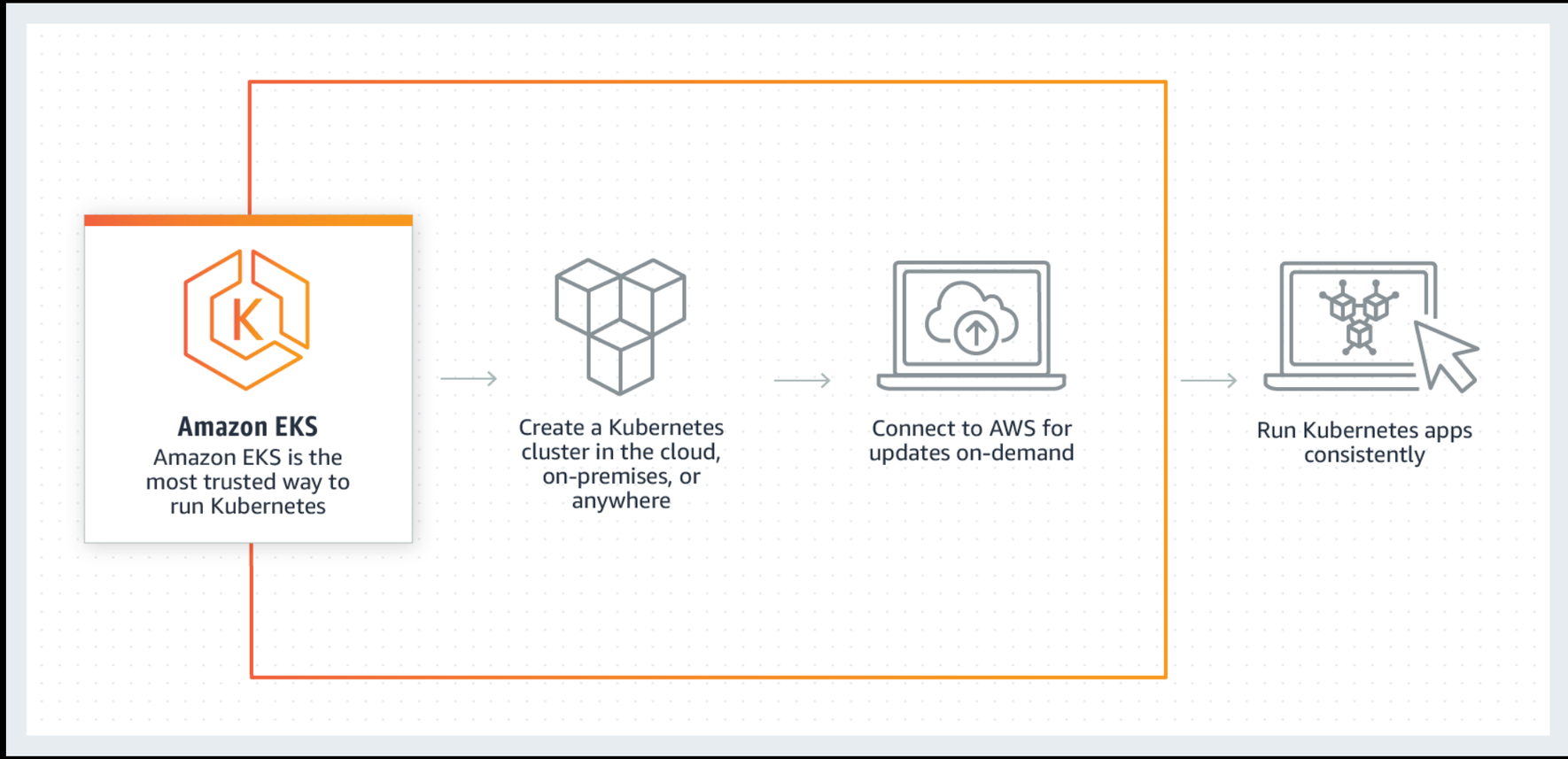


New: Amazon EKS Distro

PROBLEM

How to run Amazon EKS outside of AWS Regions. Customers have workloads, workflows, and application portfolios that span AWS, on-premises, and other clouds.

Amazon EKS Distro is the same one run on the AWS Cloud

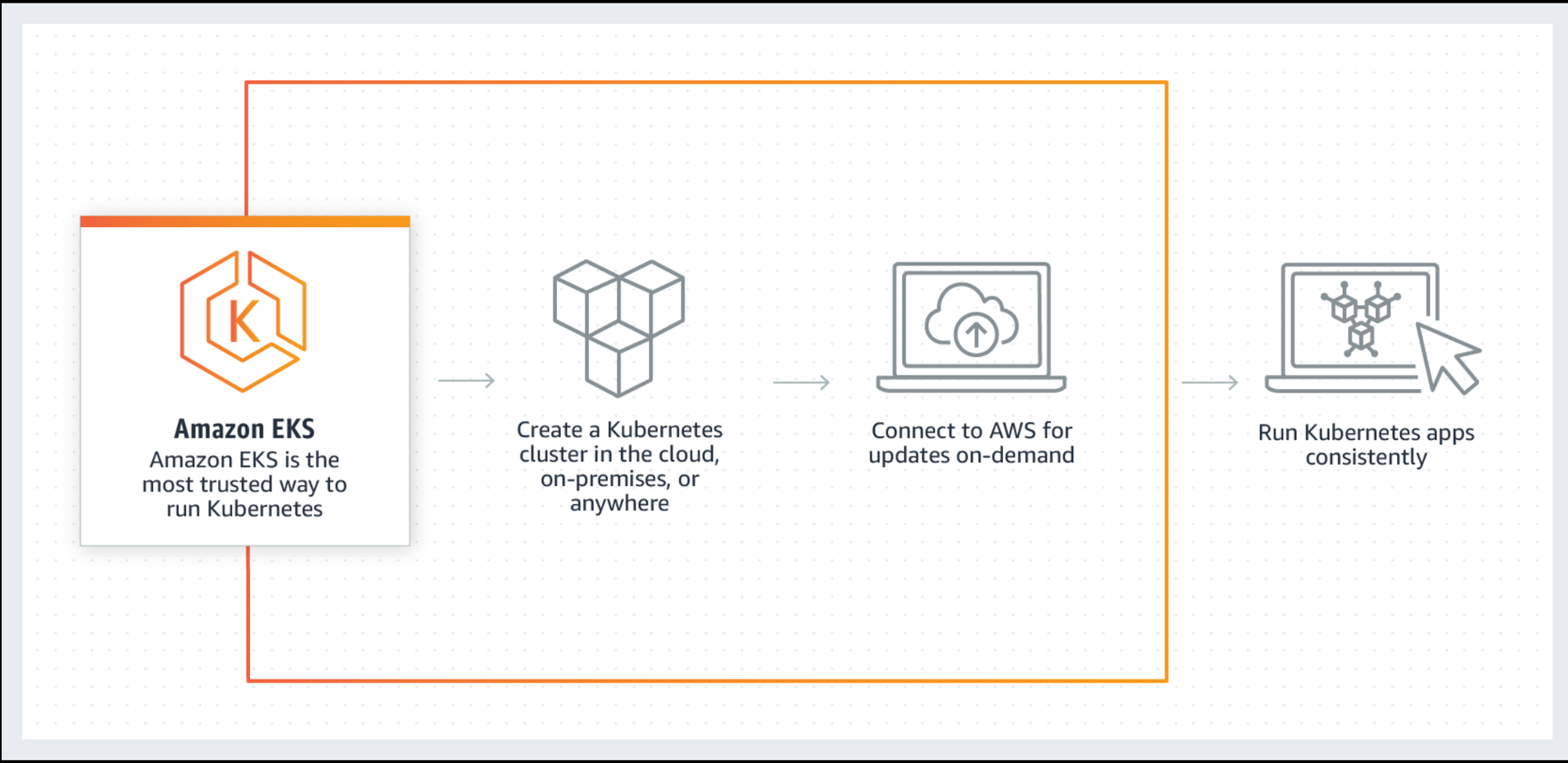


New: Amazon EKS Anywhere

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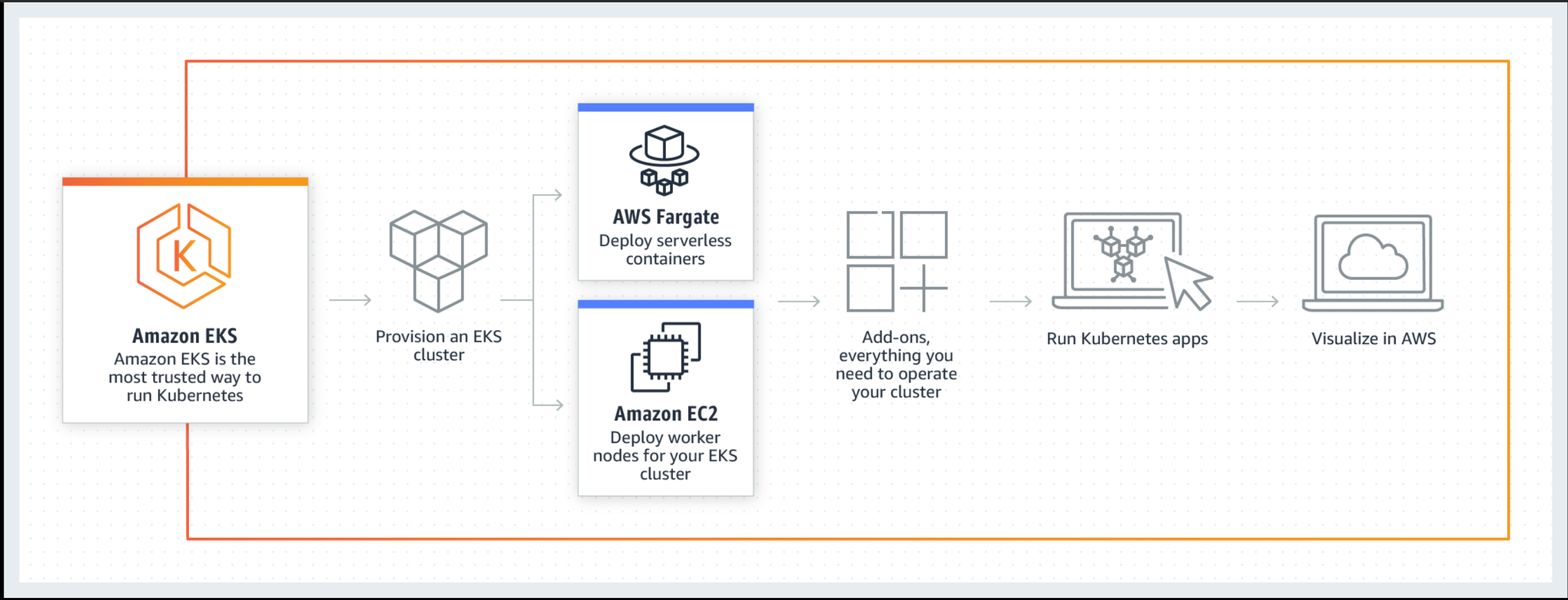
Manage K8s clusters on premises



New: Amazon EKS Add-ons and Dashboard

PROBLEMS

Limited observability to containers in different places. Complexity in managing and patching Kubernetes components.



Run your apps with consistent controls – everywhere

OUR VISION

A consistent operator and developer experience to manage, monitor, and govern all aspects of your applications and infrastructure anywhere

"By using AWS, we've cut the time needed to build new application infrastructure by more than 99%.

With the virtually instantaneous infrastructure available on AWS, our DevOps teams have the building blocks they need to start developing any new product as soon as they understand the intent behind it."

Mark Donovan,

Divisional Chief Architect & Vice President,
Capital One



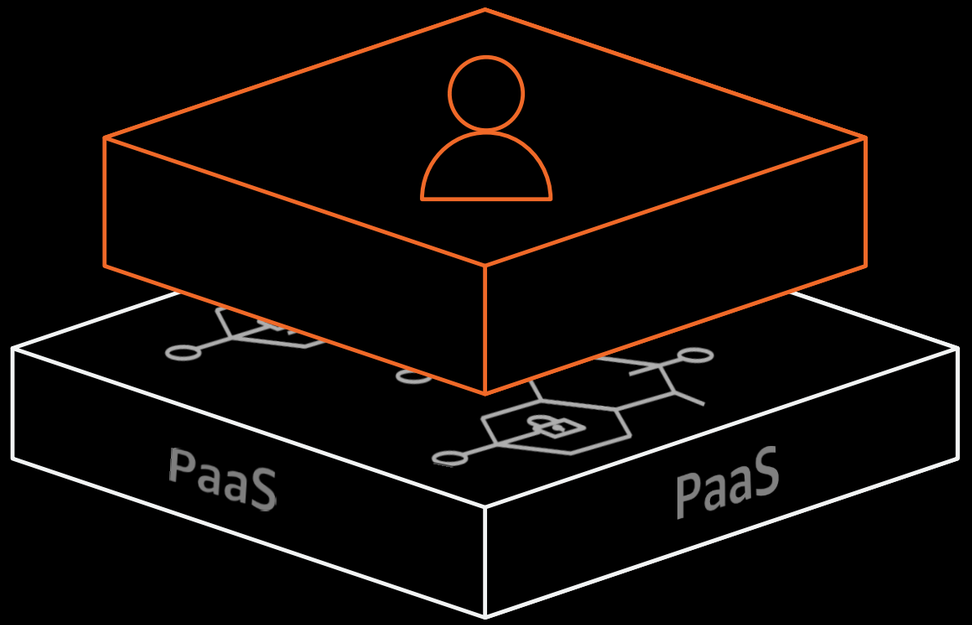
Adoption at scale



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Abstract away the operator pain



- Creating a development platform is hard
- Need to stand up a consistent stack to improve everyone's productivity
- Also to provide better guardrails for protection

Build a shared services platform (SSP)

A shared services platform is a customized self-service interface, streamlined for deploying code

Developers are more productive

Operators can define standards on security, software delivery, monitoring, and networking

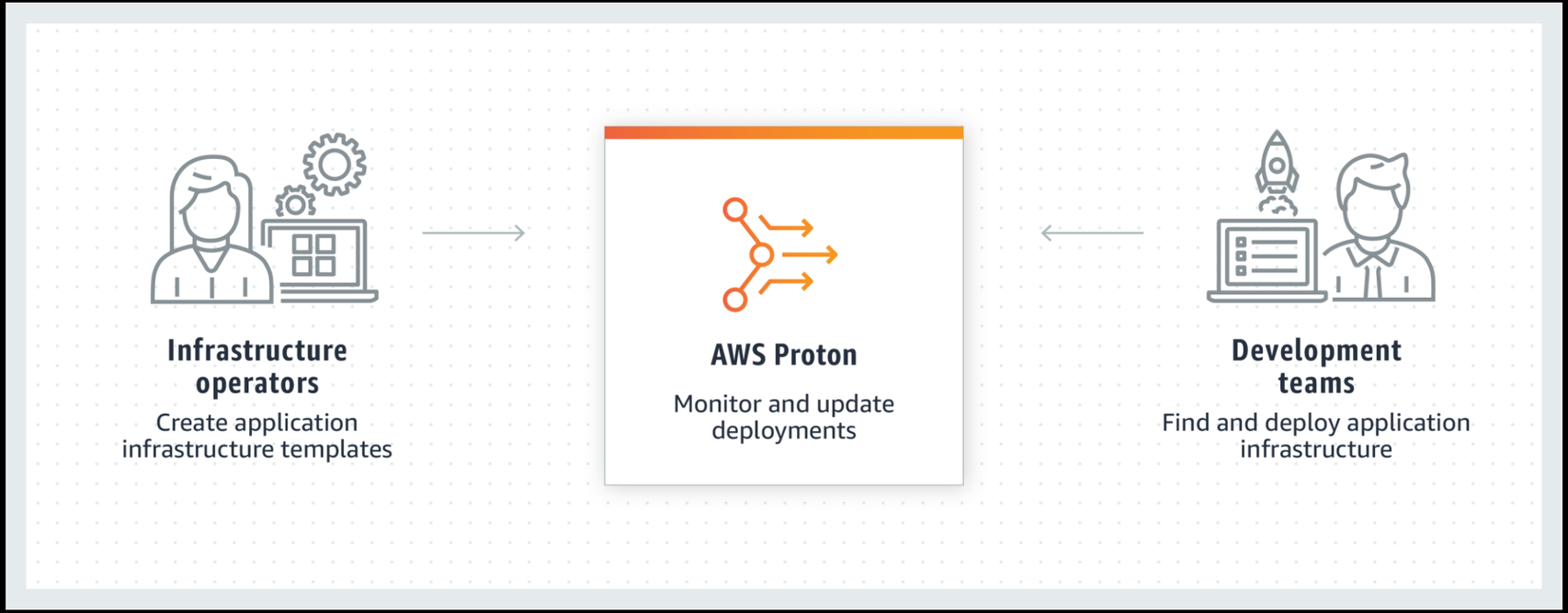
Operators have more control

New: Manage deployments with AWS Proton

PROBLEM

Deploy code pipelines with consistent standards and management

The first fully managed deployment service for container and serverless applications



Observability to help meet your SLAs

PROBLEM

Use familiar tools to see what's happening and troubleshoot

Firelens (Fluent Bit logging) on Amazon ECS

NEW for Amazon EKS!

NEW: Making it easier to use
Prometheus, Grafana, OpenTelemetry



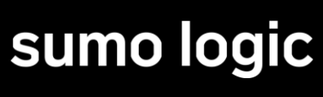


Partners include: Sysdig, Datadog,
New Relic, Sumo Logic







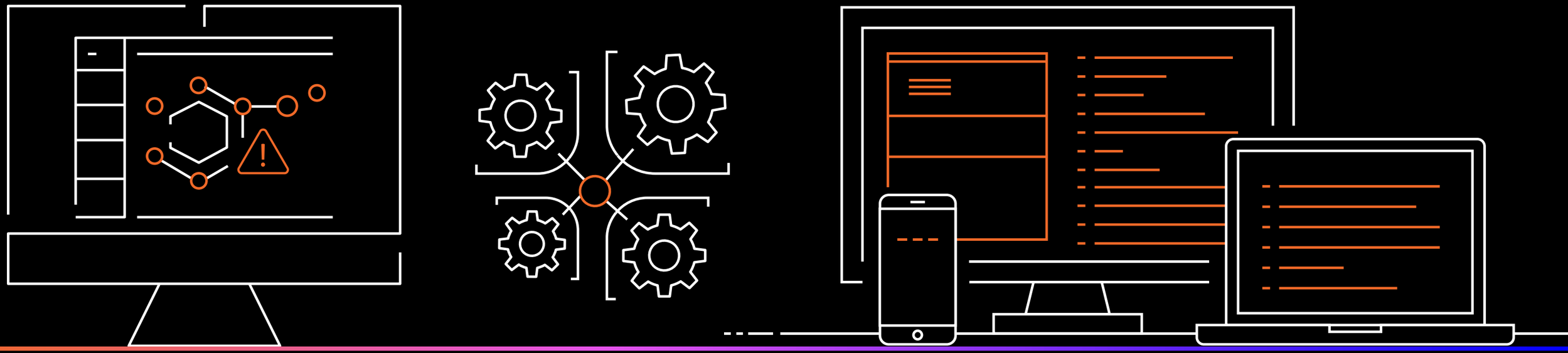


Usability: Putting it all together



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Abstract away the developer pain



Building applications is hard

With the right automation,
it gets a lot easier

You can be more productive
and agile and focus on creation,
not admin work

Sharing container software

PROBLEM

How to innovate and collaborate with images and artifacts

AWS Code Artifact



Amazon ECR for private registry

Billions of image pulls today



NEW: Amazon ECR Public registry and gallery

Modeling an application

PROBLEM

Give developers the best tools to define and model their applications and deploy their code. Ship features faster and keep up with business needs.

AWS CDK

AWS Serverless Application Model (AWS SAM)



AWS Amplify

Build and deploy new applications

PROBLEM

How to make developers productive

Copilot

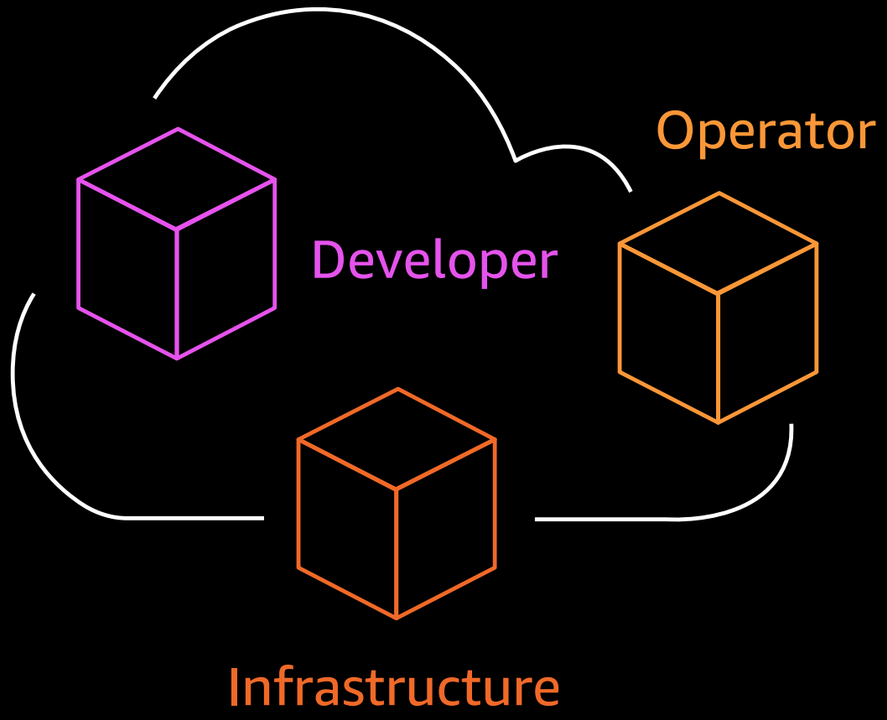
```
copilot$ ./copilot
Launch and manage applications on Amazon ECS and AWS Fargate.
```

Docker Compose integration



docker compose

Vision for the future



- Containers and cloud abstracted to reduce complexity
  → But that complexity has returned!
- Meet customers where they need to run, but help them move to cloud
- Offer new ways to simplify – get where you want and compress the time to get there

Some suggested sessions on containers

CON219	Containers at AWS: More options and power than ever before
CON209	Getting up and running with Amazon EKS
CON206	Getting up and running with Amazon ECS
CON203	Choosing your container data plane on AWS
CON208	GitOps compliant: How CommBank multiplied Amazon EKS clusters
CON214	Fidelity Investments: Two years and 10,000 containers later
CON204	Snap Inc.: Leveraging the benefits of AWS Graviton on Amazon EKS
CON215	Samsung Smart TV: Globally scaling with AWS Fargate Spot

… plus dozens more!


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