

The background of the image features a dark blue gradient on the left, transitioning into a large, vibrant, abstract shape on the right. This shape is composed of overlapping curved segments in shades of orange, pink, and purple, creating a dynamic, modern aesthetic.

AWS re:Invent

NOV. 27 – DEC. 1, 2023 | LAS VEGAS, NV

CON101-S

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Air Canada's journey with Red Hat OpenShift Service on AWS (ROSA)

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The journey

- About Air Canada
- Culture of innovation @ Air Canada IT
- Past state of enterprise messaging platform (EMP)
- The need for change
- Why choose an application platform?
- Red Hat OpenShift Service on AWS (ROSA)
- Air Canada's ROSA implementation
- Q&A

About Air Canada – Summary

- Based in **Montreal**
- Founded in 1937 – **85 years old**
- **Largest airline** in Canada
- Founding member of **Star Alliance™**
- **51 Canadian airports** (500 daily frequencies)
- **51 US airports** (400 daily flights between countries)
- International network extends to **six continents** with service to over **80 airports**
- **36 million passengers** carried (2022)
- Fleet size of 385 (**0 Canada Geese**)



Our Industry - Why Innovation is Key

- Capital intensive
- Labor intensive
- Highly competitive
- Highly complex systems
- Heavily regulated and scrutinized
- Thin margins
- Very dynamic and sensitive to various uncontrollable factors



Culture of innovation @ Air Canada IT

Safe, secure, and reliable operations

Elevating the customer experience

Operational efficiency

Adopting technologies to enhance
business outcomes



Air Canada IT key programs

- 
- Core Passenger Systems (PSS)
 - Loyalty (Aeroplan)
 - OPS Modernization

Building platforms @ Air Canada

Platform Needs



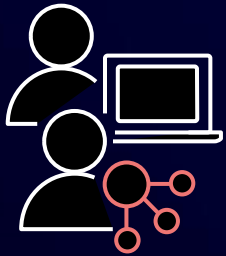
- Reduce cost per compute unit
- Cross-Region failover or DR capabilities
- Support for different-sized workloads
- Support for different workload types
- Low maintenance

Airplane Needs



- Reduce cost per seat mile (CASM)
- System and sensor redundancies
- Efficient for short and long hauls
- Lighter and stronger airframe, more seats, and efficient engines
- More time in air, less time on ground

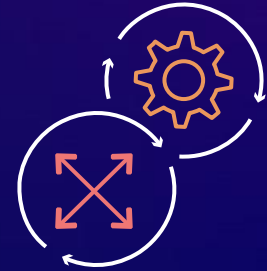
Why we build platforms @ Air Canada



Build Practice Around
the Platform



Define Patterns
and Standards



Consistency
Efficiency
Reusability



Measurable and
Predictable
Performance

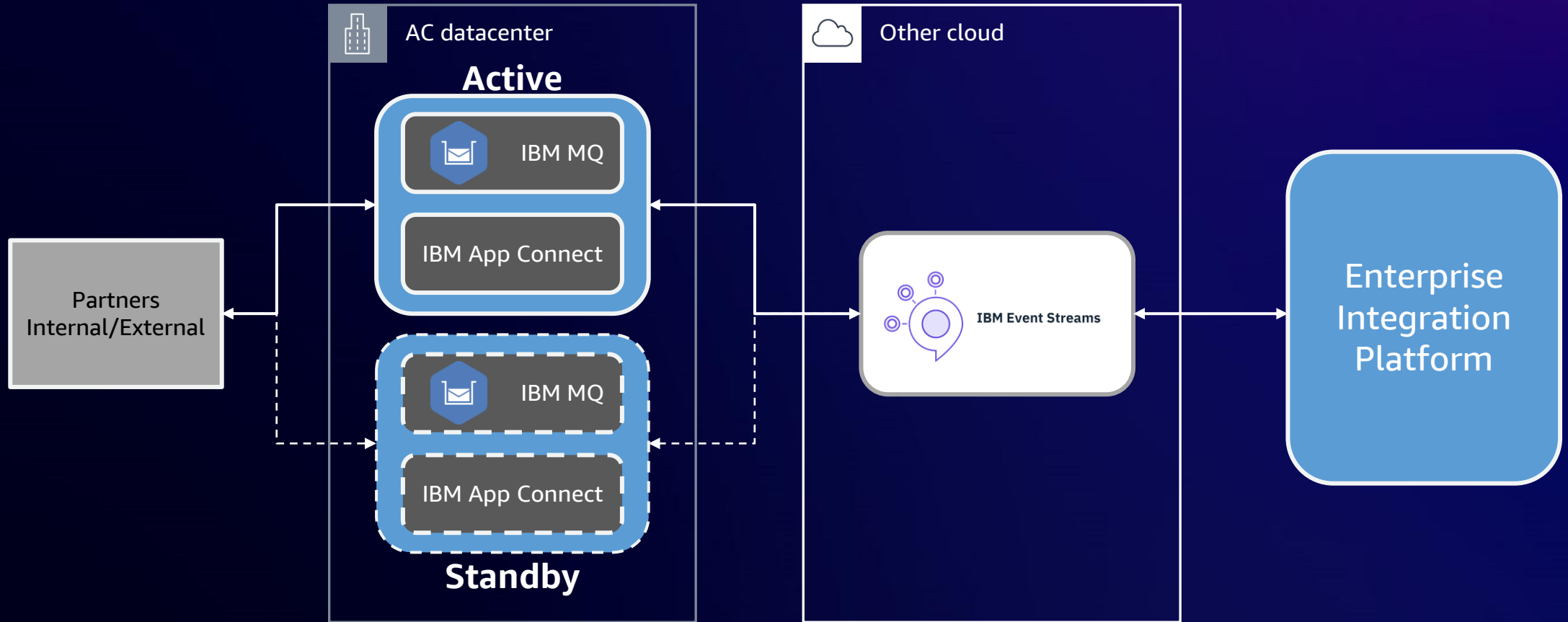


Reliability
and Success

Need for transformation

Past state of enterprise messaging

LEGACY SYSTEMS OVERVIEW




Past state of enterprise messaging

LEGACY SYSTEMS OVERVIEW

- Built on physical mainframe infrastructure, which was **expensive to maintain**
- Distributed Messaging **Hub per business unit**
- **Redundant and expensive** infrastructure for similar use cases
- **Oversized servers** to accommodate peak load
- Licensing cost based on CPU provisioned and was **not cost effective**
- Application **deployment took hours**
- Patching of servers was **complex and risky**

Recognizing the need for change

IT COULD BE BETTER

AREA FOR IMPROVEMENT		PROPOSED CHANGE
Reduce costs		Retire mainframe message application
New capabilities		Modernize to Kafka/ROSA
Increase platform scalability		On-demand auto scaling
Focus on business outcomes		Reduce technical debt

High-level Architectural Decisions for Enterprise Messaging Platform

- AWS-based solution
- IBM MQ and IBM AppConnect
- Containerized and fully managed
- IaC for platform management
- GitOps and CI/CD for application management
- Extensive Kafka support
- IBM CloudPak for Integration (CP4I)

Key requirements

KEY NONFUNCTIONAL REQUIREMENTS



Availability management

Availability goal of 99.95%

Datacenter separation

“Real Time”
synchronization with DR

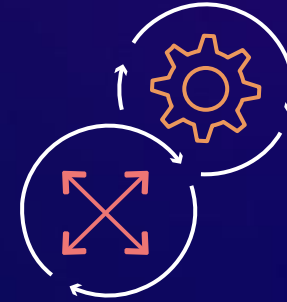


Capacity management

12.5 million messages/day

400 messages/second
peak

50 partner interfaces



Scalability

Allow for growth per partner
interface

Allow for growth in number
of partners

Key requirements

KEY NONFUNCTIONAL REQUIREMENTS



Performance

99.525% of response times
under 2 seconds



Security

Code low - Deploy high
Disconnected
Identity provider integration
SIEM integration



Observability

Dynatrace support
Dynatrace ActiveGate support
Splunk support
Amazon CloudWatch support

Why choose an app platform?

The need for an application platform



Customers

Innovation in IT
happens at the
customer level



Reduce overhead

Focus on applications
not the platform

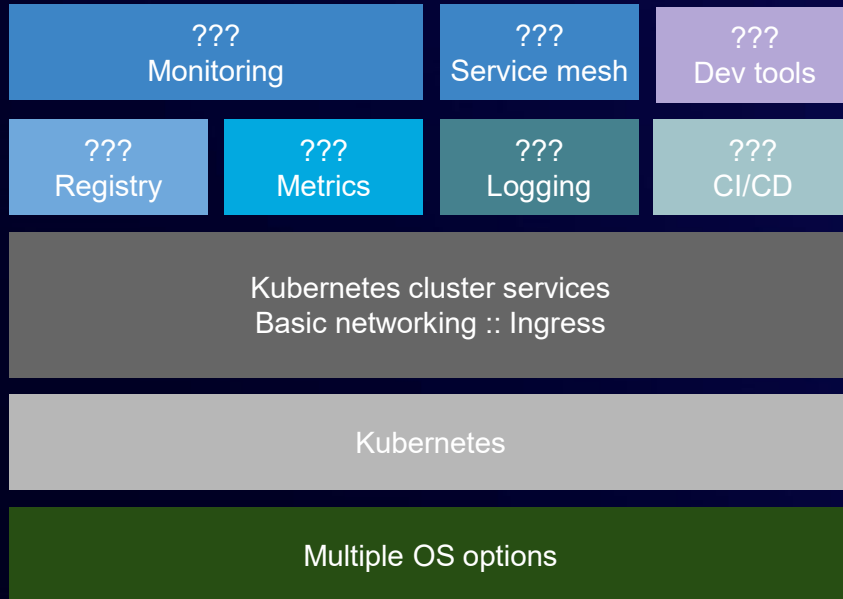


Built-in capabilities

Leverage pre-existing
platform capabilities
such as availability,
scalability, and security

App platform problem

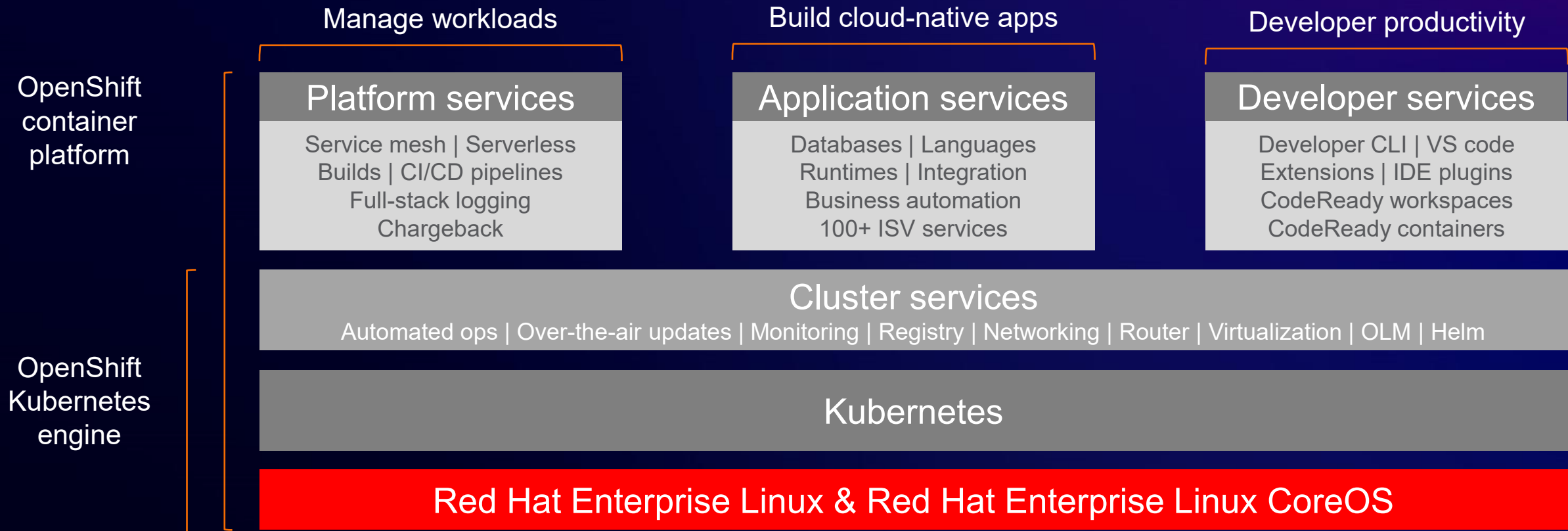
A LOOK AT DIY KUBERNETES



- Full assembly required
- Unmanaged
- No defaults
- No integrations

Insert Red Hat OpenShift

COMPLETE APPLICATION PLATFORM



Physical



Virtual



Public cloud



Managed cloud



Edge

ROSA: Red Hat OpenShift Service on AWS



AWS and Red Hat collaboration helps customers meet digital needs

Red Hat and AWS are **industry leaders** with extensive experience in IT infrastructure, hybrid cloud, digital transformation, and open source innovation

Through collaborative engineering activities, they offer **integrated, certified solutions** to meet modern, digital business needs

Consistent, enterprise-grade platforms with advanced security and management features help organizations build IT infrastructure that **supports their business efficiently and cost-effectively** and adapts on their schedule

Red Hat and AWS by the numbers

Partners since
2008

>60,000
of AWS customers
consume Red Hat
products and solutions

“Given that Red Hat is the world’s leading provider of open-source solutions, our enterprise customers have been passionate about seamlessly running Red Hat Enterprise Linux and various other Red Hat solutions on AWS.”

Andy Jassy | CEO, Amazon



What is ROSA?

Red Hat OpenShift Service on AWS (ROSA)

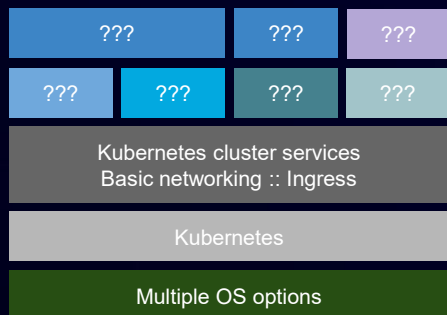
- Red Hat OpenShift Service on AWS (ROSA) provides a **managed OpenShift experience** integrated with AWS
- **Turnkey containerized application platform built on best of breed CNCF projects** with runtimes, developer tools, CI/CD, and monitoring built in
- Jointly engineered and maintained by **both AWS and Red Hat**



App platform comparison

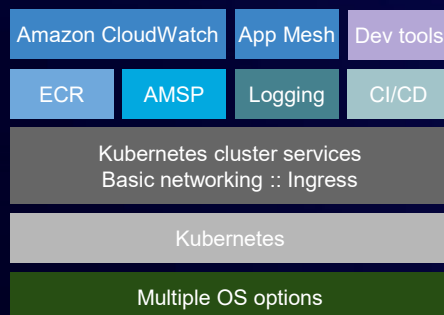
DIY app platform

- Full assembly required
- Unmanaged
- No defaults
- No integrations



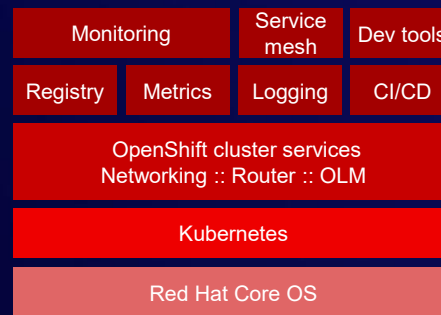
Amazon EKS app platform

- Some assembly required
- Managed control plane
- Some defaults
- Some integrations



OpenShift

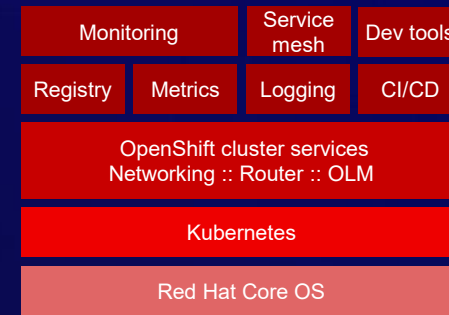
- No assembly required
- Self-managed
- Opinionated defaults
- Some integrations



ROSA

- No assembly required
- Managed platform
- Opinionated defaults
- Supported integrations

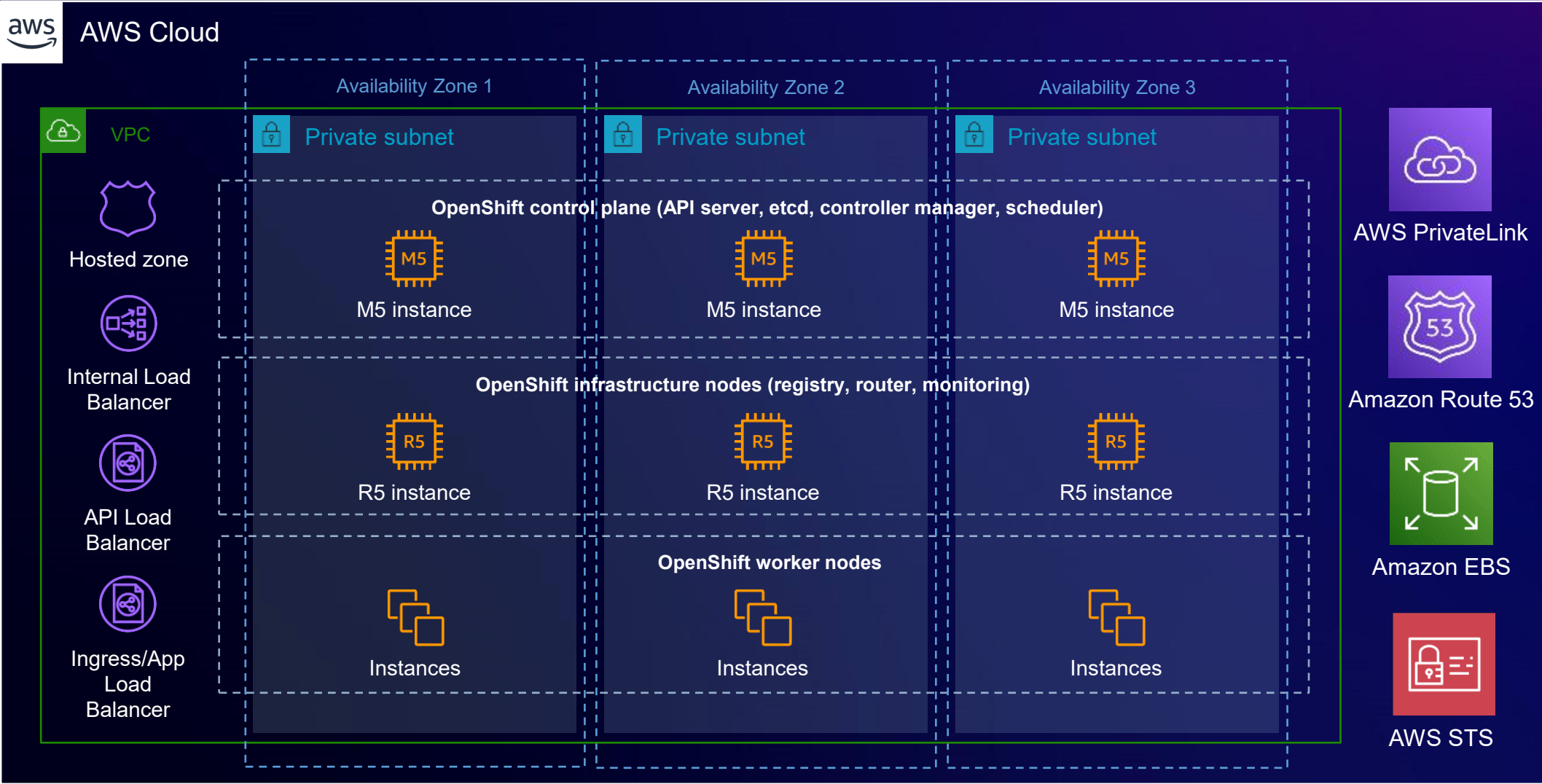
SRE and customer success



ROSA architecture overview



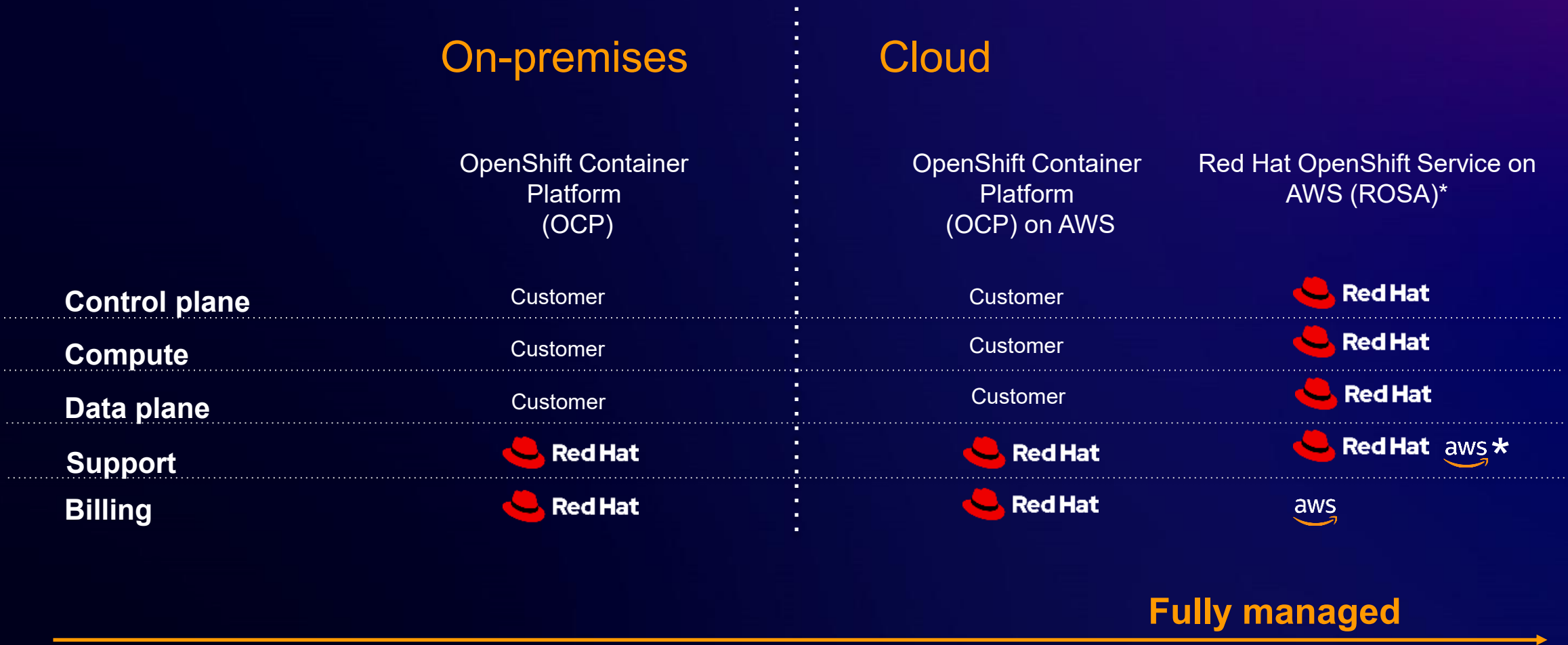
ROSA
cluster



Integrated AWS services



Shared responsibility model



* AWS Business Support Plan required
Detailed Responsibility Matrix: https://docs.openshift.com/rosa/rosa_policy/rosa-policy-responsibility-matrix.html



Benefits of ROSA turnkey application platform



Developers

Fully managed clusters in minutes to build, deploy, and run applications using built-in developer UI that abstracts the complexity of Kubernetes

Collaborate across teams via shared projects



Administrators

Standardized and streamlined operations across on-premises and AWS environments

Built-in monitoring, logging, and networking

Choose platform version upgrade as required for the business



Business leaders

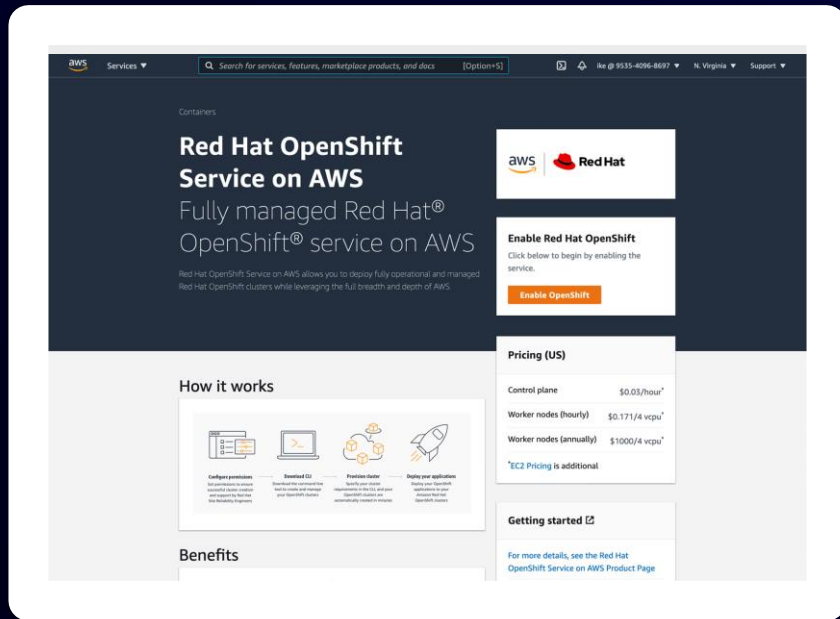
Consolidated billing and cost management across the business

Consumption-based pricing for surge and R&D usage

24/7 full-stack management and support

Financially backed 99.95% SLA

Red Hat OpenShift Service on AWS – Summary

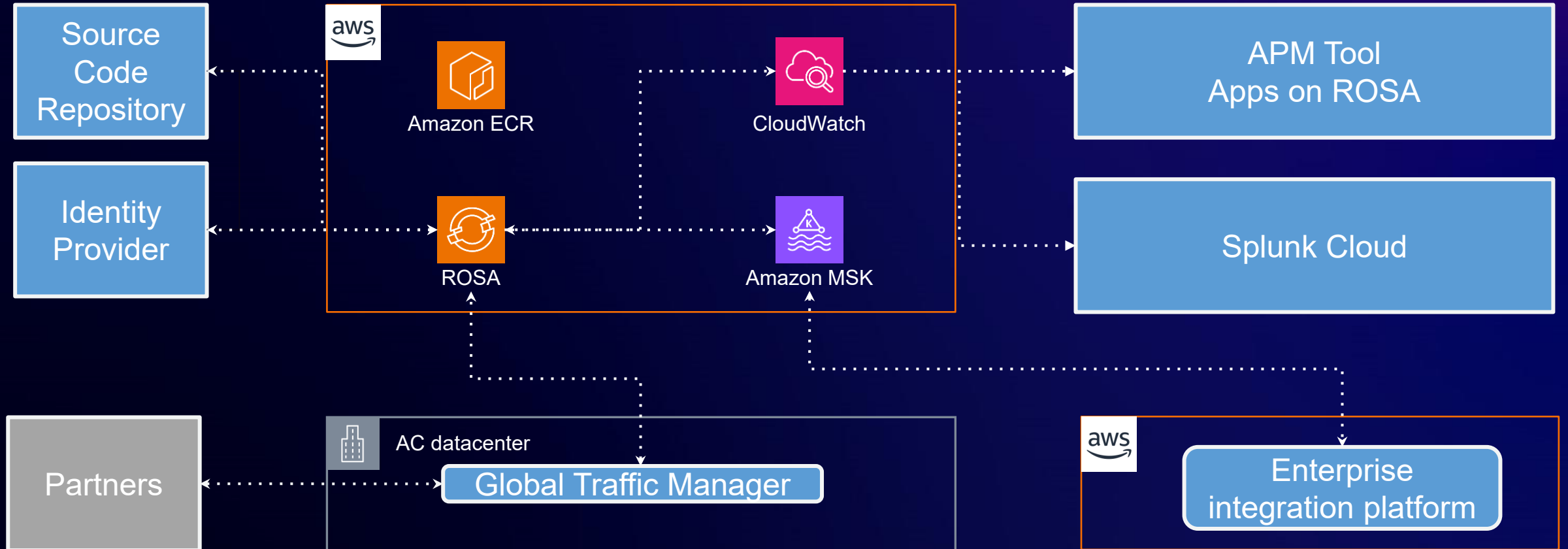


- Focus on **innovation** to add value to your business
- Reduce **operational** overhead
- Increase **scaling** capabilities
- Increase **security** and **compliance**
- No need to **re-architect** existing applications
- Helps to **accelerate** your modernization efforts

Air Canada's ROSA implementation

Where we ended up

THE FINAL SOLUTION



Where we ended up

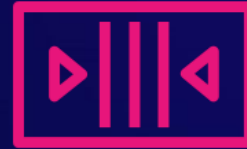
THE FINAL SOLUTION



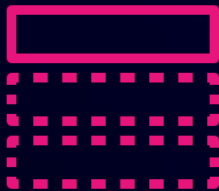
ROSA



MATIP
Client/Server



MQ Queue Manager



Kafka Topics



IBM App Connect

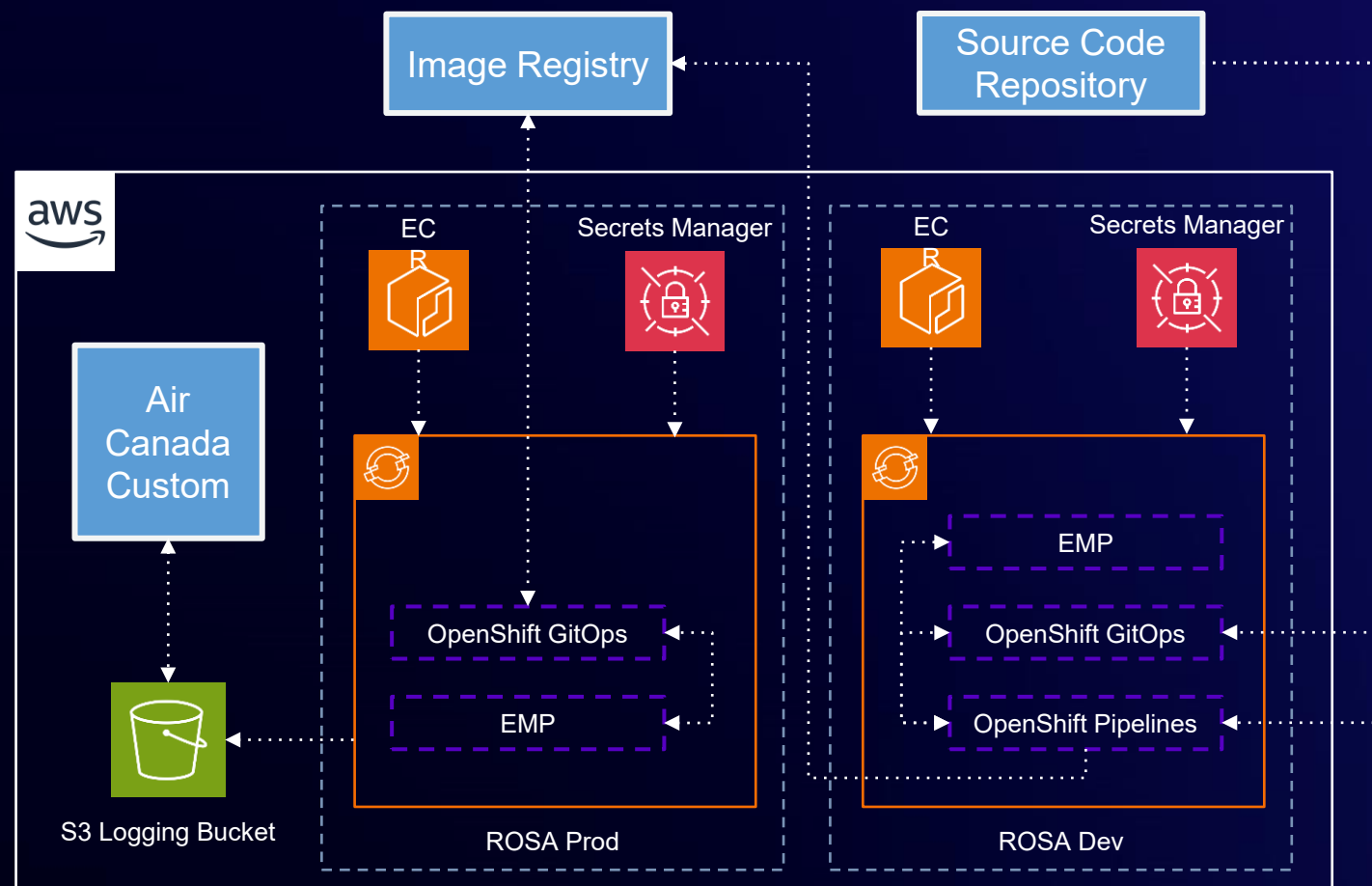


kafka

Kafka MirrorMaker

Where we ended up

DEVOPS AND GITOPS LOGICAL VIEW



Streamlined DevOps
and GitOps pipelines

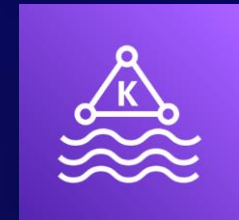
Faster and frequent
feature Delivery to
production

Developer/DevOps
Engineer led releases

Where we ended up

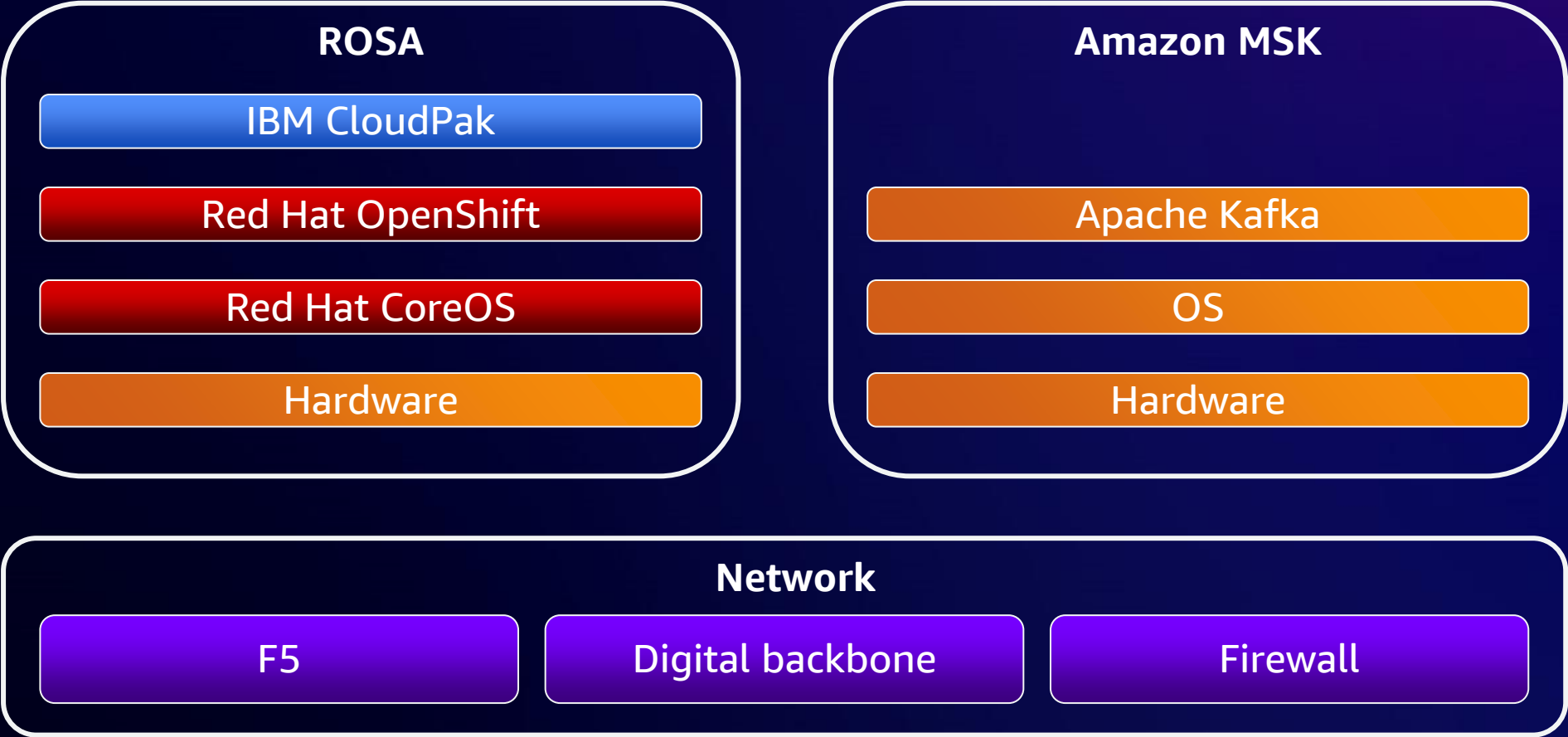
WHAT WAS ACHIEVED BY MODERNIZING ENTERPRISE MESSAGING PLATFORM

- Single centralized messaging platform
- Consumption-based model lead to a more cost-efficient approach
- Eliminate manual processes by way of CI/CD
- Increased deployment velocity from weeks/days to hours/minutes
- Shift to containerized builds
- Reduction in manual intervention
- Leverage managed services for complex configs



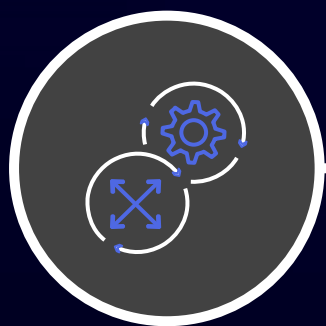
What worked well?

SUPPORT MODEL



What worked well?

OVERALL EXPERIENCE



**ENHANCED
SCALABILITY**



**IMPROVED
RELIABILITY**



COST SAVINGS



**STREAMLINED
OPERATIONS**



**ENHANCED CUSTOMER
EXPERIENCE**

A learning experience

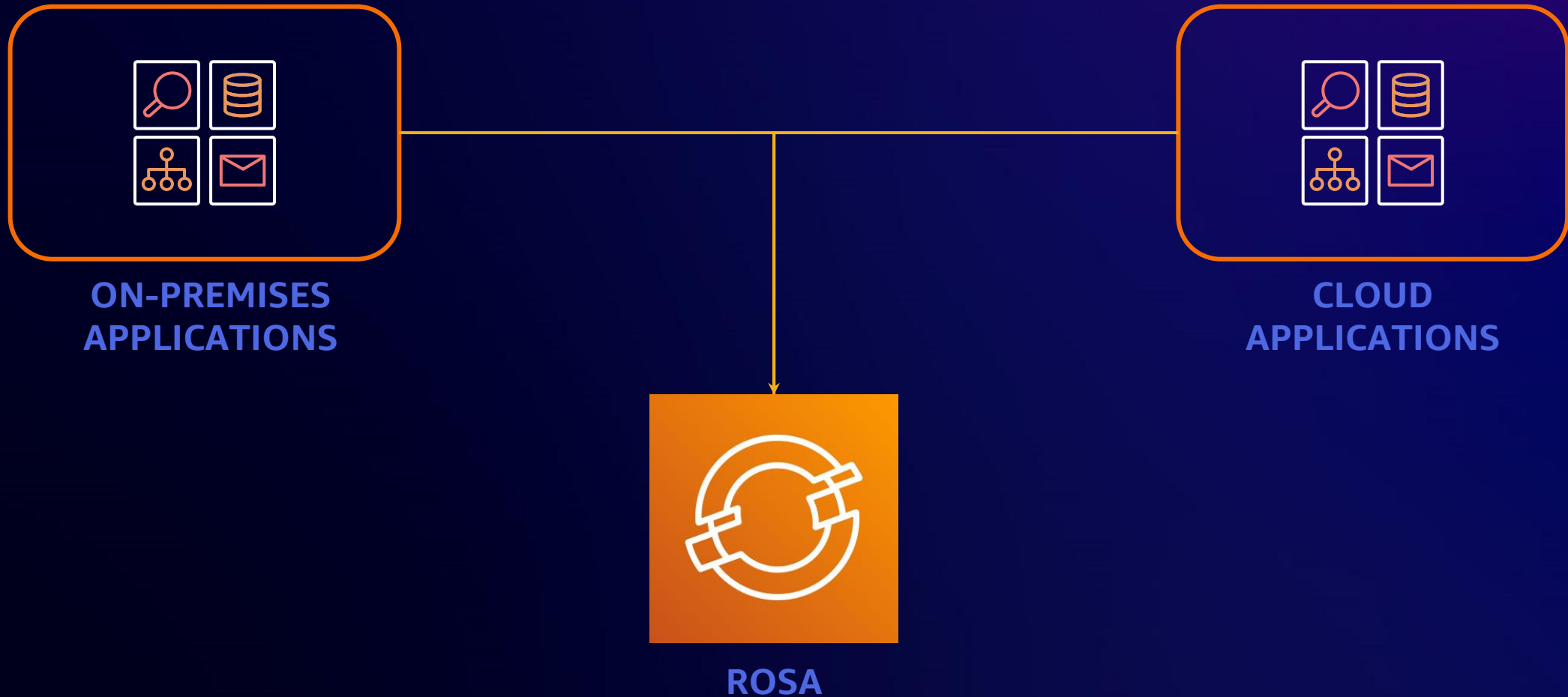
KEY TAKEAWAYS FROM THE AIR CANADA JOURNEY

- Discovery phase and planning is crucial
- Choose the right technology stack
- Collaborate effectively with AWS and Red Hat
- Continuous monitoring and optimization
- You may fail on the first attempt



What's next?

A LOOK AHEAD



Additional resources



[ROSA Product Page](#)
Main AWS ROSA web
page



[ROSA Pricing](#)
Pricing details for
ROSA



[ROSA Documentation](#)
AWS ROSA
documentation pages



[Air Canada](#)
Air Canada web site

Thank you!



Please complete the session
survey in the mobile app