
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

FSI309

Global Payments: From mainframe to microservices

Gabriel Braslavsky
SVP, Software Engineering
Global Payments

Krishna Sarvepalli
Senior Director, Product Engineering
Global Payments

Bobby Malik
Principal Solutions Architect
AWS

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Agenda

Introduction to **global payments**

Business and **technology** challenges

Cloud migration strategies

Migration journey in **5 steps**

Monolith to **microservices**

Migrating **messaging** and **auth** applications

Next steps

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

A complete worldwide commerce ecosystem. **Delivered for you.**

Our innovations and expertise drive growth for millions of companies—from ambitious startups to financial institutions and global enterprises.



COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED

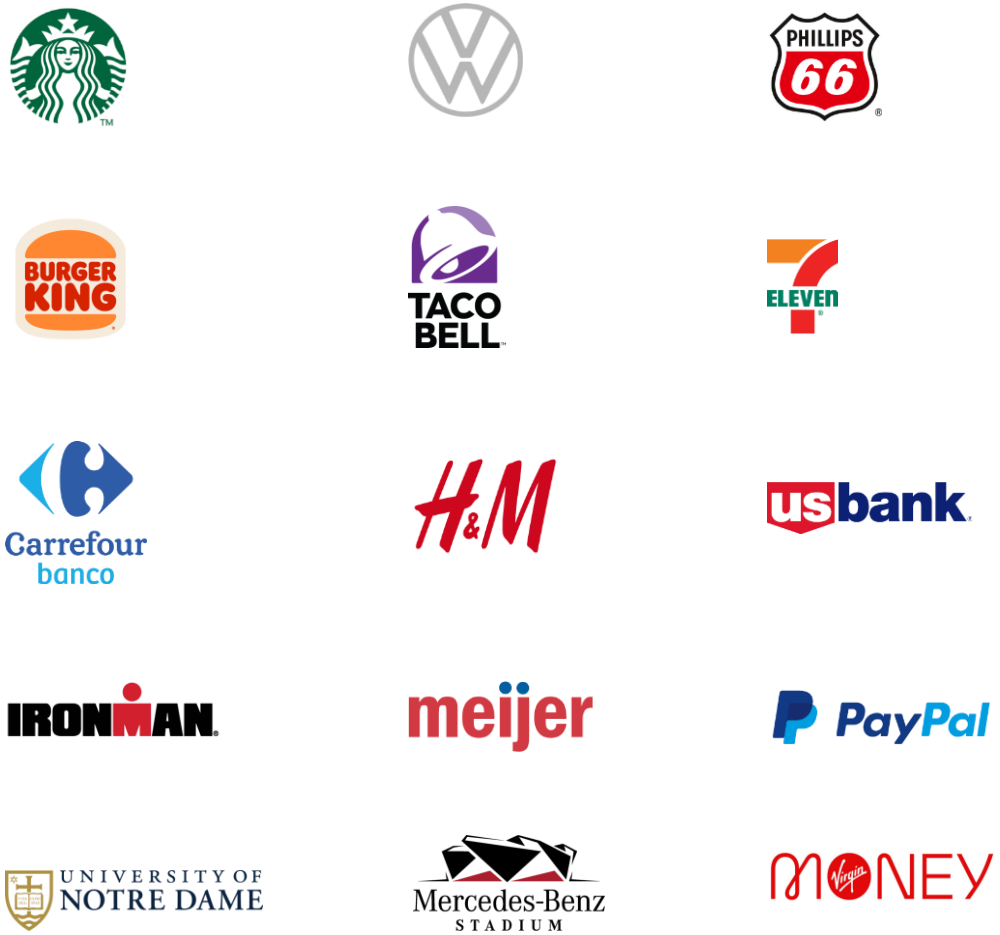
Trusted by

4 million
companies

1,500
financial institutions

>4,000
tech partners

100+
verticals



COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED



A truly **comprehensive** payments platform

With a simple integration, you get access to the whole Global Payments ecosystem. Our market-leading technology connects every aspect of commerce.

COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED

A global powerhouse. At your side.



$7.4b
adj net revenue

~59b
transactions annually

~4.0M
merchant locations

1,500
financial institutions

170+
countries

~25,000
team members

COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED

Your local partner with **a global perspective**

170+
countries served

3,500+
global sales and support staff

38
countries with a physical presence

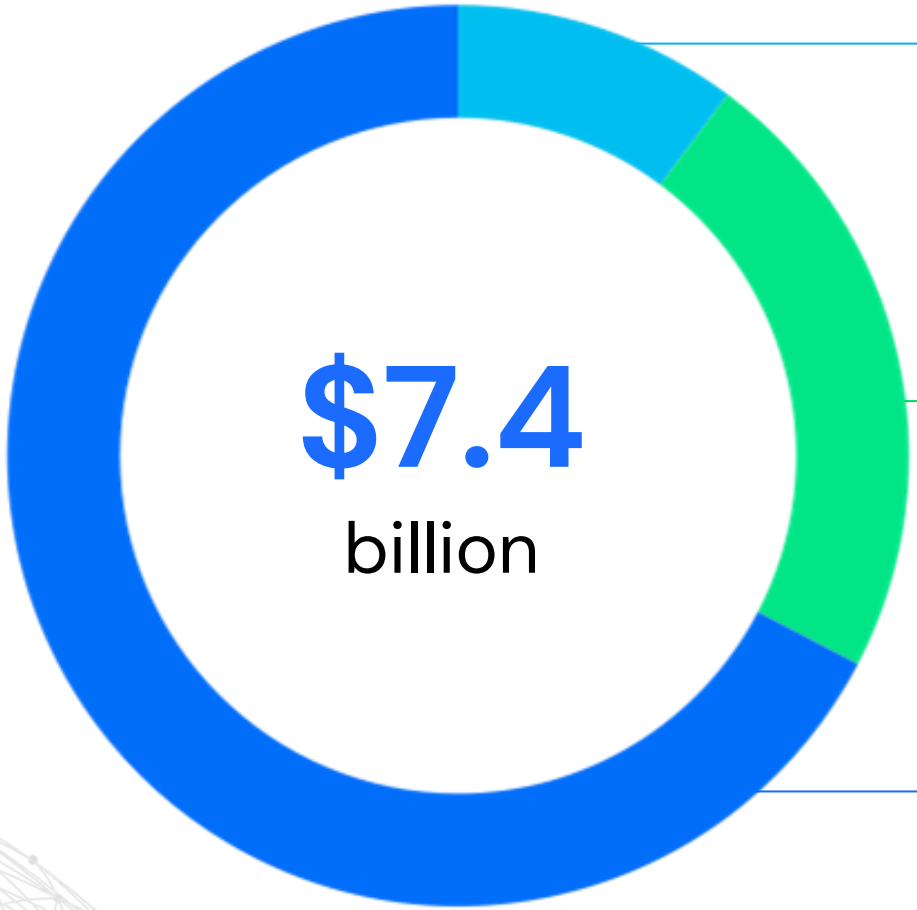




COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED

globalpayments

A connected commerce ecosystem





11%
business and consumer solutions



23%
issuer solutions



66%
merchant solutions

COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED



MERCHANT SOLUTIONS

Industry-focused software and payments to power growth

- Online payments
- Unified Commerce Platform
- Integrated payments
- Software-driven business solutions
- Mobile point-of-sale solutions
- Point-of-sale solutions
- Internet of things
- Omnichannel commerce

Our clients

Leader
in integrated payments globally

140
alternative payment methods

100+
verticals

3,500+
sales professionals

COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED



ISSUER SOLUTIONS

Cloud-powered digital acceleration for issuers

- An end-to-end issuer platform
- API-enabled, cloud native solutions
- Full global capabilities
- Unmatched distribution

Our clients

usbank · permanent tsb · Carrefour banco · advanzia

Leader
in US, Canada,
UK, Ireland, and China

#2
issuer in
Western Europe

696M+
traditional accounts on file

29b+
cardholder transactions

COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED

Market need and why we are **investing in the Cloud**

By harnessing the cloud, we have the ability to offer new experiences, new cardholder journeys, and an expansion of new products, all at scale—a true product centered delivery and operating model



Cloud & open banking in a secure environment



Speed to market worldwide



API-centric product flexibility



Frictionless, digital consumer experience

COPYRIGHT GLOBAL PAYMENTS 2022 ALL RIGHTS RESERVED

Business challenges



Expand into geographies



Quickly prototype and innovate



Manage growing infrastructure



Diminishing pool of talent



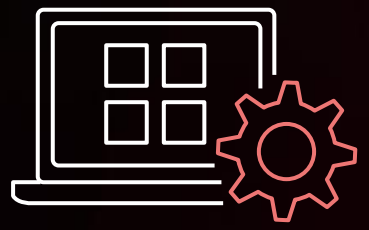
Seasonal spikes

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration challenges



Regulations & security



Mission-critical applications



Low latency & high throughput workloads

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Diverse workloads built over 40 years



REST APIs, SOAP, legacy messaging



Progressive web apps, server-side pages, native mobile experiences



Realtime apps (ISO 8583, ISO 20022 protocols)



Event streaming & sourcing, MQ message publishers



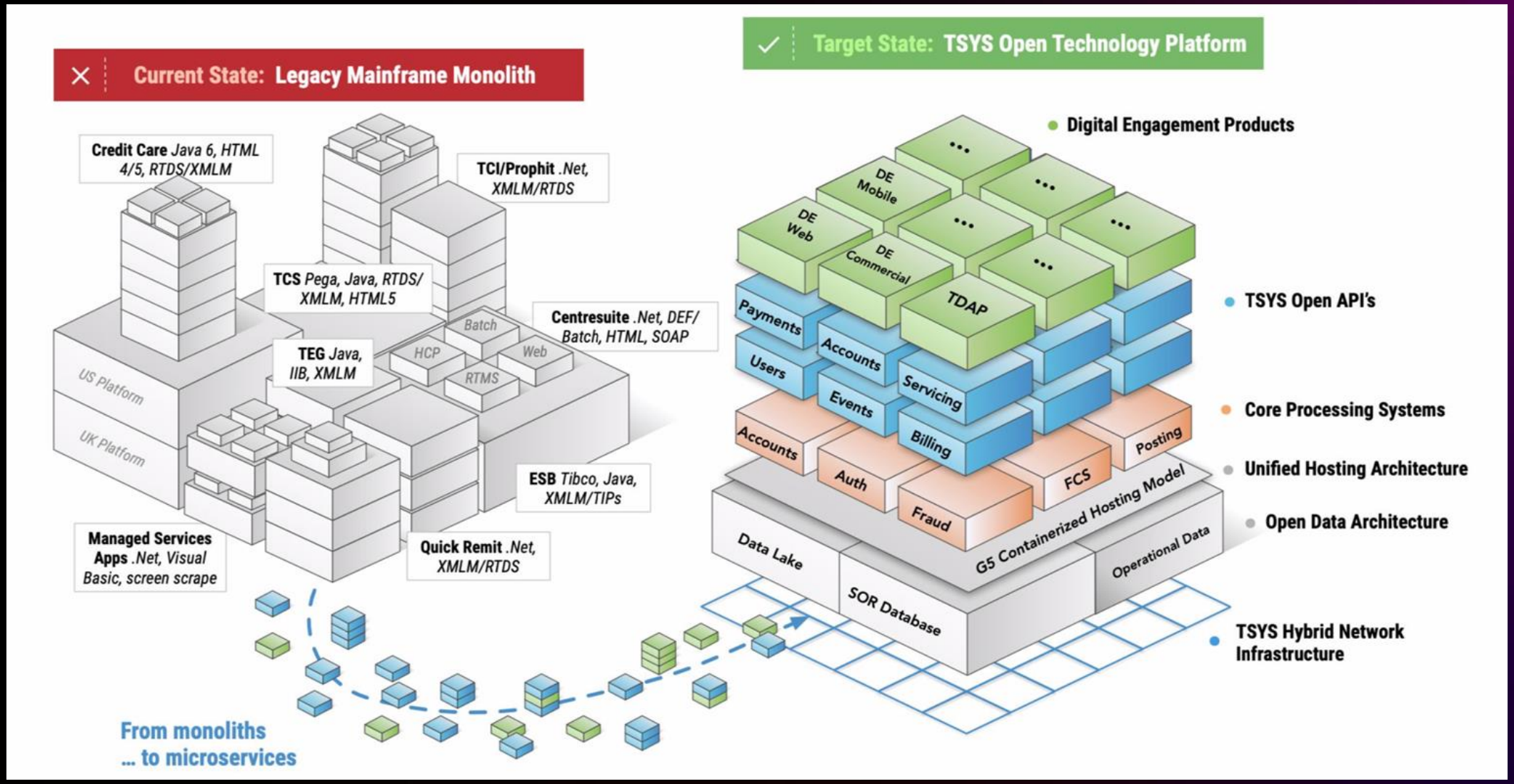
Batch processing workloads with custom file formats



Data mesh, data lake, custom reporting & analytics

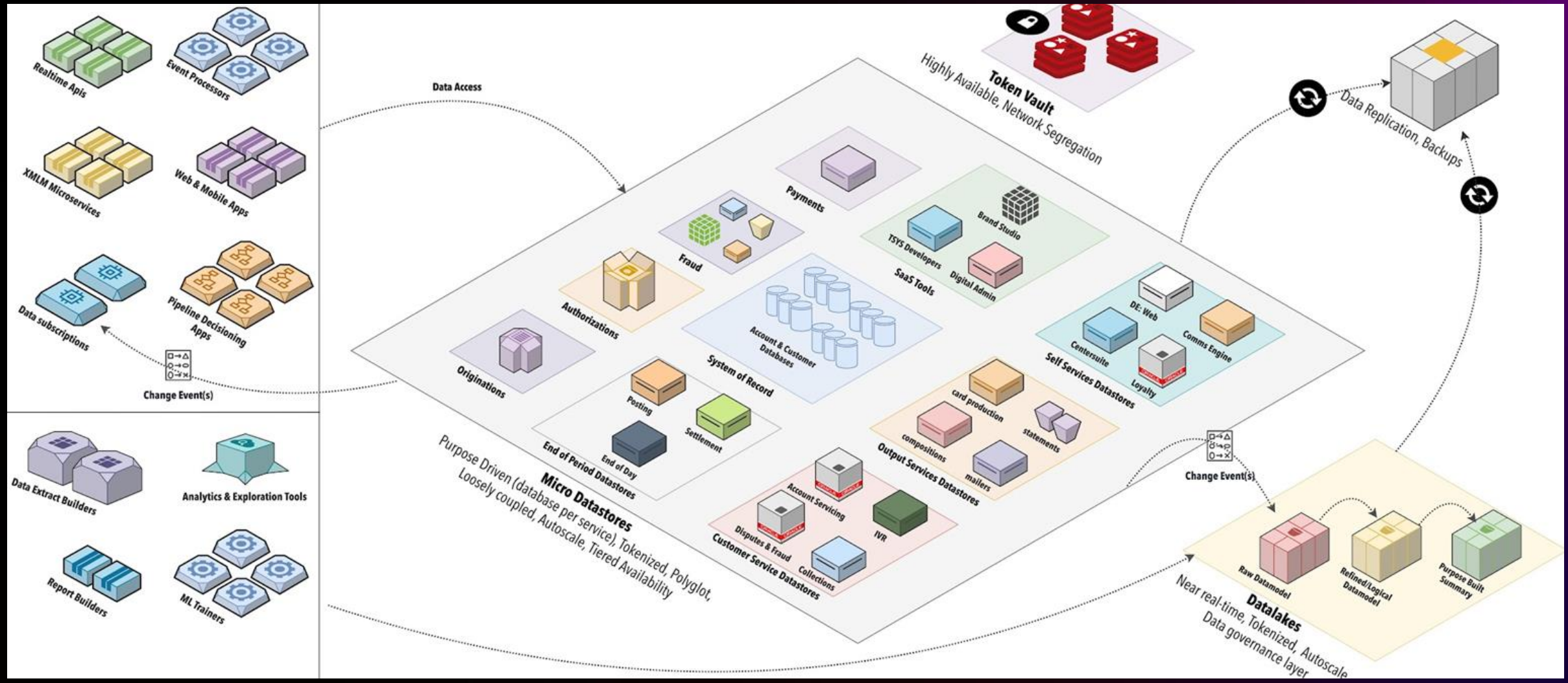
© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Monolith to microservices



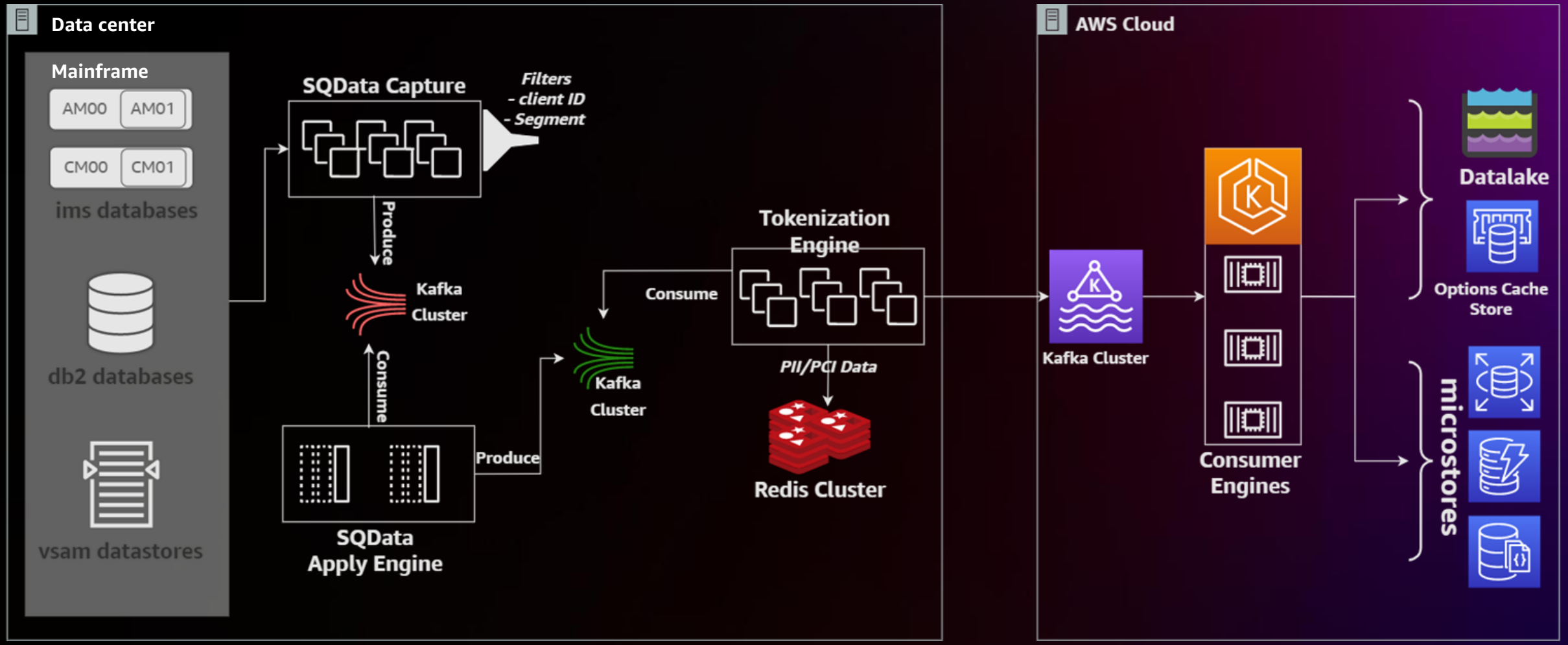
© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Microservices architecture



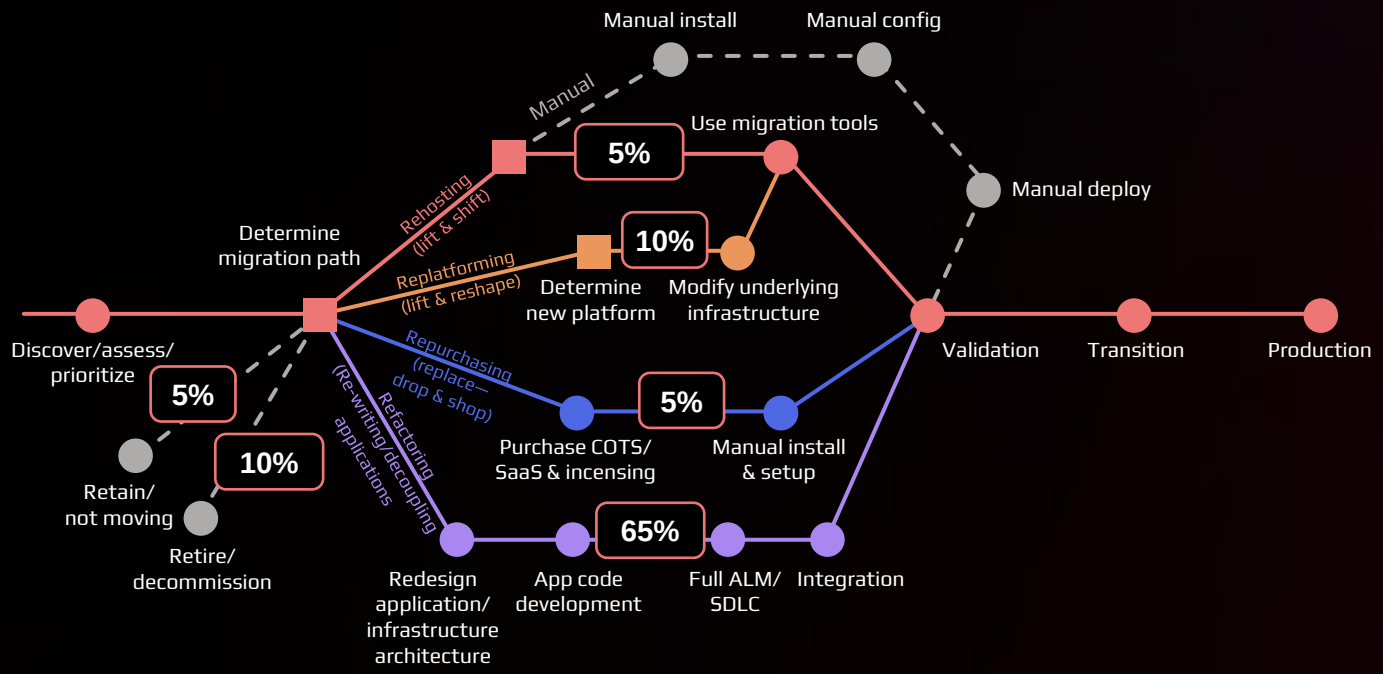
© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

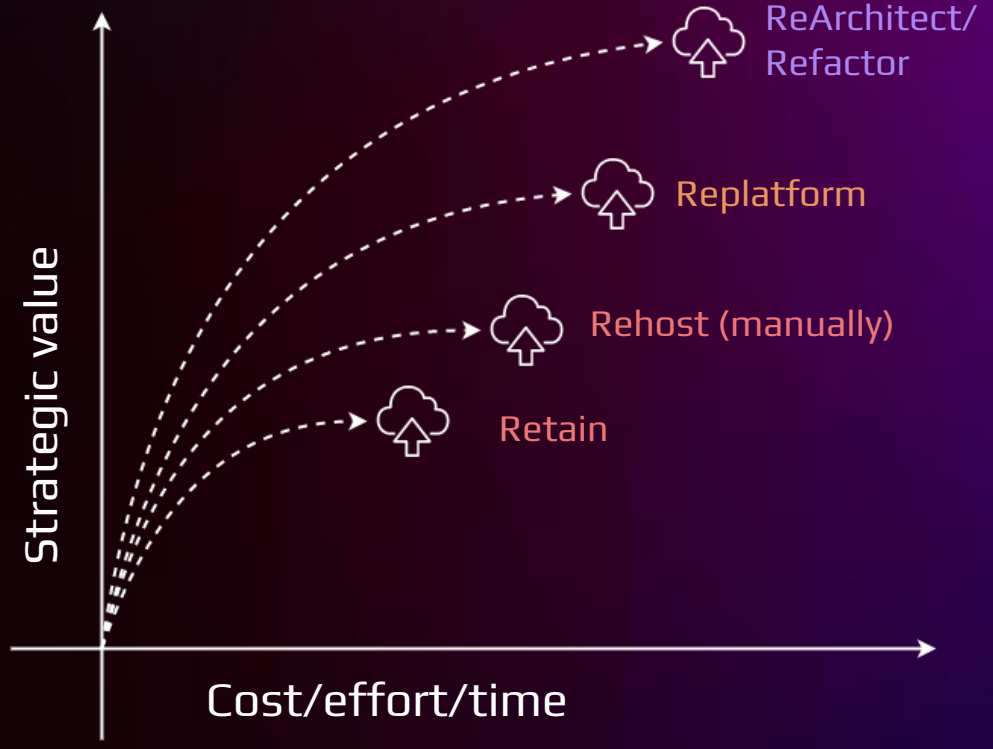
DataSync—syncing mainframe data to cloud



© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration—6R strategies





6 strategies for migrating applications to the cloud (by Stephen Orban)
https://aws.amazon.com/blogs/enterprise-strategy/6-strategies-for-migrating-applications-to-the-cloud/

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration: our journey in 5 steps

Step 1: Build a canary migration roadmap

- Break down monolithic systems into logical groups of apps
- Sequence them into a logical migration pipeline

1. Internal apps with low client dependency



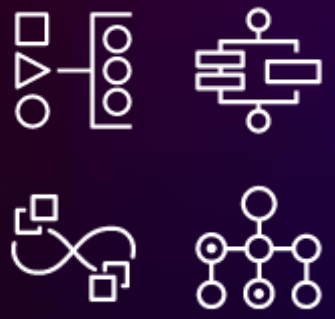
2. Data mesh, reporting, analytics, data science platforms



3. APIs, web, mobile, event handlers, digital apps



4. Core processing systems with complex and proprietary technology



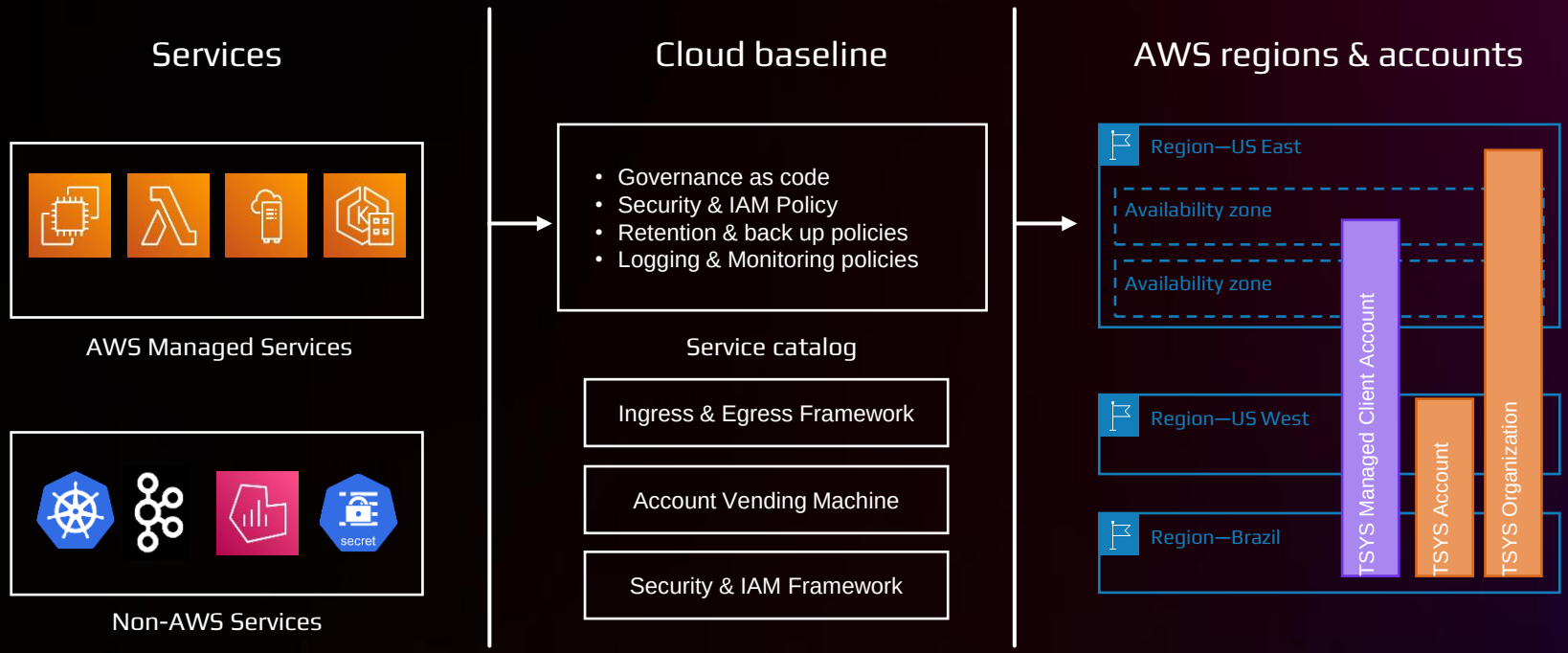
aws

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration: our journey in 5 steps

Step 2: Build cloud baseline, security & frameworks

- Standardization among thousands of engineers, applications and platforms is a must
- Compliance, security and infrastructure—**100% as code**

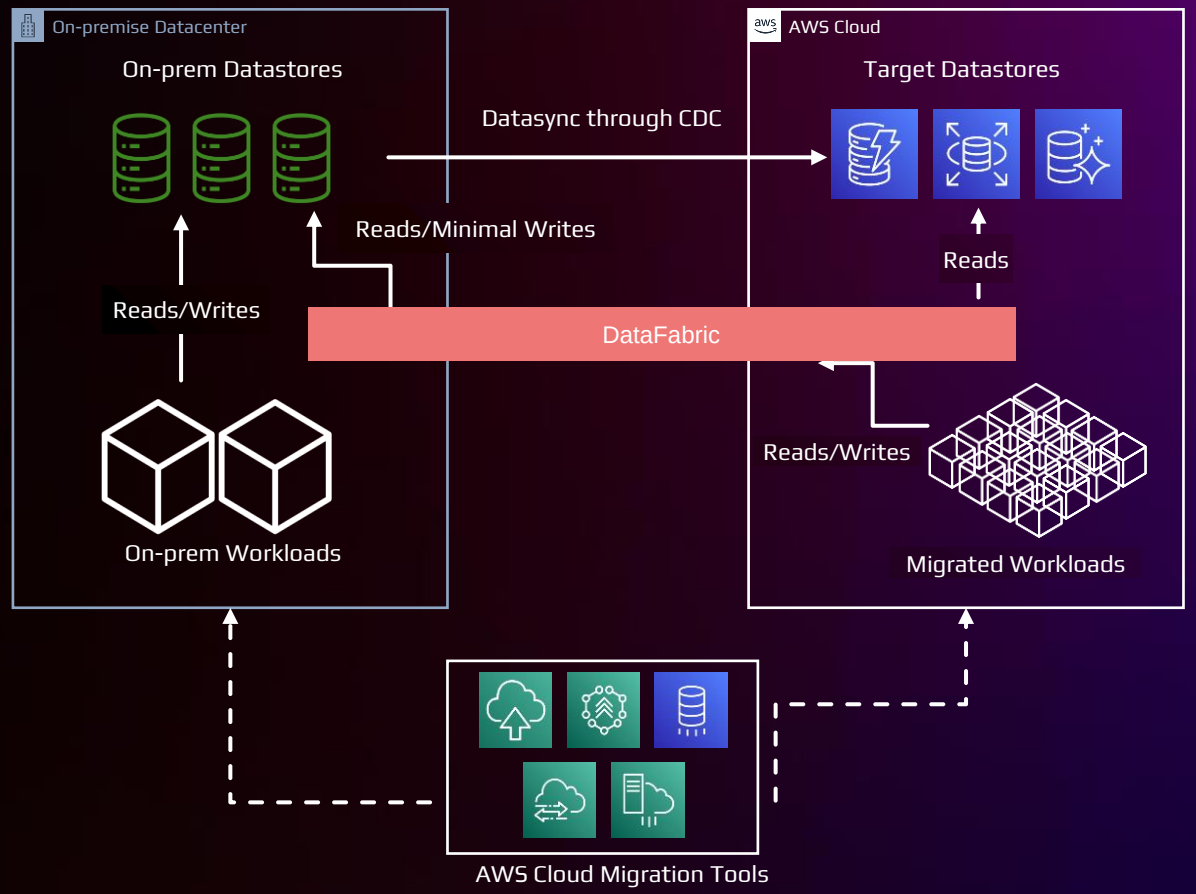


© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration: our journey in 5 steps

Step 3: Address the data problem

- Break down the system of record (SOR) into logical **microstores**
- Foundational **data platform** is a must for successful migration
- **Data sync** between cloud and on-prem datastores with CDC
- **DataFabric** to implement CQRS pattern for migrated workloads

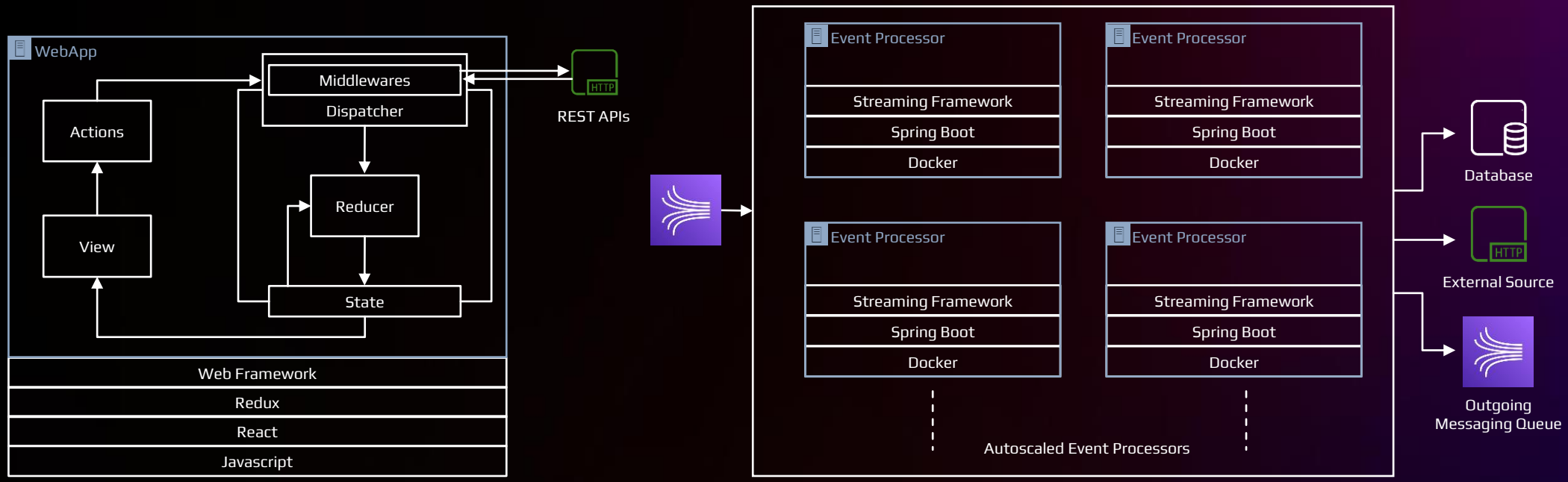


© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration: our journey in 5 steps

Step 4: Build a repeatable reference framework for each “archetype”

- Build reference architecture, framework and code to create a pattern for migration
- Adhere every application to follow one of the reference frameworks



© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Cloud migration: our journey in 5 steps

Step 5: Iterate, learn and repeat

- Fail fast and Iterate in non-production environments
- Apply canary patterns for the traffic switchover
- Make customers part of the journey and build confidence with the results & data
- Take advantage of AWS Managed Services and AWS Migration Services

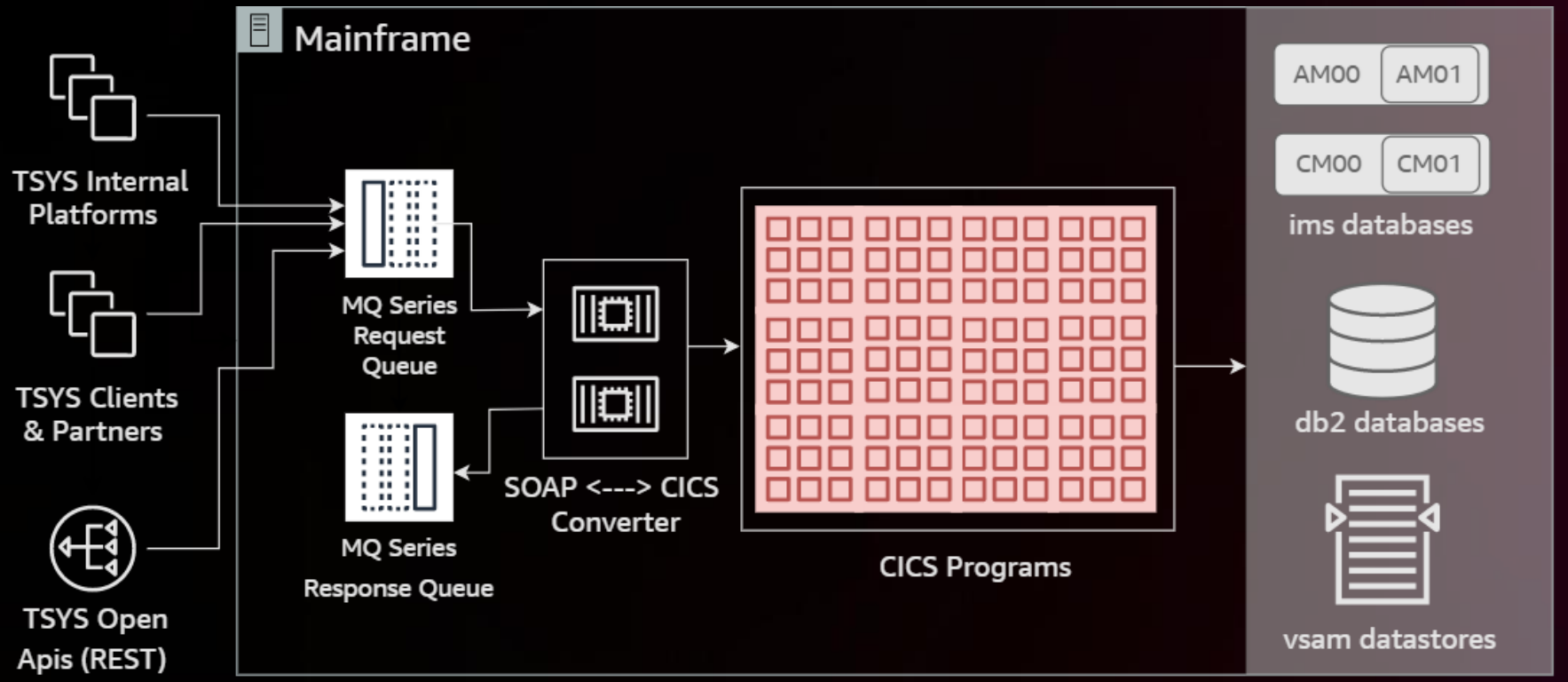


© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Messaging Modernization Use case

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

XMLM Messaging Services—mainframe

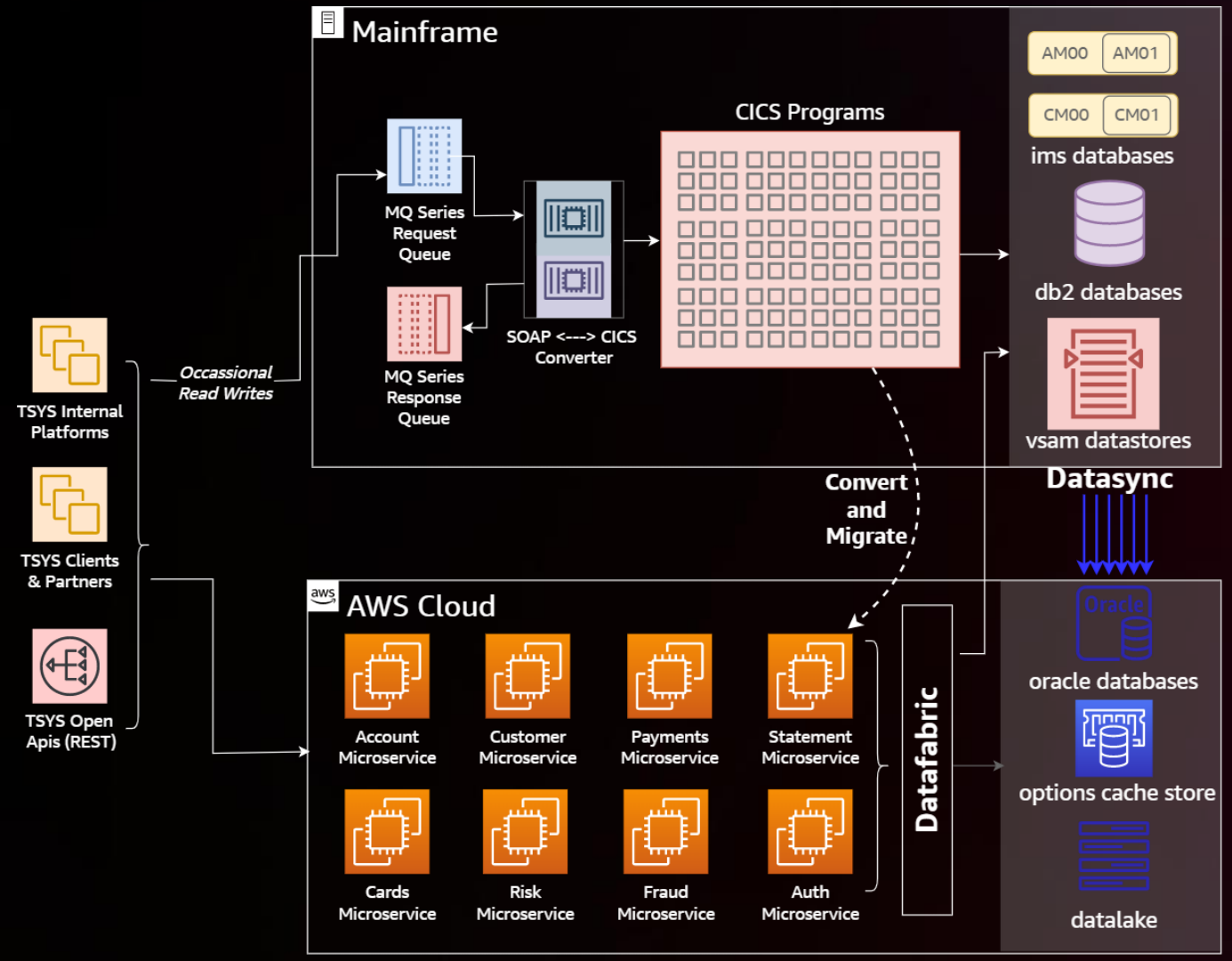


Mainframe state:

- Use **CICS Programs** to access data from DB2 or VSAM
- **MQ based mechanism** for communicating with mainframe
- Build **microservices** and expose REST APIs using the existing MQ communication

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

XMLM Messaging Services—migration phase

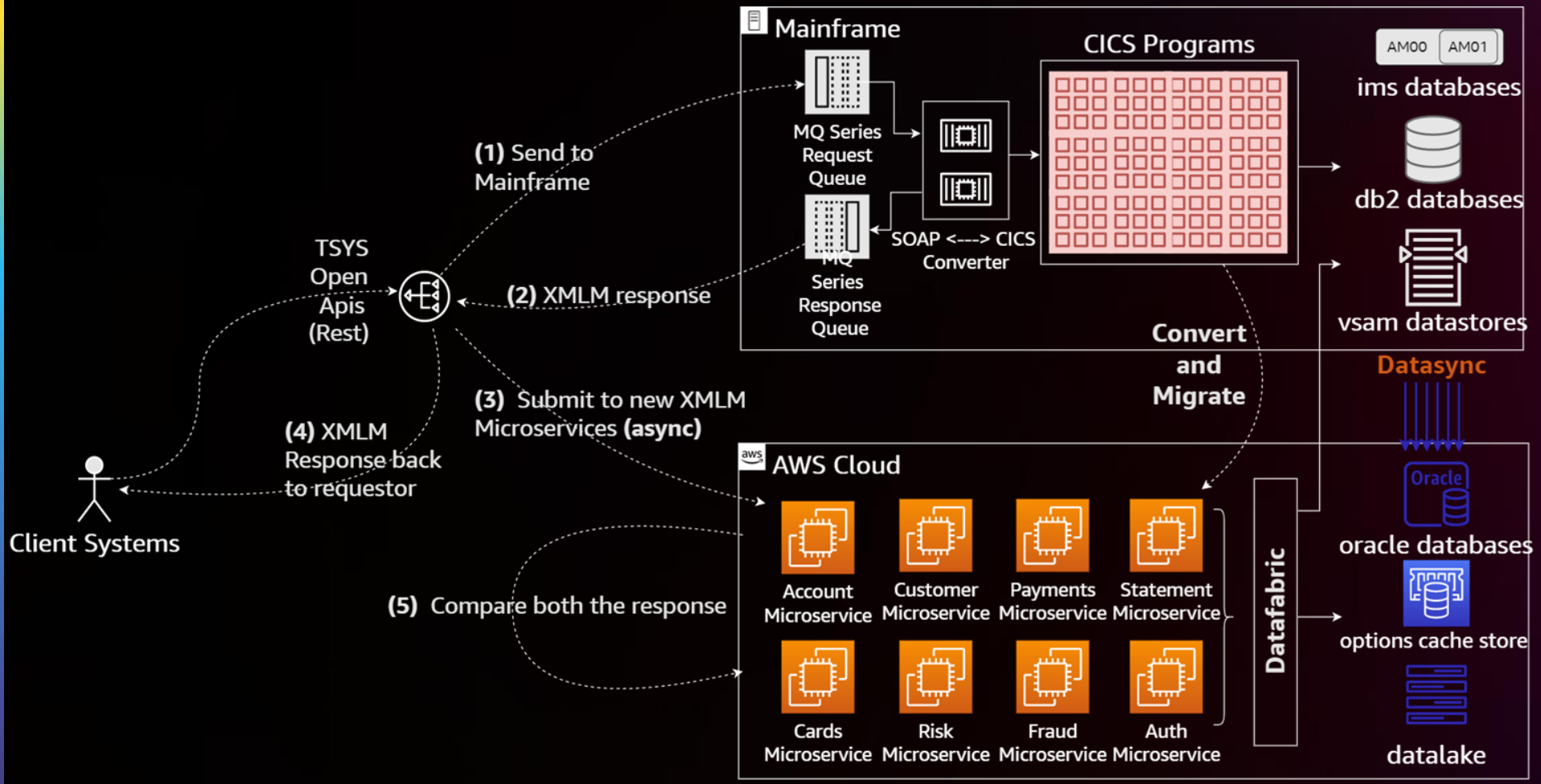


Migration phase:

- **Data Fabric** layer for accessing IMS mainframe segments
- Modernize the packets **and route all the traffic to** distributed microservices

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

XMLM Messaging Services—parallel testing

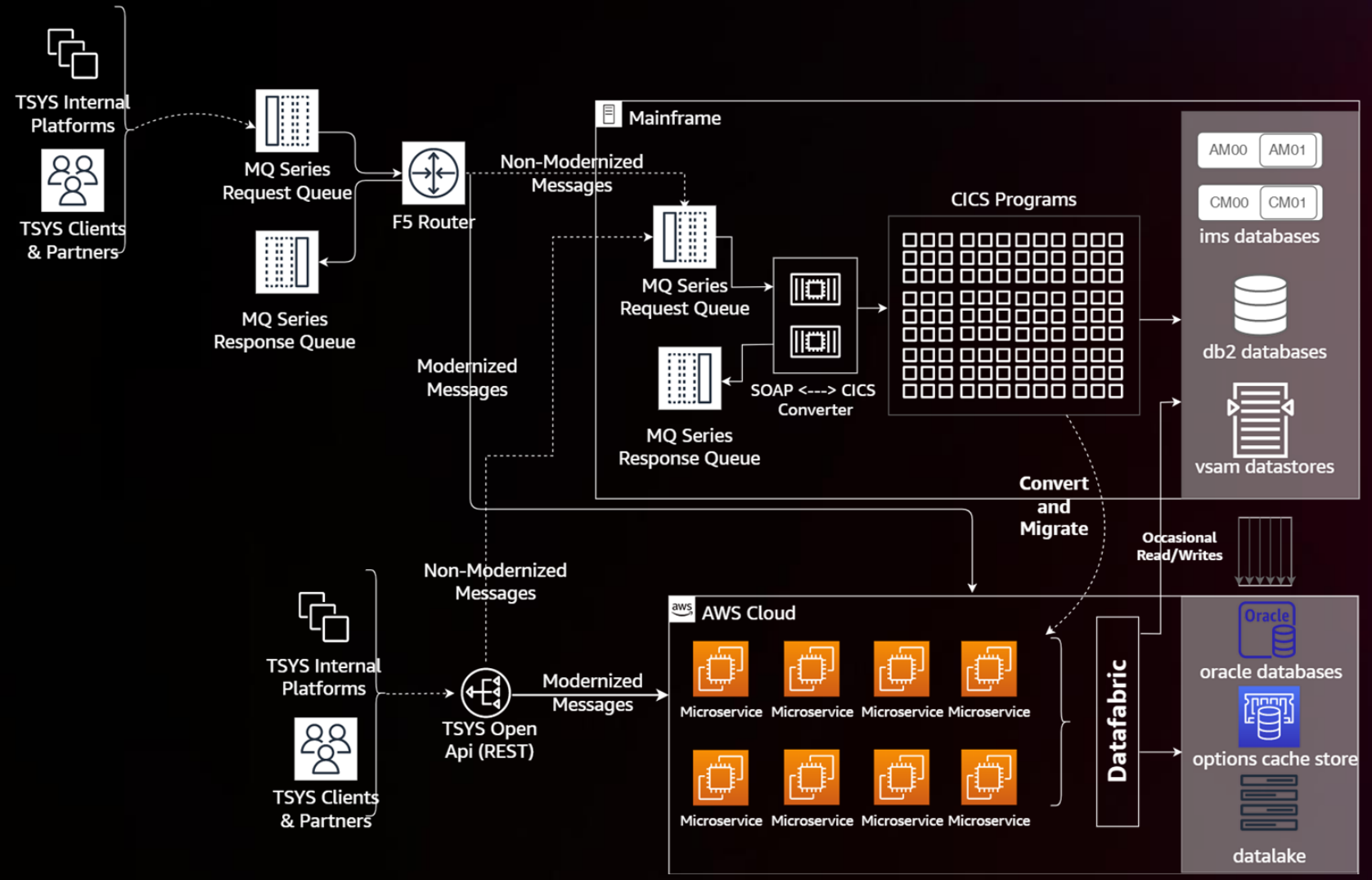


Parallel testing:

- **Asynchronously** submit requests to new system
- **XMLM response** from mainframe and response from distributed microservices will be compared

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

XMLM Messaging Services—canary phase



Migration phase:

- **Data Fabric layer** for accessing IMS mainframe segments
- **Reduce MIPS consumption** of mainframe by routing all GET calls to distributed microservices
- **Sync (1-way) data** from IMS to distributed data stores

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Auth Modernization Use case

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Auth modernization use case



Customer swipes credit card for $xx

Merchant bank

Card networks

Issuer bank/payment processor

Approve/decline authorization



© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Auth modernization goals



Multiple geographies & regulatory environments



Multiple domain areas—consumer, commercial, debit & healthcare



High throughput and low latency architecture to support 1,000s of TPS



Security at forefront using tokenization information



Multi region active-active traffic handling

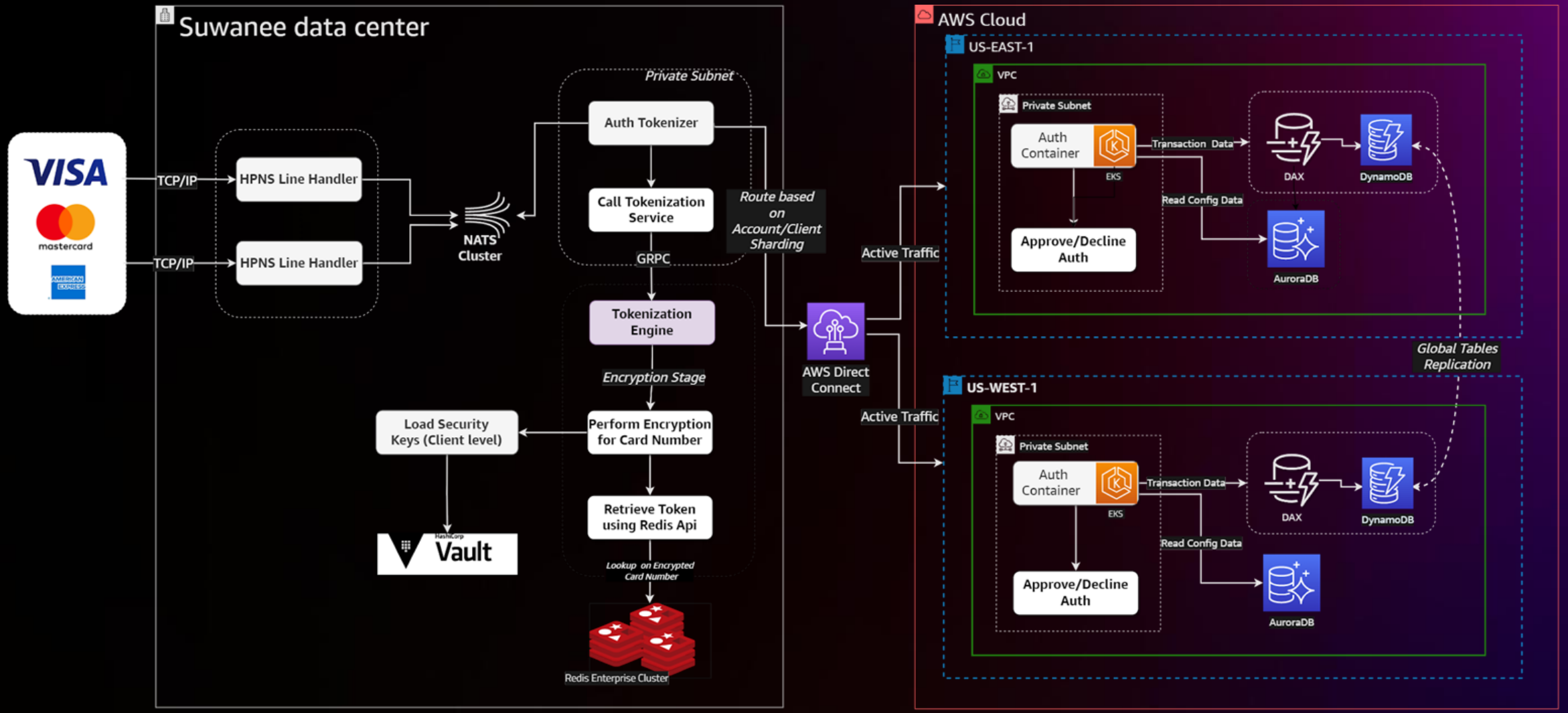


Auto-scaling & resiliency

aws

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

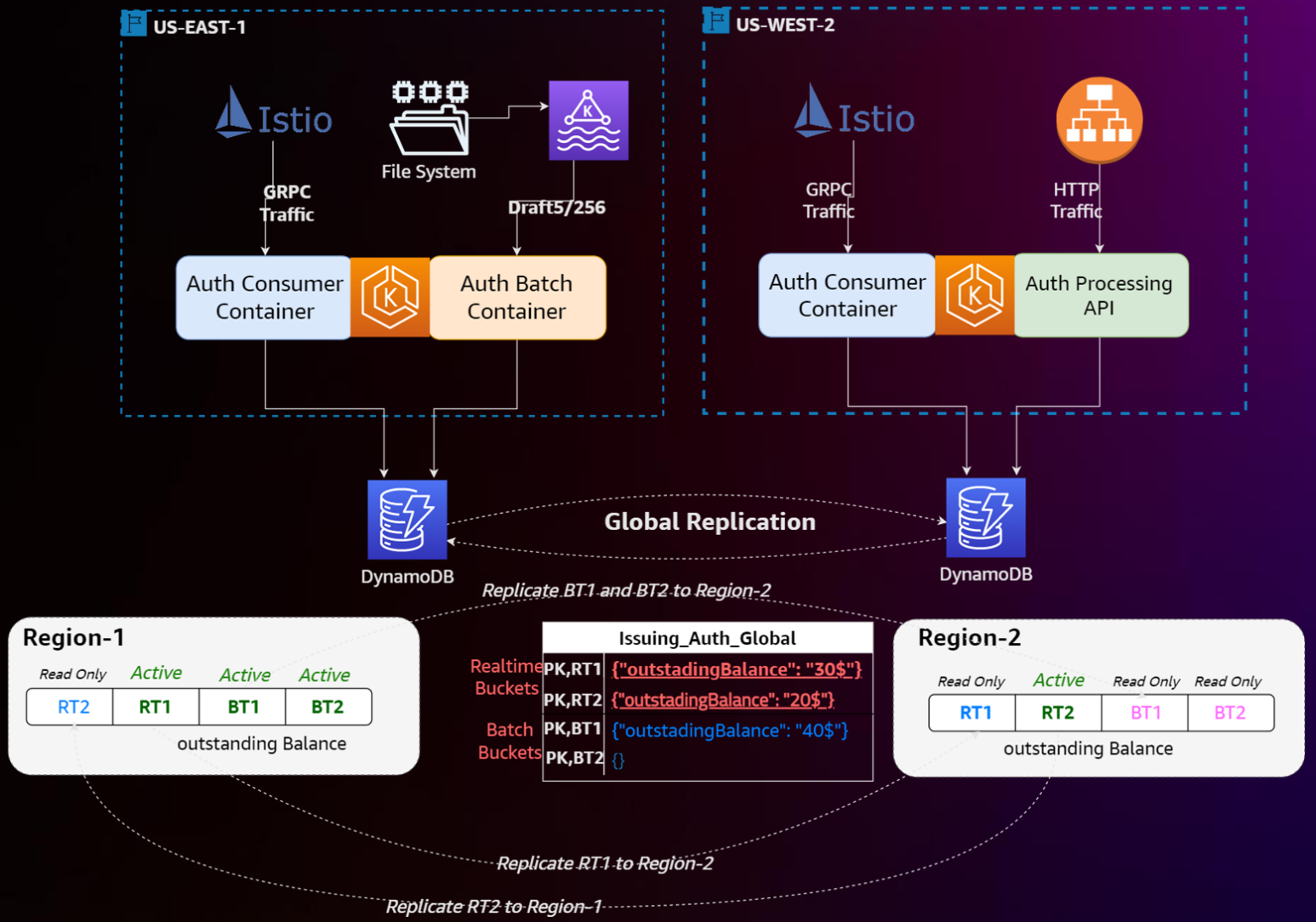
Auth modernization—ReArchitect



© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Auth modernization—ReArchitect

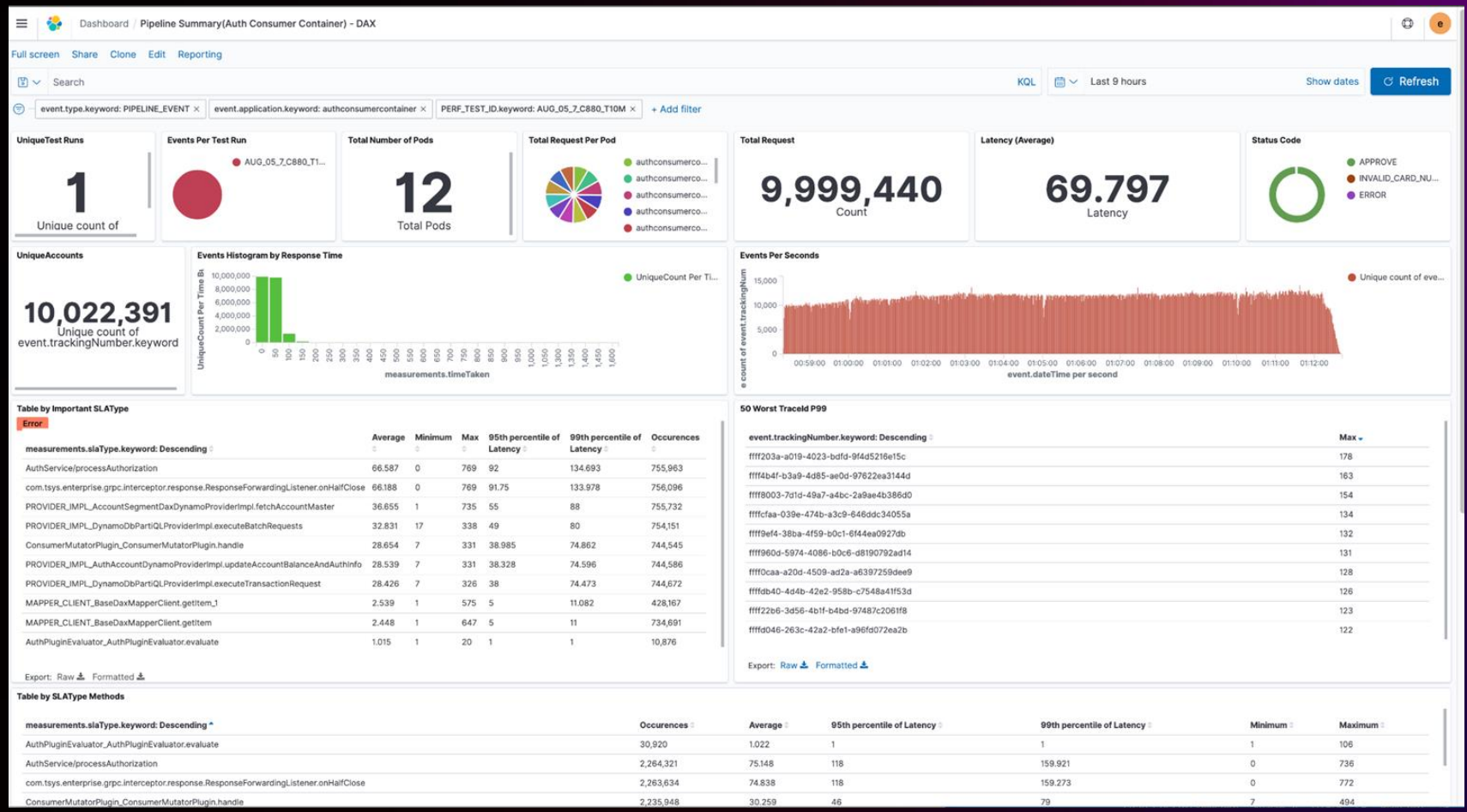
- **Visa, MasterCard, Amex** and various card platforms support
- Hybrid platform approach, **on-prem to cloud connectivity**
- **Multi region active-active** strategy



© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Auth modernization—performance stats

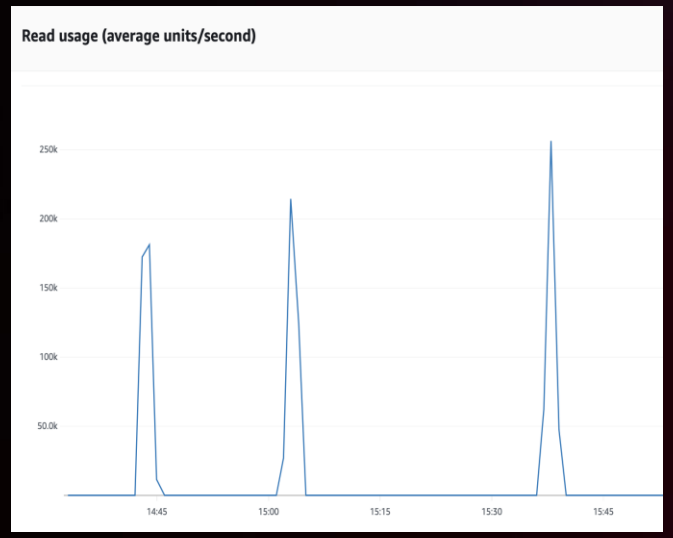
- Achieved **10,000 TPS goal**
- Latency under **100ms**
- **Optimize time taken for** Dynamo Reads **and** Writes

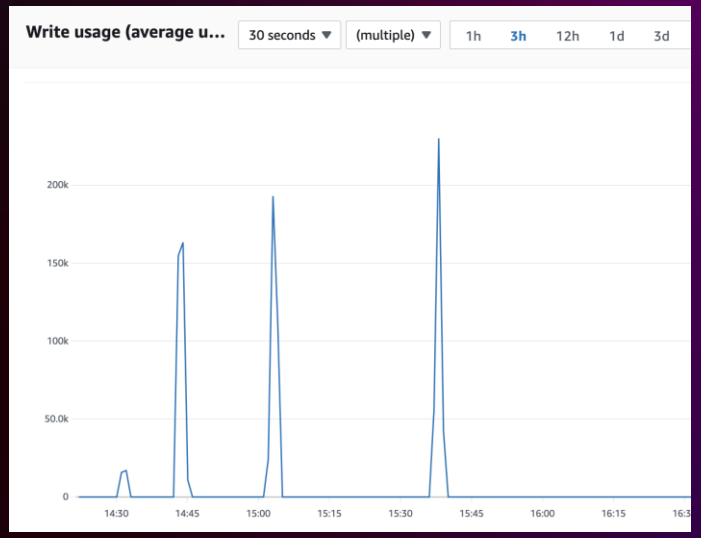


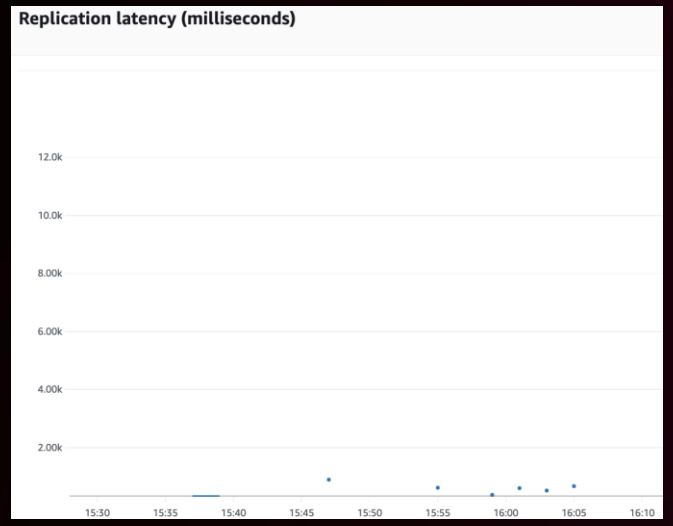
© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

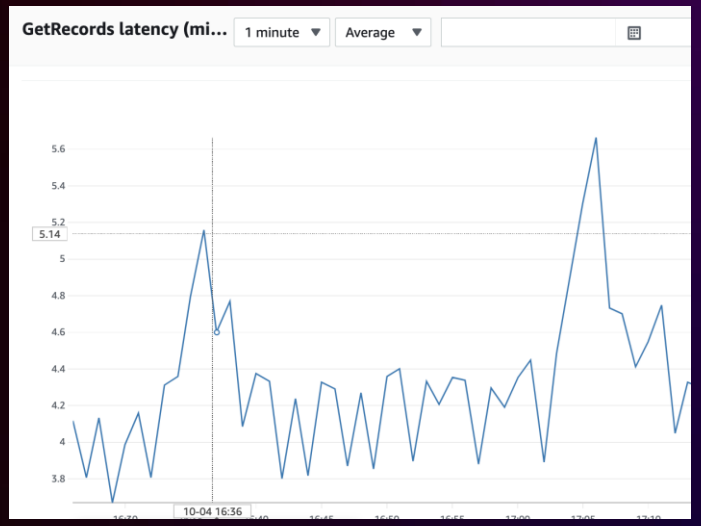
Auth modernization—DynamoDB metrics

- **On-demand** mode for RCU/WCU
- Observed replication latency is under **400–600ms** for the test runs
- On average RCU and WCU are touching at **50k Reads/second** and **200k Writes/second**









aws
© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Next set of migrations

Posting & settlements

Data **subscriptions**

Customer onboarding

Cards management

Statements platform

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Thank you!



Please complete the session survey in the **mobile app**

© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.