

The background features a vibrant blue gradient with subtle, wavy horizontal lines. A diagonal band of lighter blue and green runs from the top right towards the center. The bottom right corner is dominated by a large, flowing shape in shades of purple, pink, and orange, resembling a stylized wave or a modern architectural element.

# aws SUMMIT

INDIA | MAY 25, 2023

MIG004

# Transforming post-trade processing in the cloud for zero down time with cross-region resiliency

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Brokerage Platform, Fidelity Investments

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# Agenda

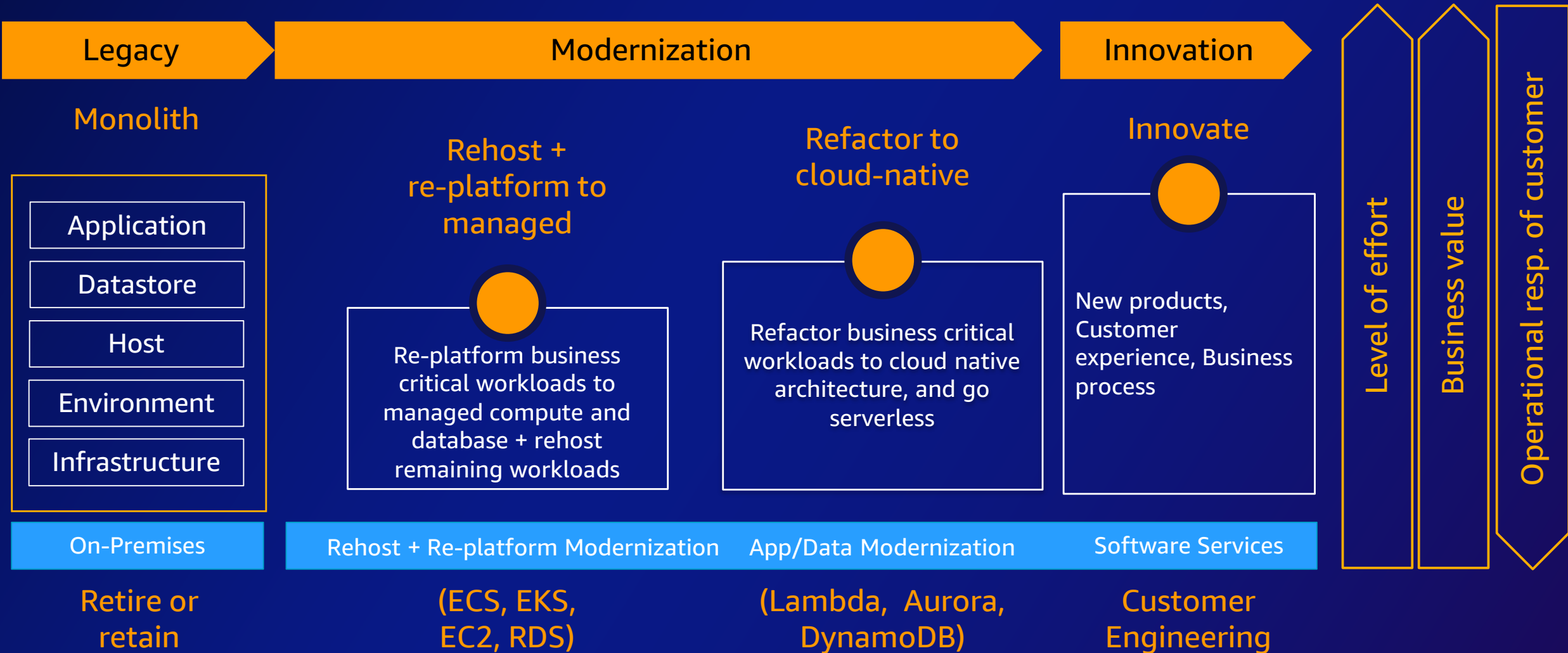
- Current modernization trend
- Trade flow & trade processing system overview
- Trade processing system & NFR's
- Trade processing system AWS Ecosystem
- Challenges & learnings with hybrid cloud
- Design principles
- Hot-hot event driven architecture & design
- Learning & experience

# Organizations are moving legacy applications and data to the cloud



**>50%** of enterprise workloads and data are expected to be in a public cloud within 12 months

# Modern cloud adoption journey



# Cloud modernization pathways

PRESCRIPTIVE GUIDANCE TO ACCELERATE CLOUD MODERNIZATION

## Move to cloud native architecture



Agile, scalable apps built on containers, serverless and microservices

## Move to managed cloud services



Deploy applications rapidly and operate reliably at scale with managed services

## Move to managed databases



Open source, fit for purpose, highly scalable databases

## Move to open source



Freedom from proprietary licensed software with open source technology

Prescriptive guidance to accelerate cloud modernization available using EBAs, delivery kits and partner offerings

Monolith > Microservice

Event Storm Workshop

EKS/ECS Accelerator

MSSQL > RDS

EKS/ECS Accelerator

MSSQL / Oracle > RDS

Apache MQ > AmazonMQ

MSSQL > RDS

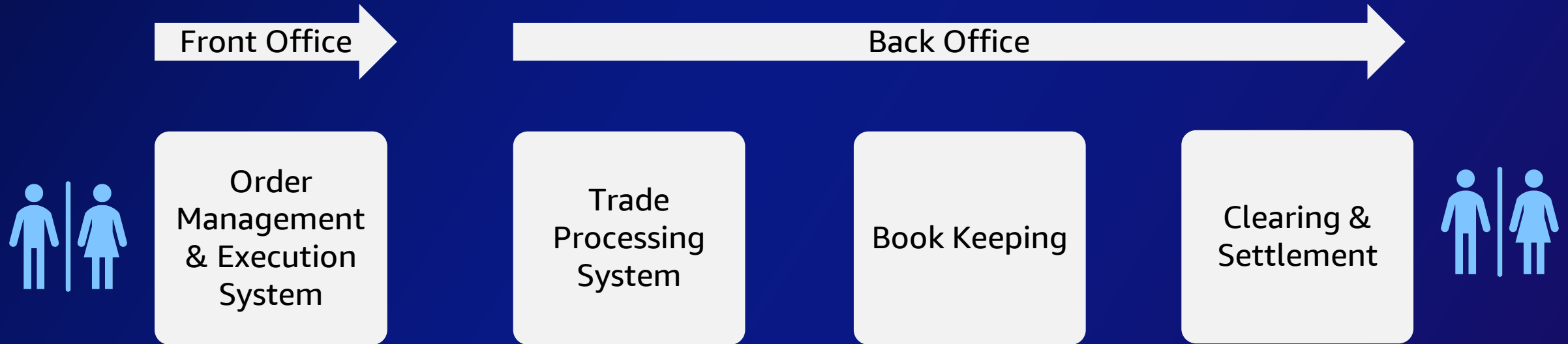
MSSQL > Aurora

.NET Portability Assistant

MSSQL > Aurora



# Trade flow & trade processing system





# Executed order to trade journey

## Trade Processing System

Capture  
Executed  
Order

Enrichment

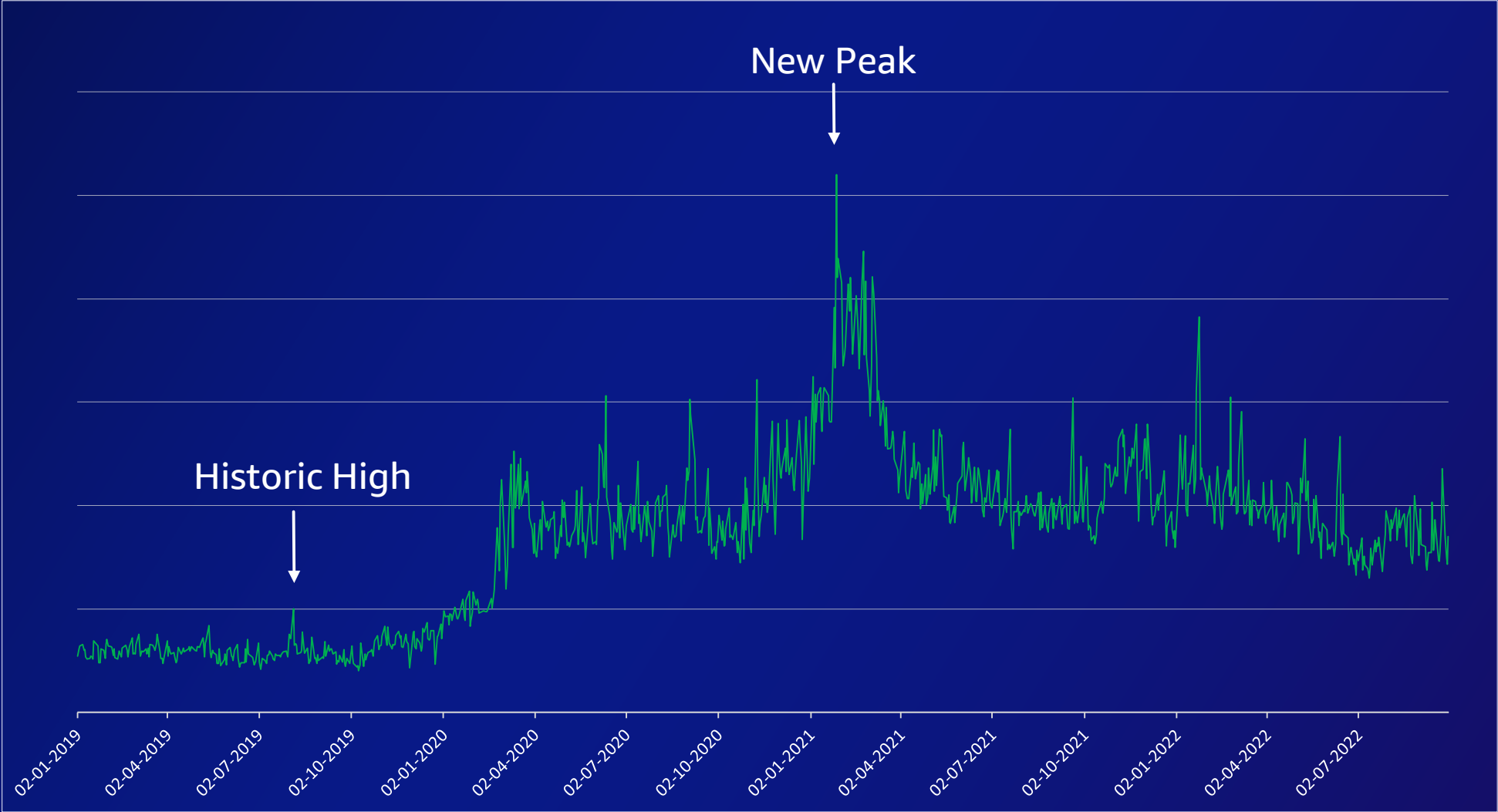
Validation

Commissions,  
fee  
calculation

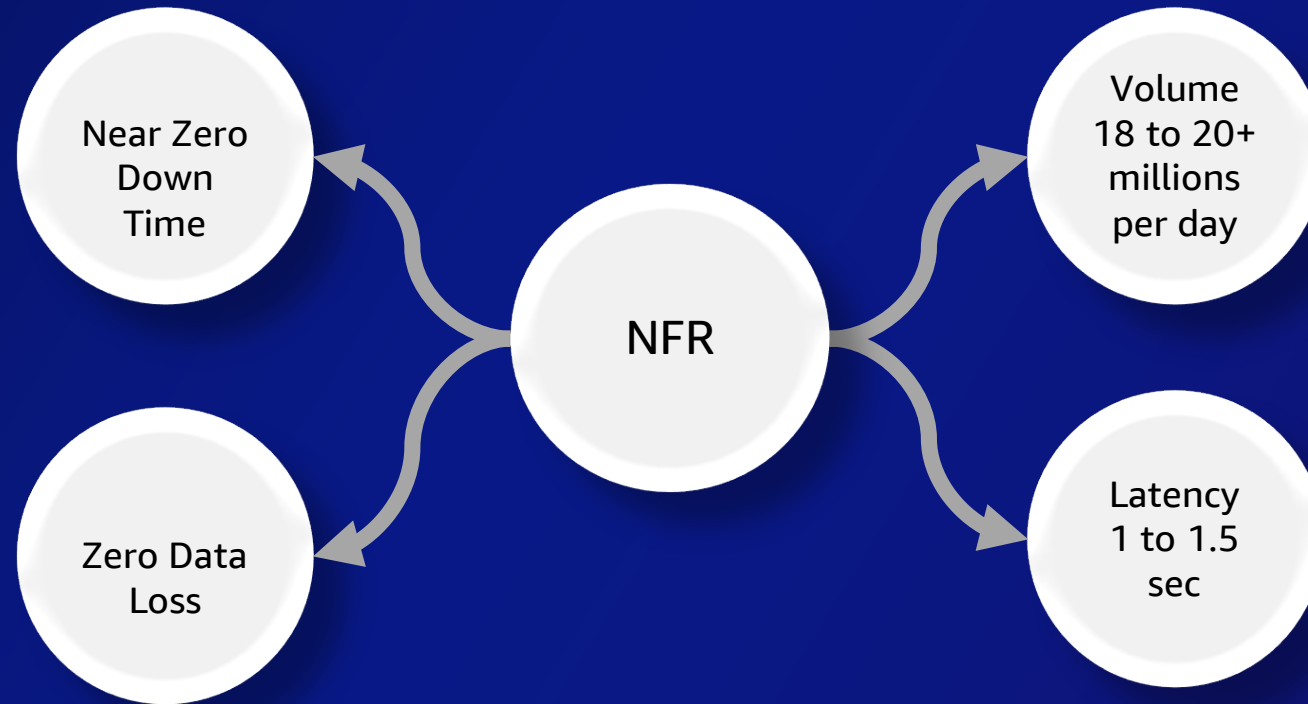
Trade  
Distribution



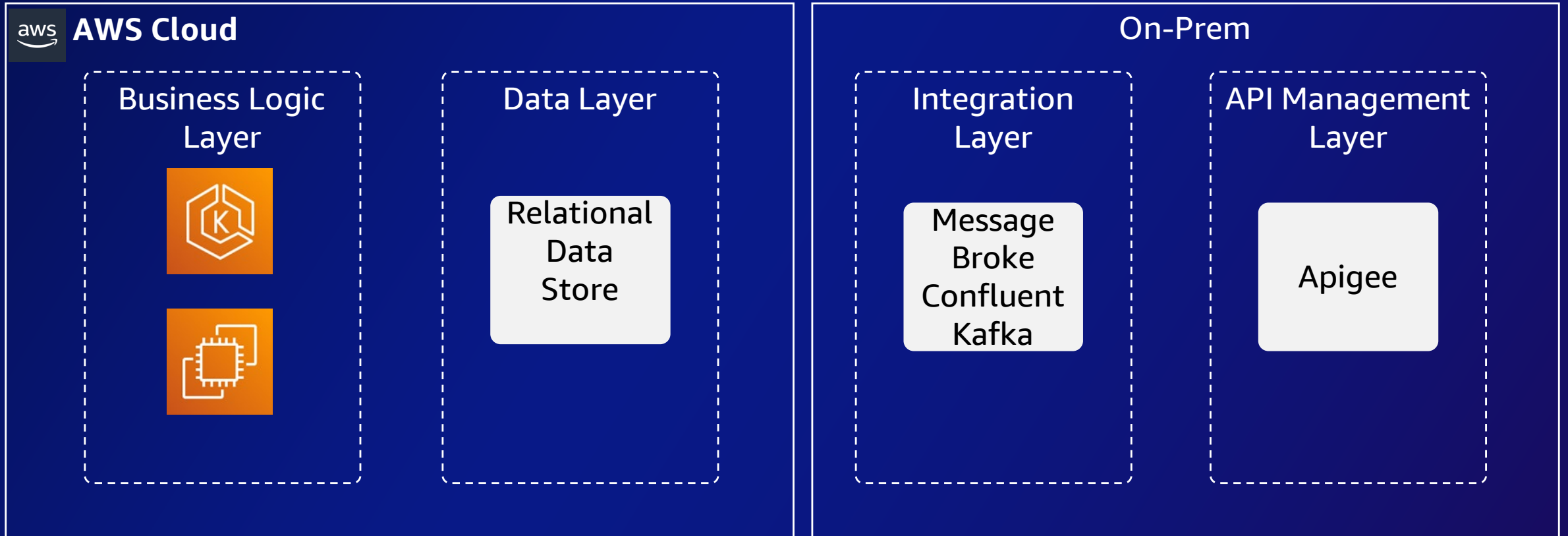
# Fidelity trade processing volume 2019-2022



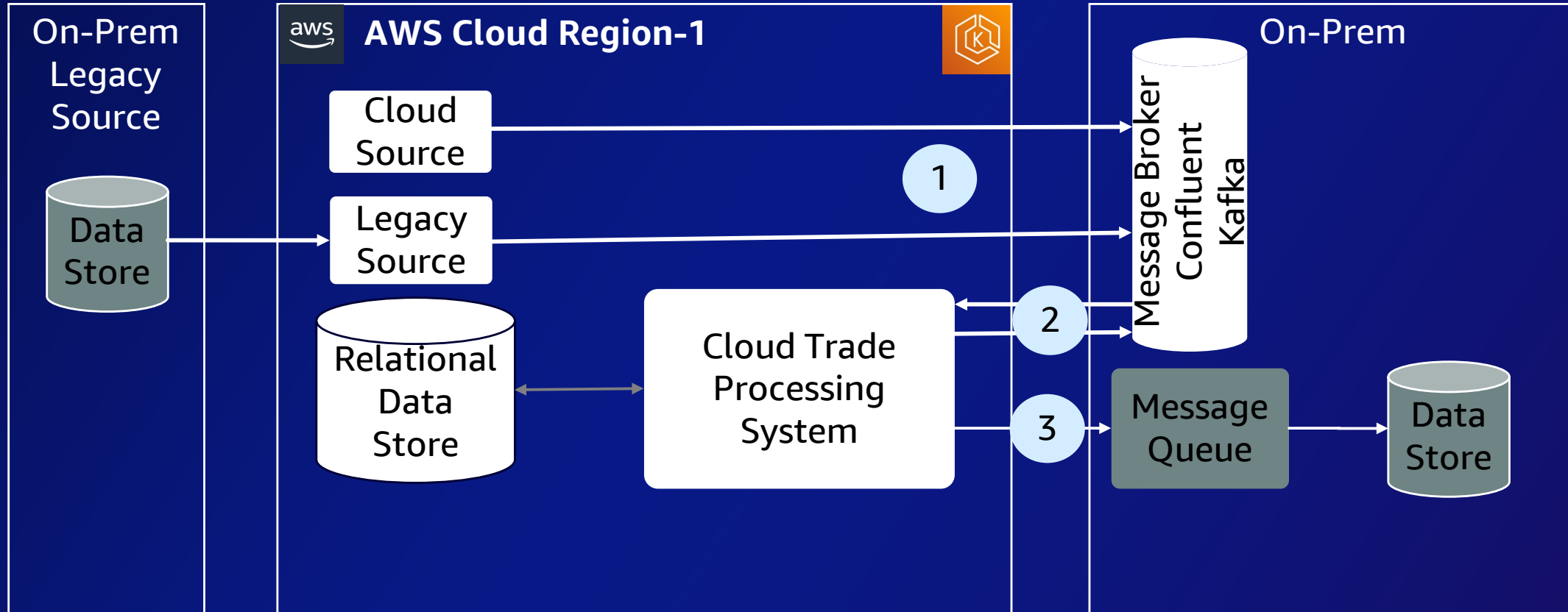
# Trade processing system volume & NFR



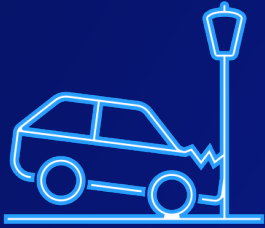
# Trade processing system AWS Ecosystem



# Trade processing system architecture & Design



# Challenges & learnings with Hybrid Cloud



Resiliency



Latency



Downtime & Durability

# Design principles

Co-locate  
sub systems

Systematically  
Detect &  
Trigger  
Failover

Auto Detect  
System  
Health

Auto Region  
Failover

Auto Replay  
Message

# AWS Cloud Ecosystem



## AWS Cloud

### Business Logic Layer

Trade  
Processing  
System



### API Management Layer

Stratum



### Integration Layer

Message  
Broker  
Confluent  
Kafka



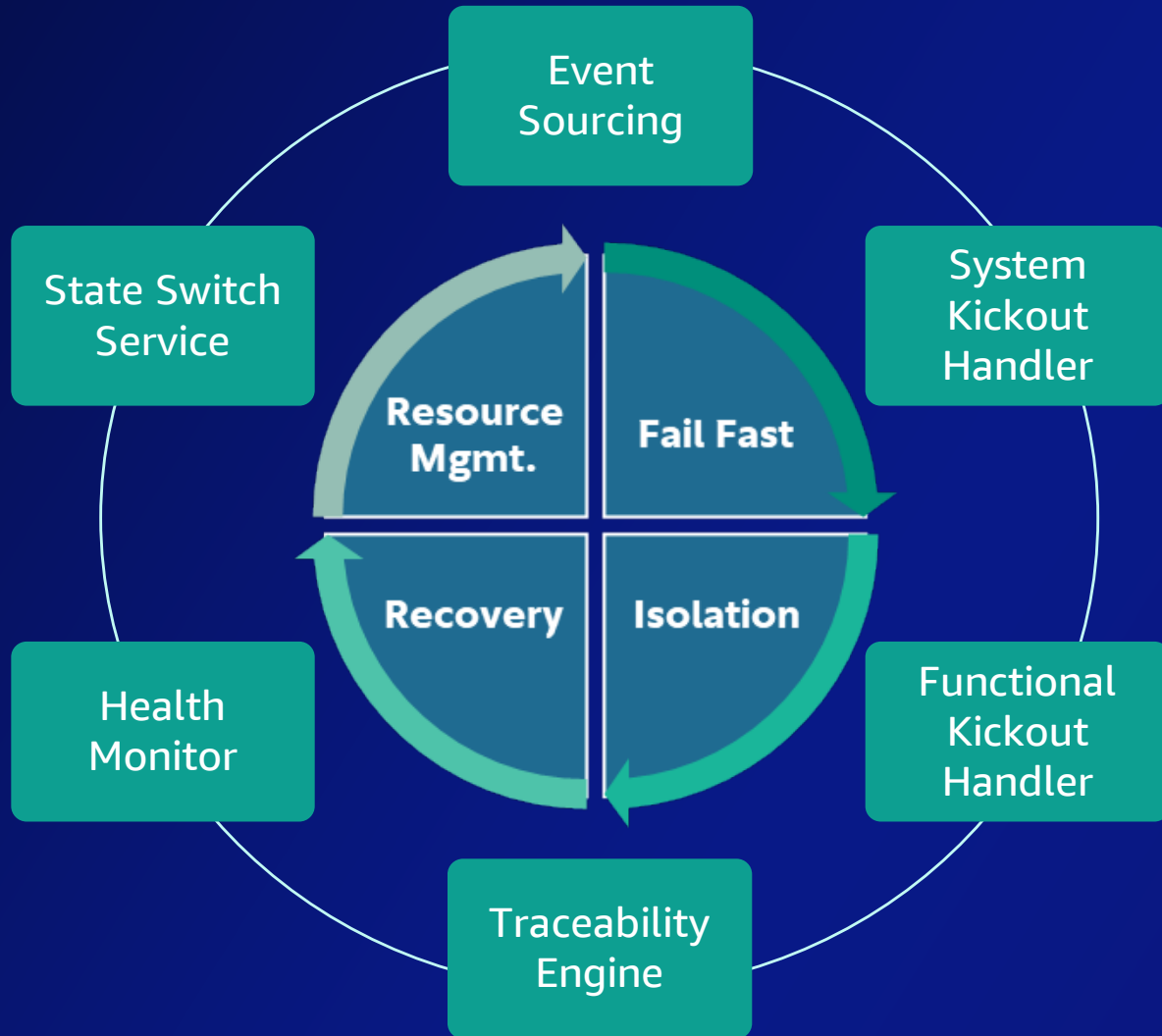
### Data Layer

Relational  
Data  
Store





# Application resiliency approach



**Event Source:** Track messages within the trade processing workload

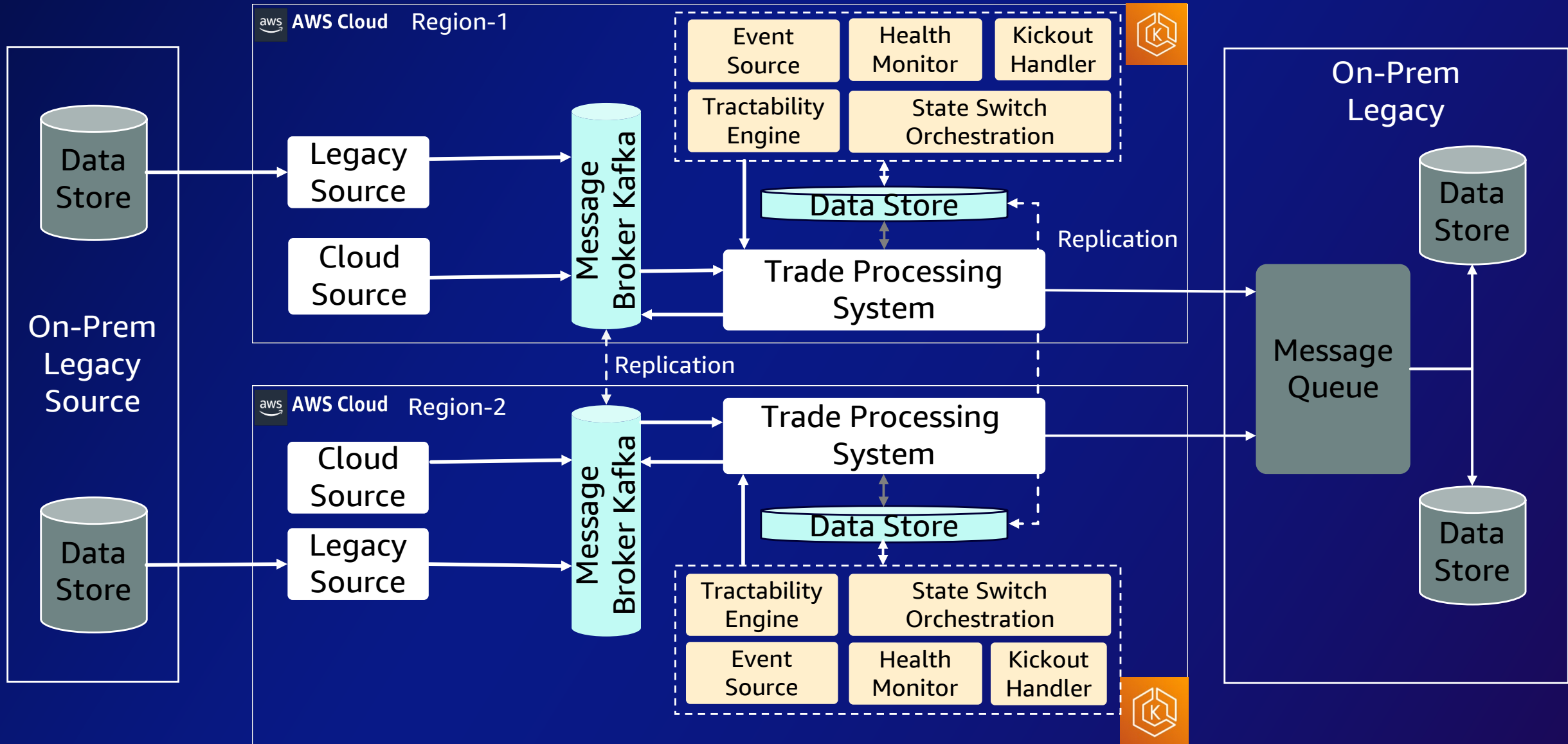
**Kickout Handler:** Capture functional & system errors within trade processing workload

**Traceability Engine:** Monitor the message and replay

**Health Monitor:** Detect the error from all sub-systems within a region and based on threshold trigger failover event

**State Switch Service:** Broadcast failover state to appropriate services across region

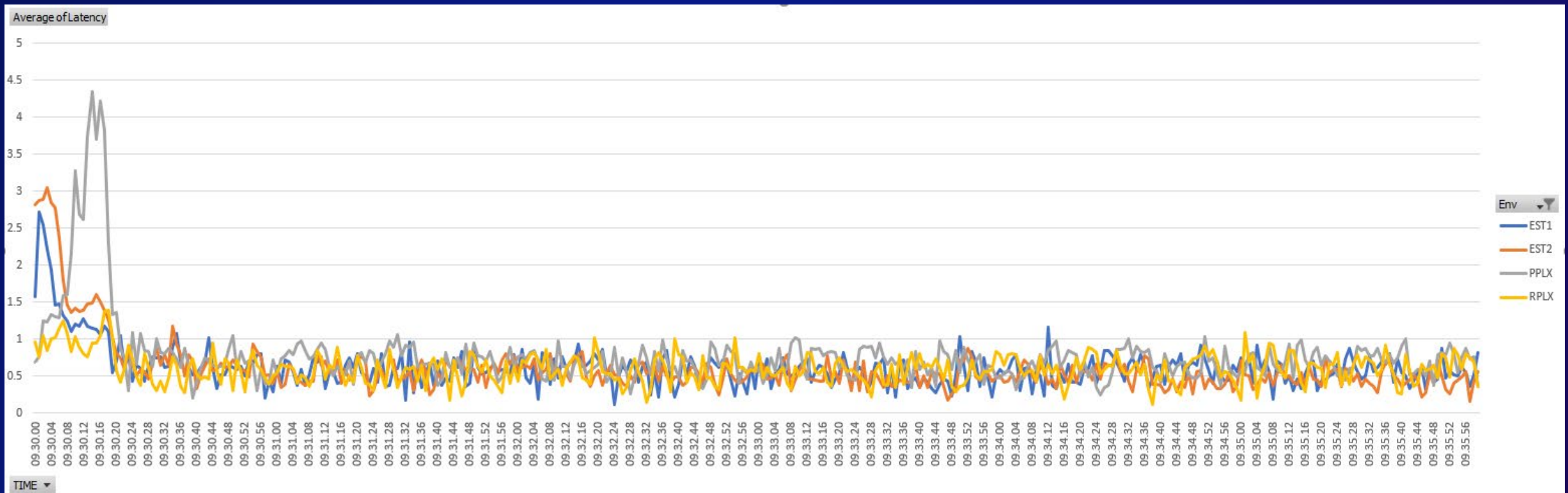
# Hot-hot event driven architecture & design



# Hot-hot architecture & design outcomes

Boost in performance after removing the network chatty-ness

Cloud	Comment
Market Open stats	Nearly 3X improvement
Intraday stats	Nearly 4X improvement



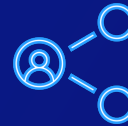
# Fidelity lessons learned



Learn &  
Experiment



New Technology



Share



Contribute

# Fidelity culture



Customer  
First



Innovate



Talent



We are ONE

skillbuilder.aws 

# **Your time is now**

Build in-demand cloud skills *your way*



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# Thank you!

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