LIVING THE CLOUD-AGNOSTIC DREAM

With Event-Driven Architecture

Utrecht JUG – 15th March 2023
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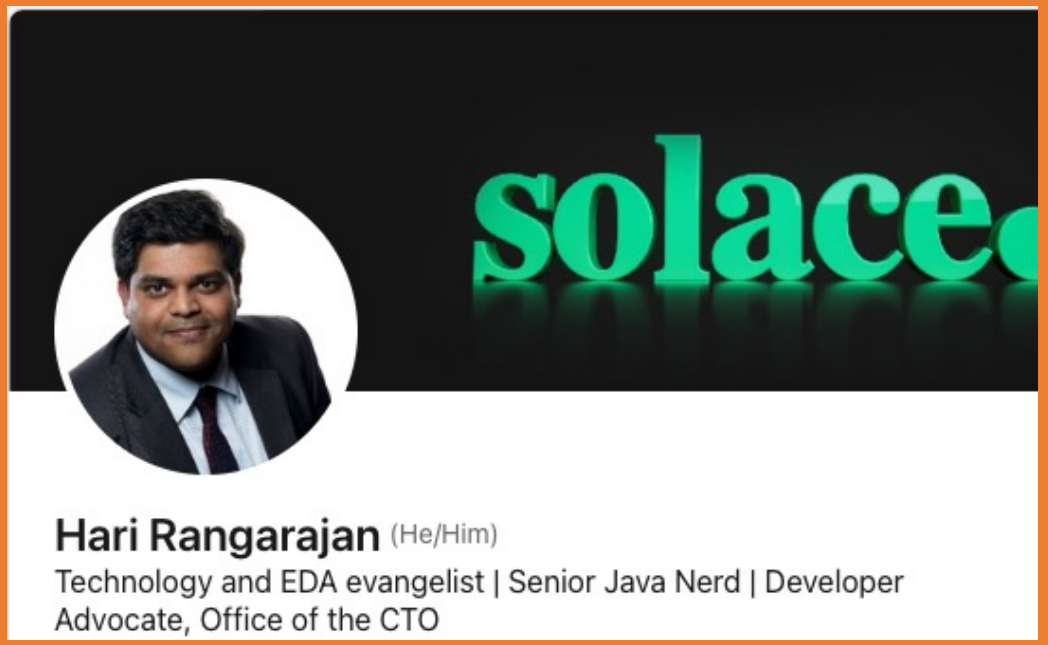
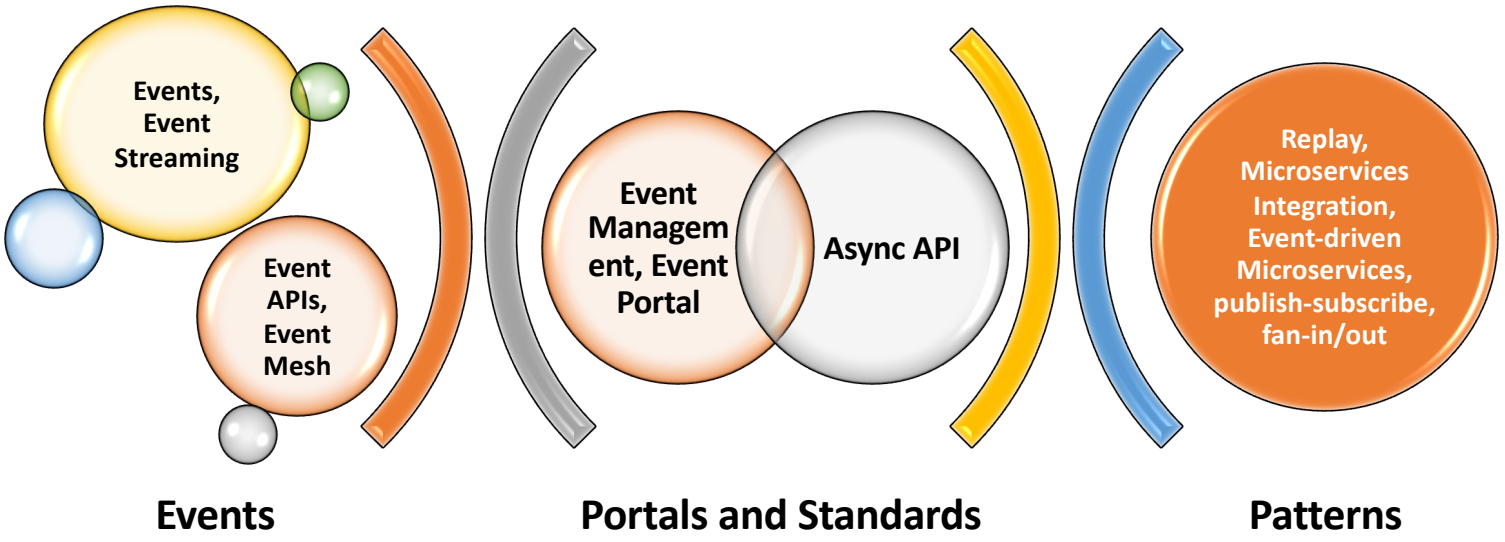
Developer Advocate @ Solace



- Developer Advocate w/ Solace
- Enjoy creating awareness around everything EDA & asynchronous communication
- Love Java and developer at heart

Terms and Trends



Agenda

- Intro to events and EDA
- Why EDA and examples
- Challenges in the EDA journey
- EDA and the cloud
- Cloud agnostic and arbitrage
- Event Mesh
- Real-life use case with an event mesh

What are events ?

SMART SENSORS

CARS

MEDICAL DEVICES

POS

Events are all around us

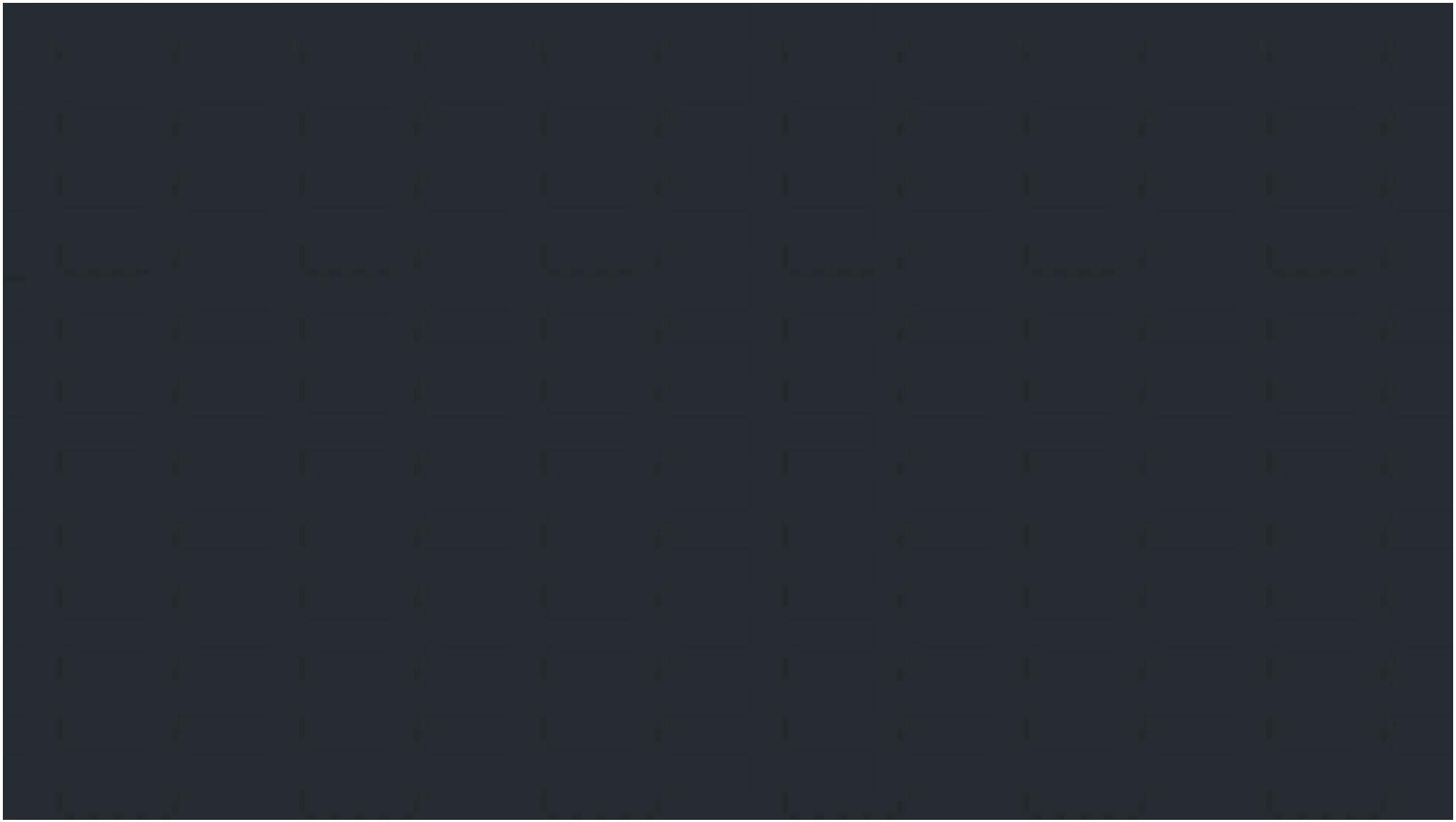
- Events are happening **everywhere**, **all the time**
  - In apps, cars, appliances, servers and even in our brains
- With so many devices online
  - It's becoming easier to collect data from just about anywhere

What is Event-Driven Architecture?!

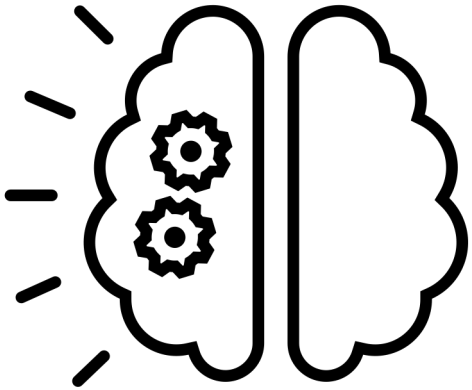
h

what is event driven architecture in short

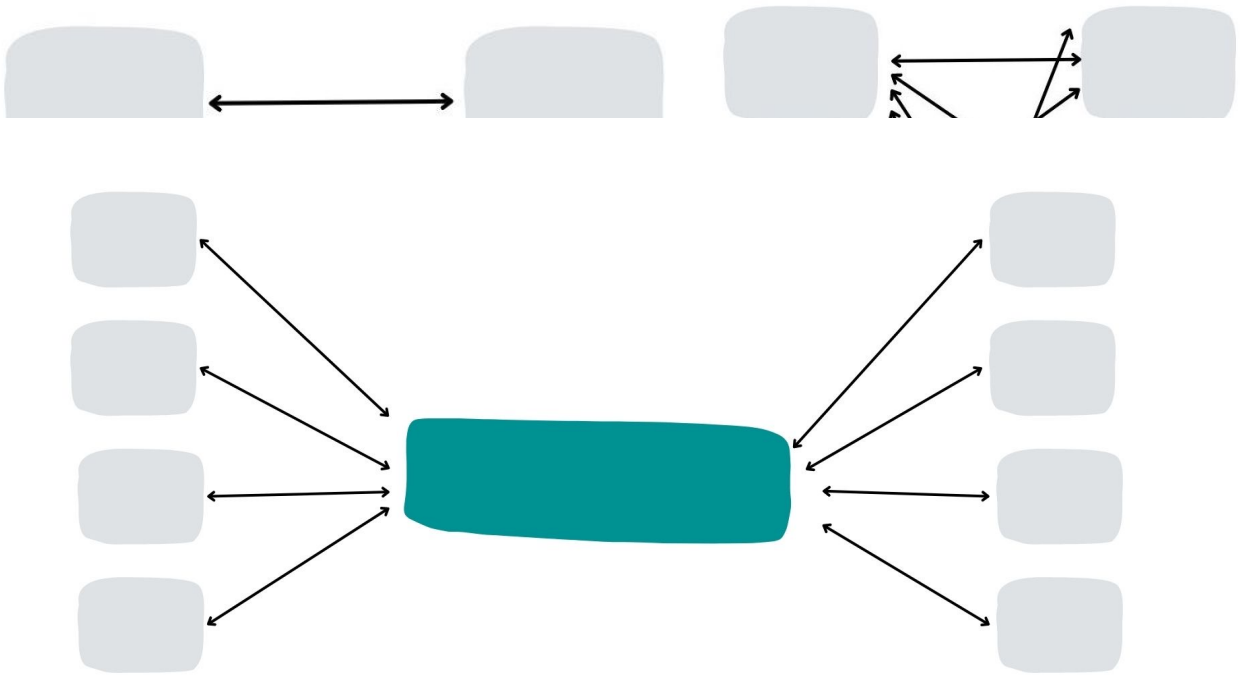
Event-driven architecture (EDA) is a software design pattern where the flow of a system is determined by events, rather than by direct requests from one component to another. In EDA, components interact by producing and consuming events, with a central hub (such as a message broker or event bus) for distributing events to interested consumers. This pattern allows for loose coupling between components, enabling easier maintenance and extension of the system, and provides a clear and consistent way to model changes in the system's state.

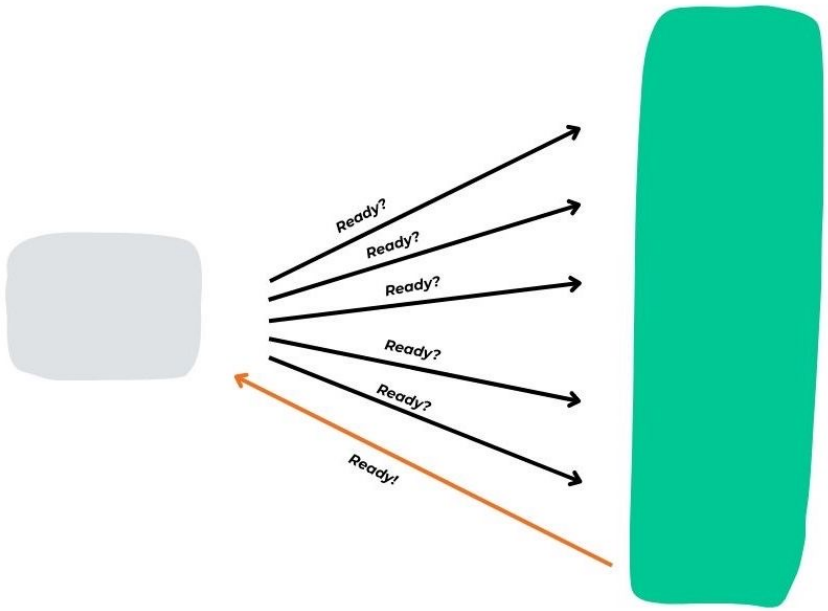


Why Event-Driven Architecture (EDA)!?



Decoupling

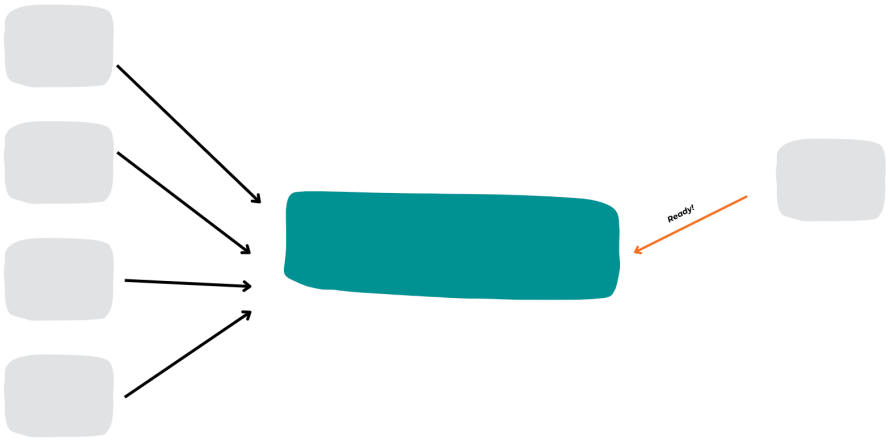



Ready?
Ready?
Ready?
Ready?
Ready?
Ready!

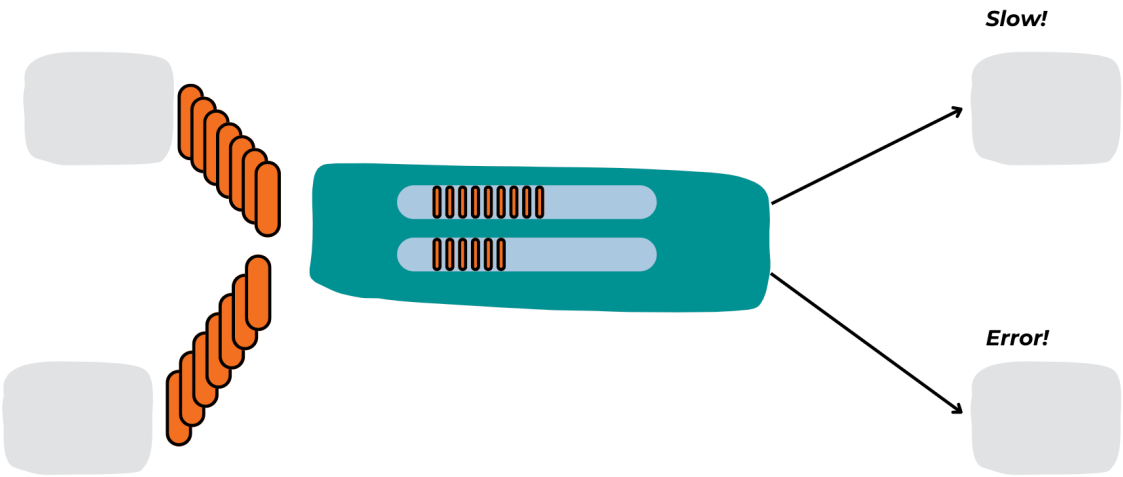
Reactive


Subscribe to topic Ready
Publish on topic Ready

Scaling



Resiliency



Let us bust few myths around EDA

I will have to re-design my REST-heavy architecture from scratch to adopt EDA

APIs are only asynchronous in EDA

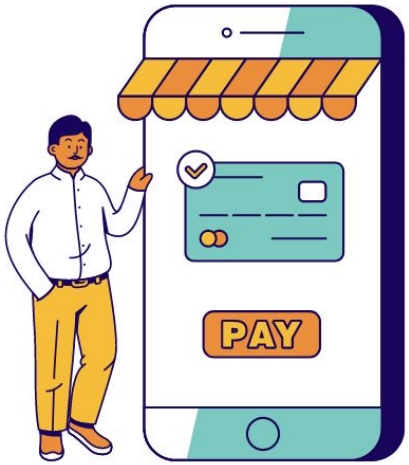
EDA is for high throughput use cases only

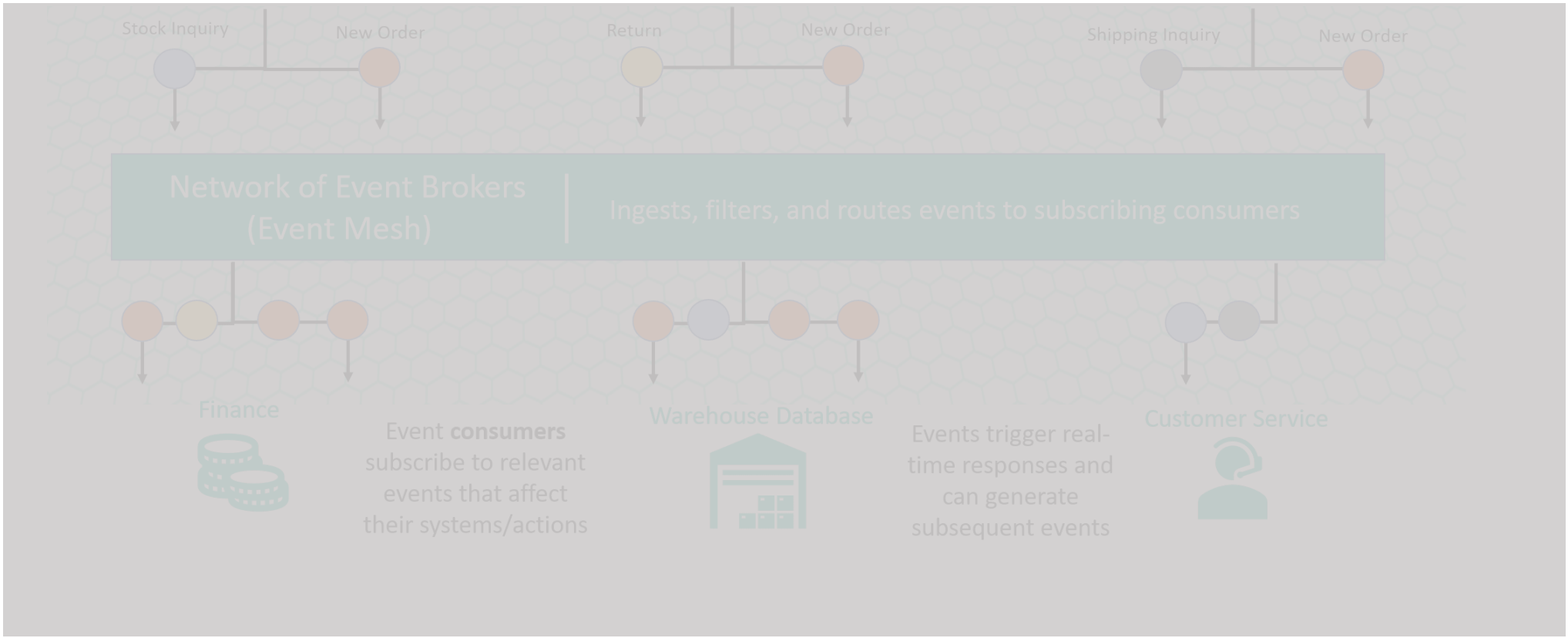
EDA can prevent cascading failures in a microservices architecture

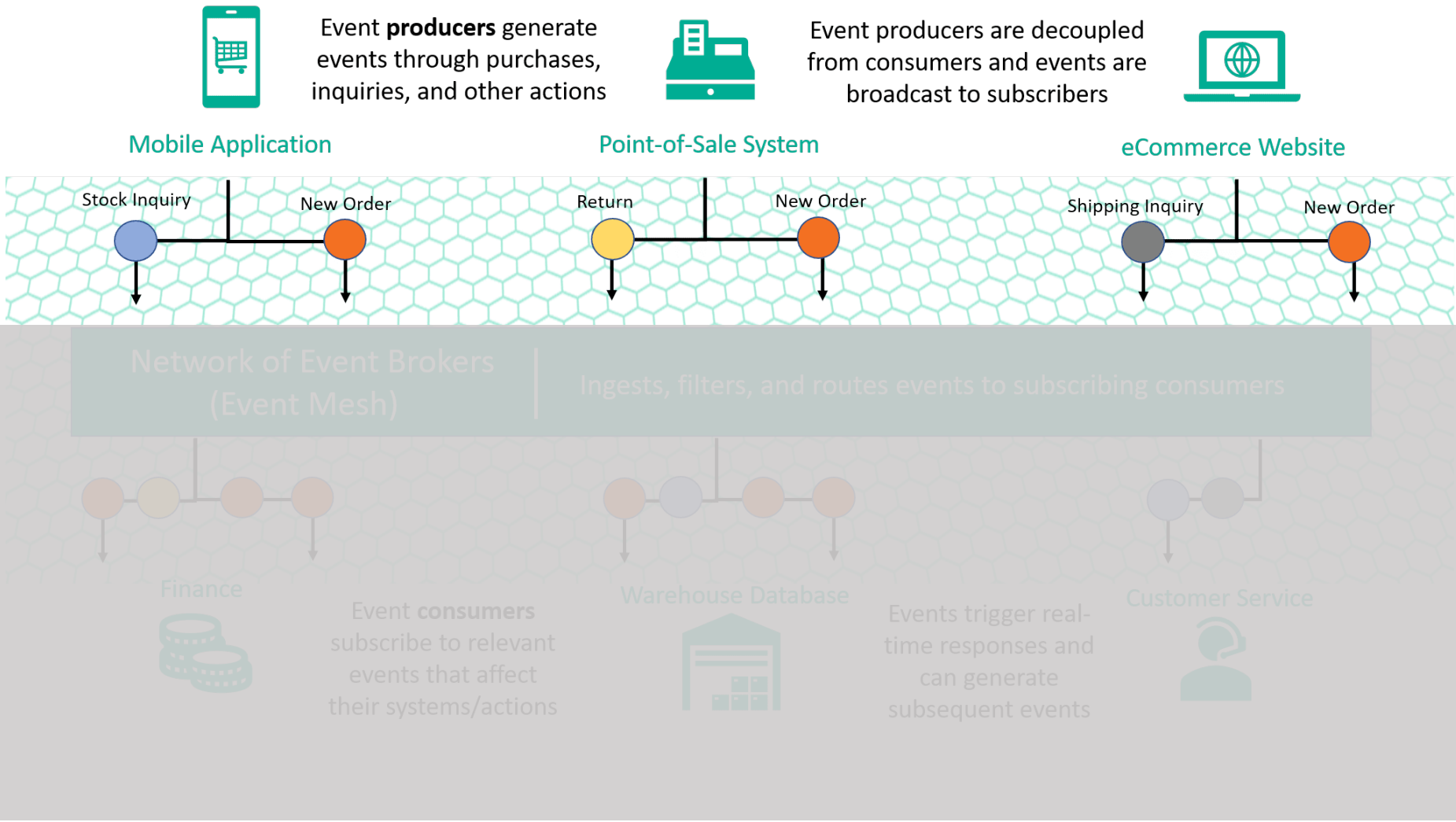
Event streaming are only implemented using Apache Kafka

GIVE ME AN EXAMPLE!

Retail use-case




Event **producers** generate events through purchases, inquiries, and other actions
Event producers are decoupled from consumers and events are broadcast to subscribers
Mobile Application
Point-of-Sale System
eCommerce Website
Stock Inquiry
New Order
Return
New Order
Shipping Inquiry
New Order
Network of Event Brokers (Event Mesh)
Ingests, filters, and routes events to subscribing consumers
Finance
Warehouse Database
Customer Service
Event **consumers** subscribe to relevant events that affect their systems/actions
Events trigger real-time responses and can generate subsequent events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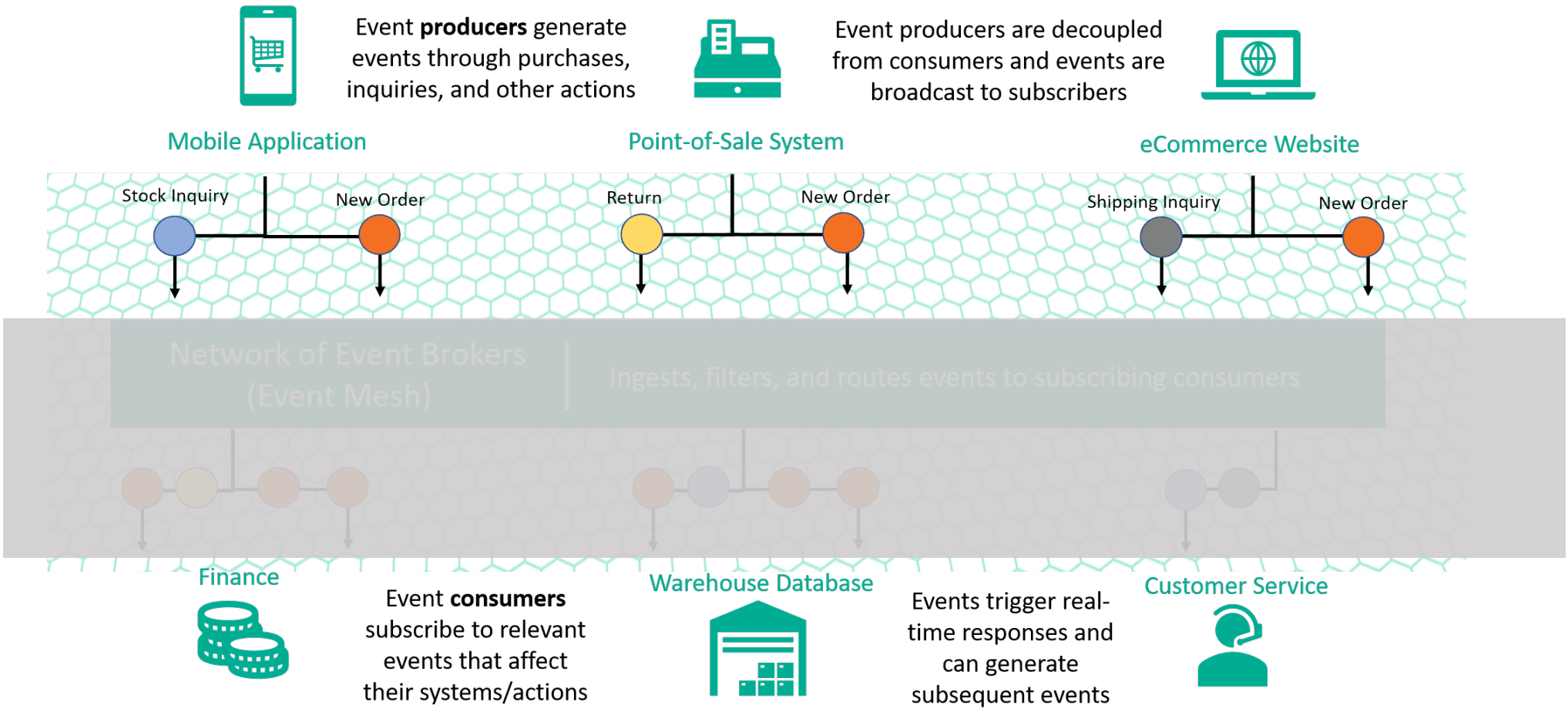
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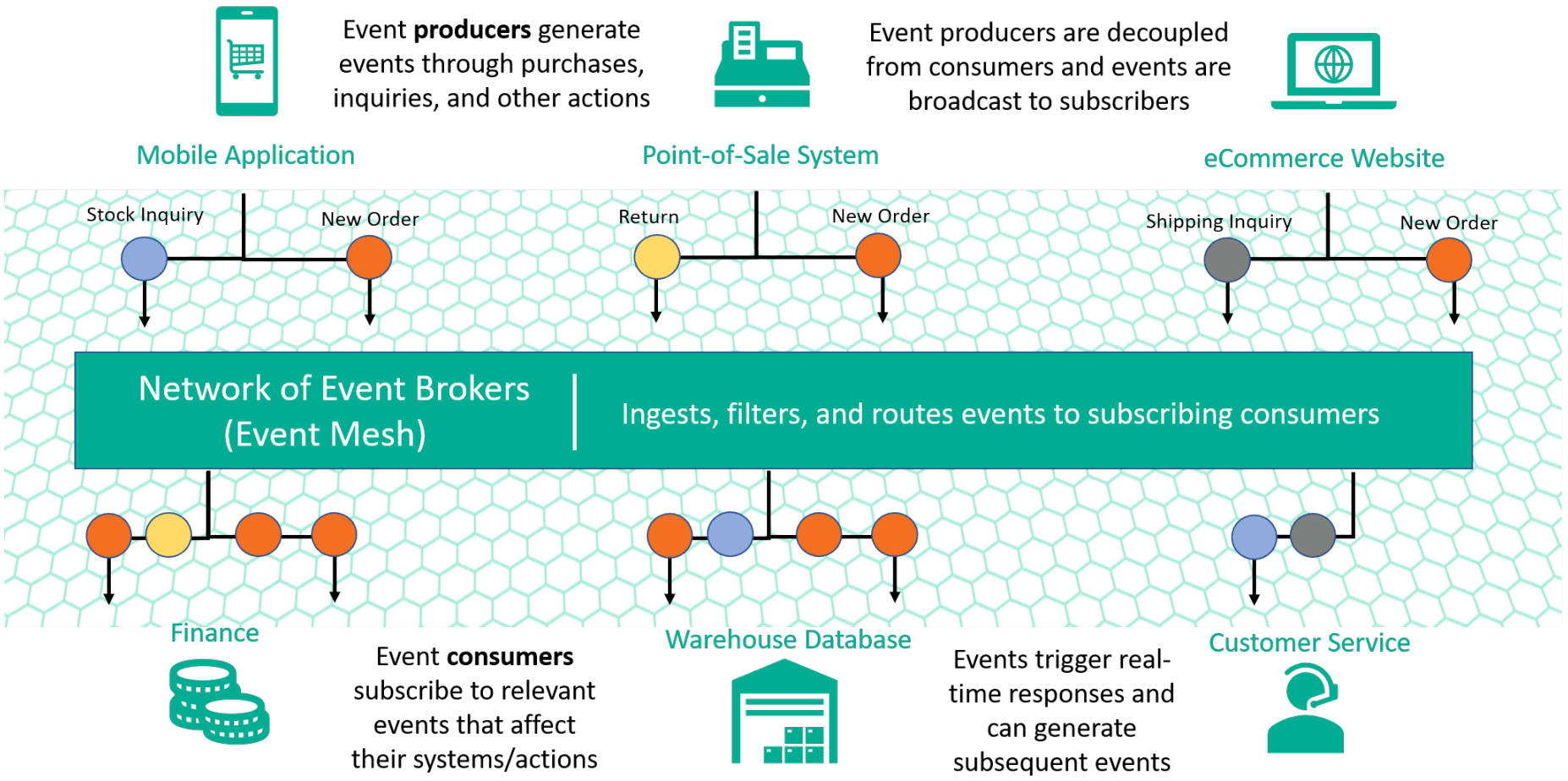
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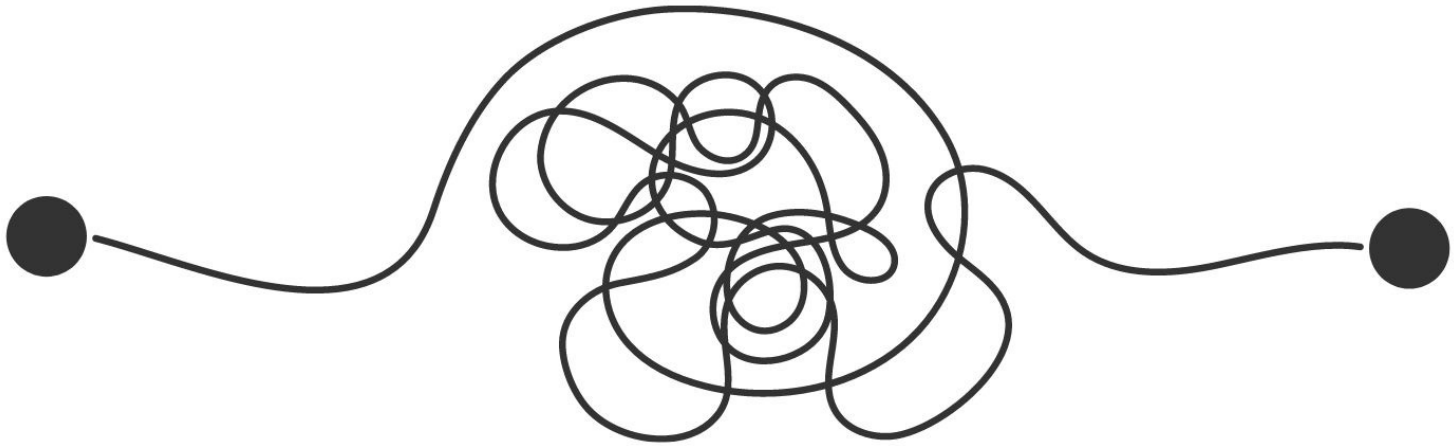
EDA IS NOT EASY!

What are the challenges involved with EDA?




Knowledge & Skills
Buy-in
Topology Visualization
Event Discovery
Collaboration
Documentation, Specifications, and Standardization
Availability of Tooling
Environments
Versions Management
Distributed Environments (Multi Cloud, On-Prem, Hybrid)
Replicating across multiple flavors of EDA implementation
Translation and Interoperability (Languages, Protocols, and Standards)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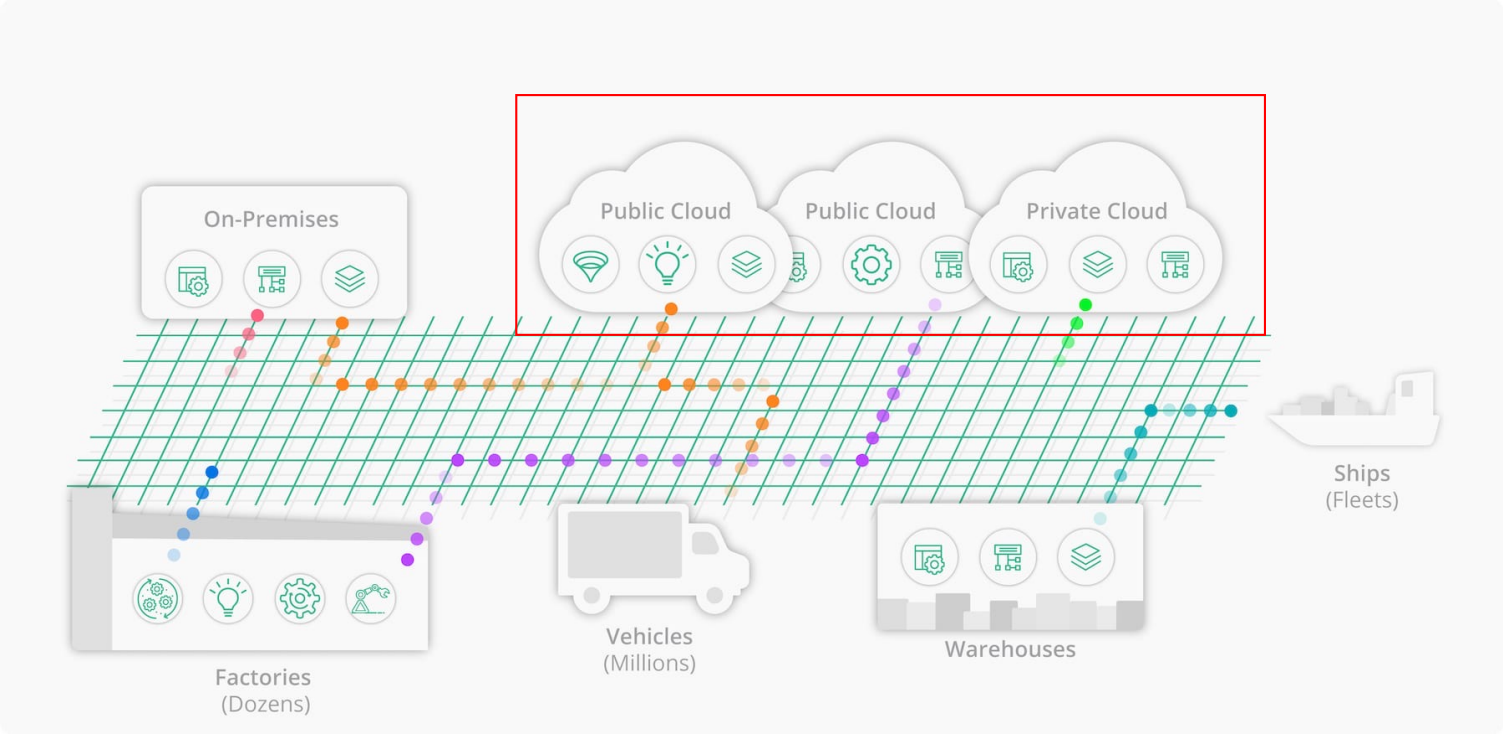
Imagine a world where...



Events move freely between on-premise and cloud services

Public and Private clouds

Legacy and new silos

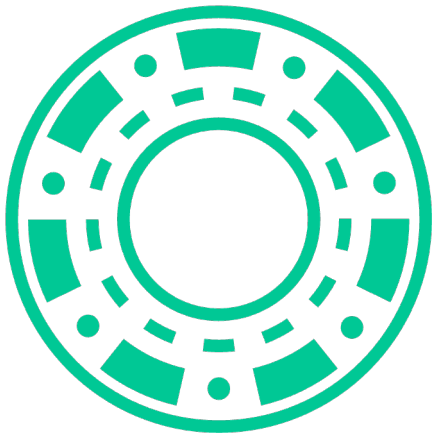
IoT and microservices

Using different messaging protocols

Using different programming languages

Why use cloud services with EDA?

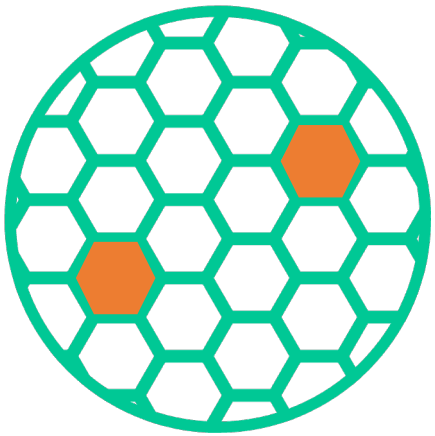
Reasons to adopt cloud services...



Using Cloud provided services (e.g. ML, NLP…etc)

Offloading compute resources

System scalability



Be closer to data sources and sink

Why Cloud Agnostic tho?

Can't we get all these benefits with one cloud provider?

Reasons to adopt a cloud agnostic solution...

Hybrid deployment

Avoid vendor lock-in and practice cloud arbitrage*

Political and customer requirement restrictions

Geographical restrictions

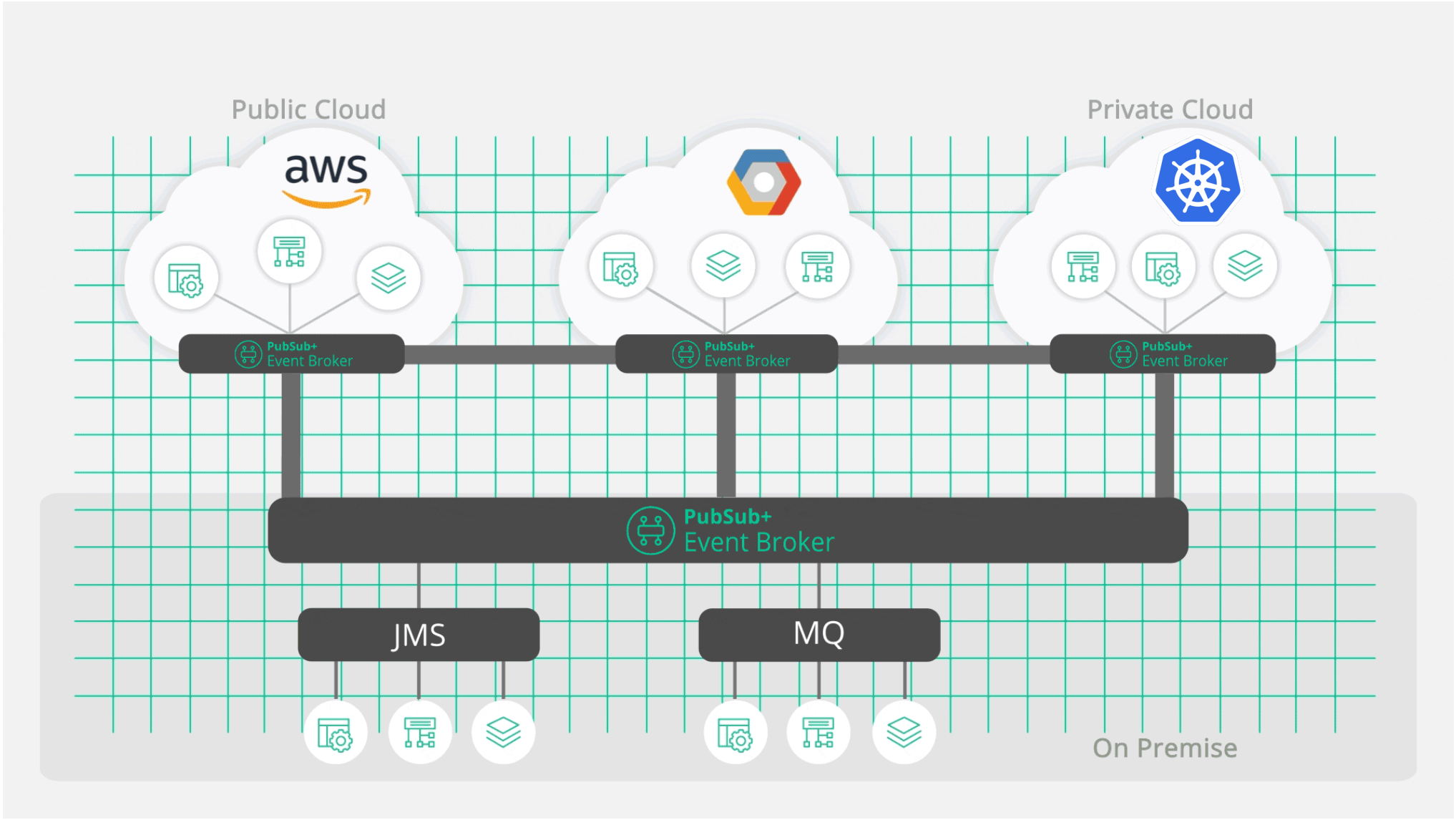
A note on Cloud Arbitrage...

- ✓ The process of comparing multiple cloud vendors against performance, pricing and overall capabilities
- ✓ Then move the workload to platforms that best meets the needs
- ✓ Save $$$
- ✓ How can you do workload migration?
- ✓ What are the available tools in EDA that are cloud agnostic?
- ✓ How can data movement be cloud agnostic?

Okay I understand...

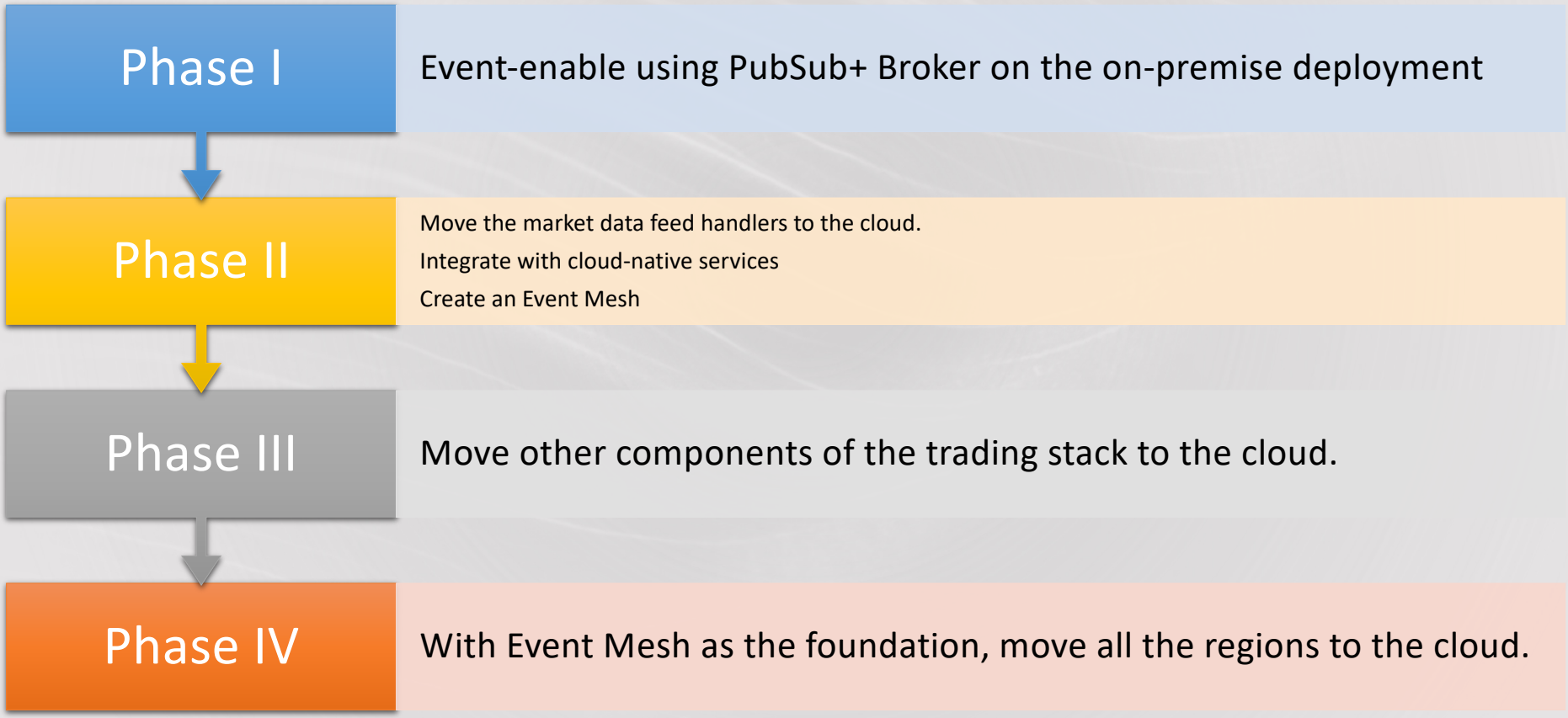
How can I adopt a Cloud Agnostic implementation with EDA?


Event Mesh
Cloud Agnostic
A Modern Love Story


Public Cloud
aws
Private Cloud
PubSub+
Event Broker
PubSub+
Event Broker
PubSub+
Event Broker
PubSub+
Event Broker
JMS
MQ
On Premise

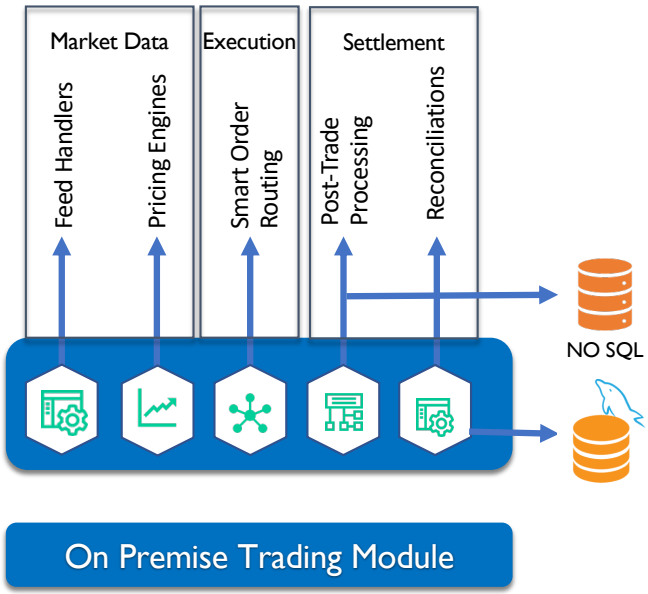
Use Case – Move to Cloud

An investment bank with a trading stack deployed in an on-premise setup looking to move to the cloud and connect US, CANADA, and APAC regions

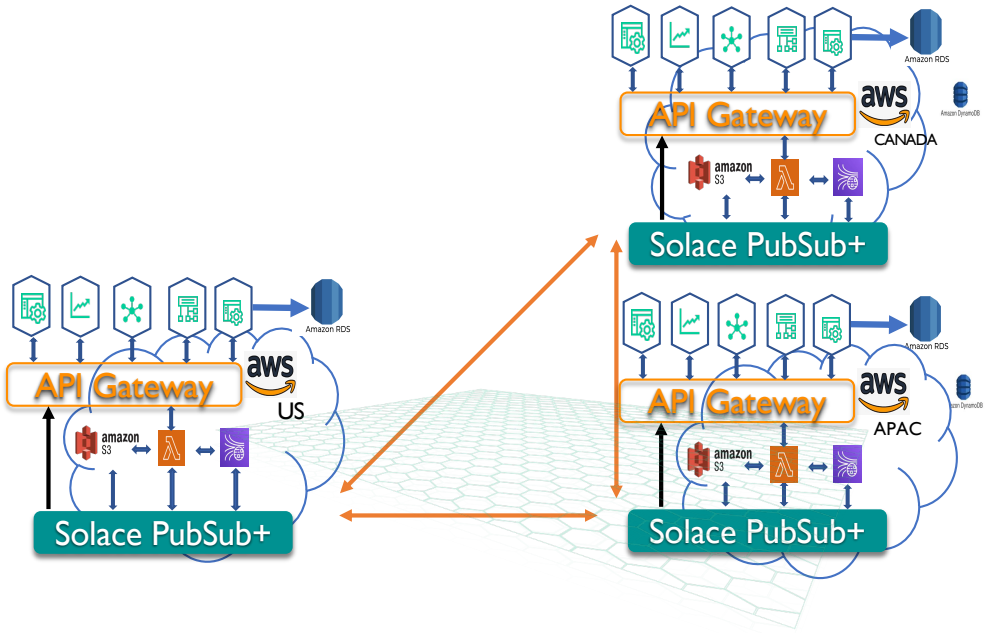


Move to AWS Cloud

Current State



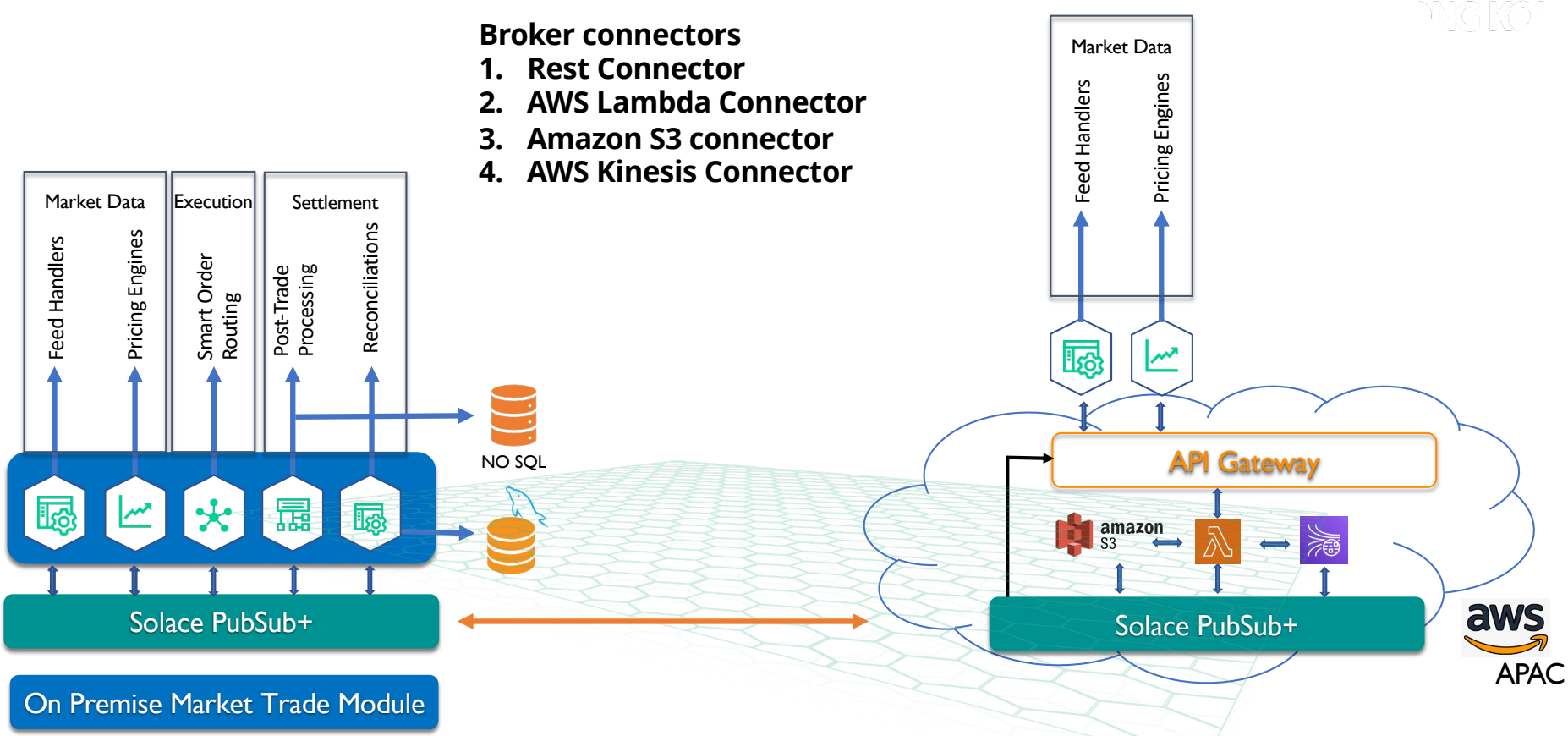
Target State



Create an Event Mesh & Replicate Services on Cloud

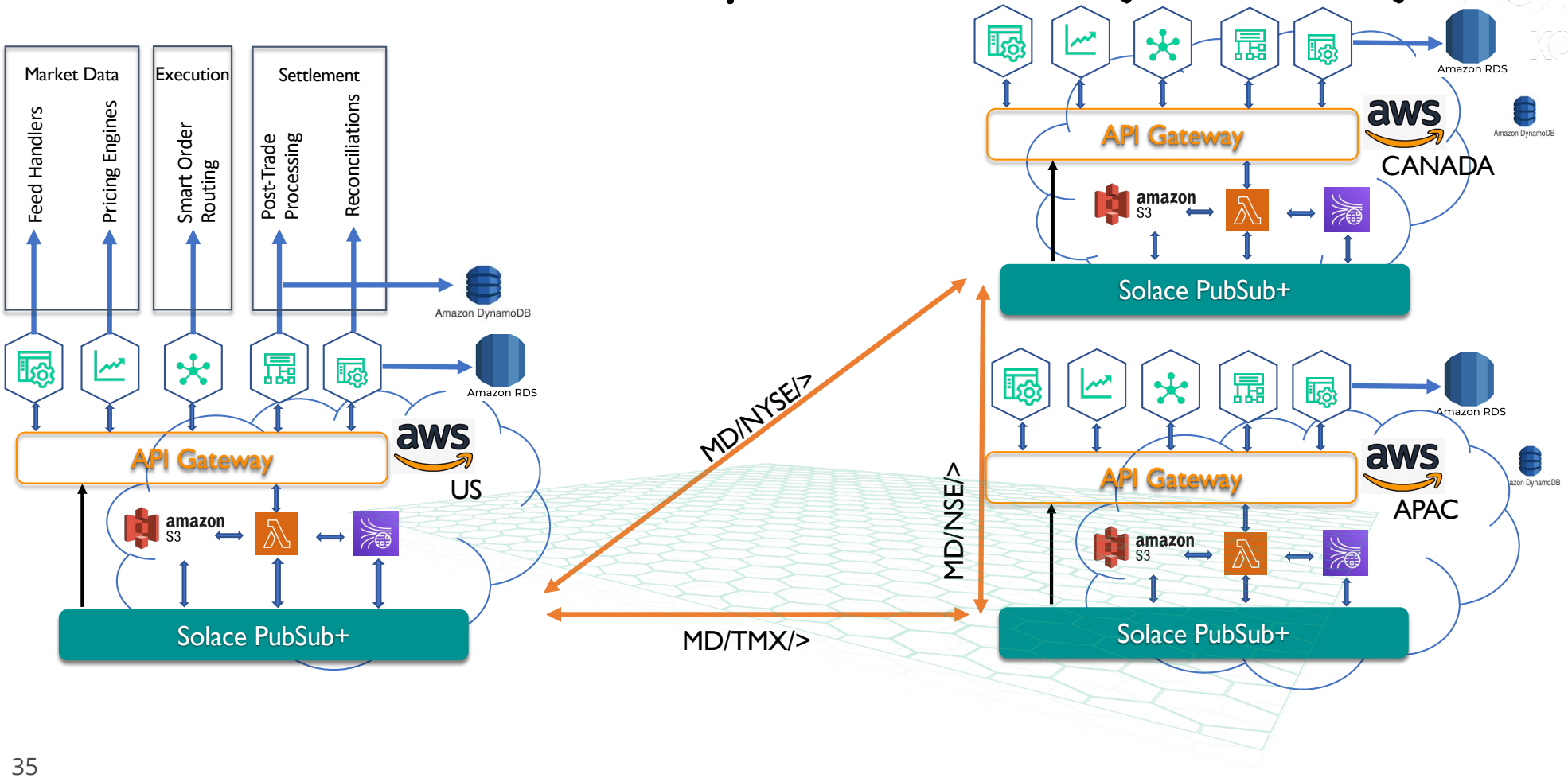
Broker connectors

1. **Rest Connector**
2. **AWS Lambda Connector**
3. **Amazon S3 connector**
4. **AWS Kinesis Connector**



Pilot / Select existing services *or* a few new services on the AWS Cloud

Event Mesh w/ Dynamic Message Routing




PRESENTATION HAS ENDED
THANK YOU