Introduction to leveraging Azure Event Hubs from Apache Kafka

Presented by Nikolai Blackie @Adaptiv

CIBC
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About Nikolai

- Co-founder and Principal Architect @ Adaptiv Integration
- Partners with Dell Boomi, Microsoft and MuleSoft
- Hobbies: ~~Cycling~~, Classic Cars, ~~Rick & Morty~~!!!
- http://www.adaptiv.co.nz/team-member/nikolai-blackie/
- https://twitter.com/nikolaiblackie/
- https://www.linkedin.com/in/nikolaiblackie/

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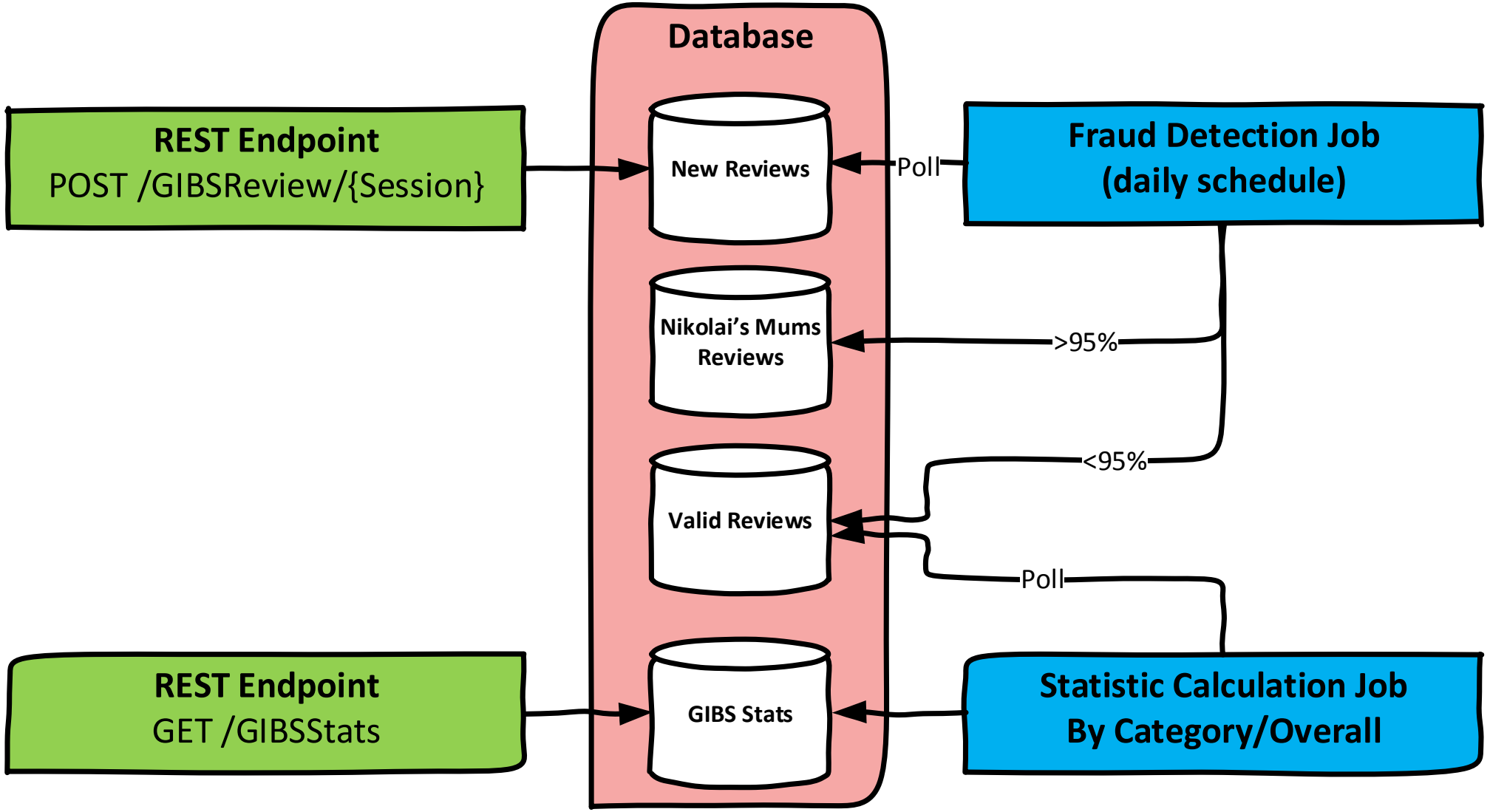
Legacy Application Architecture



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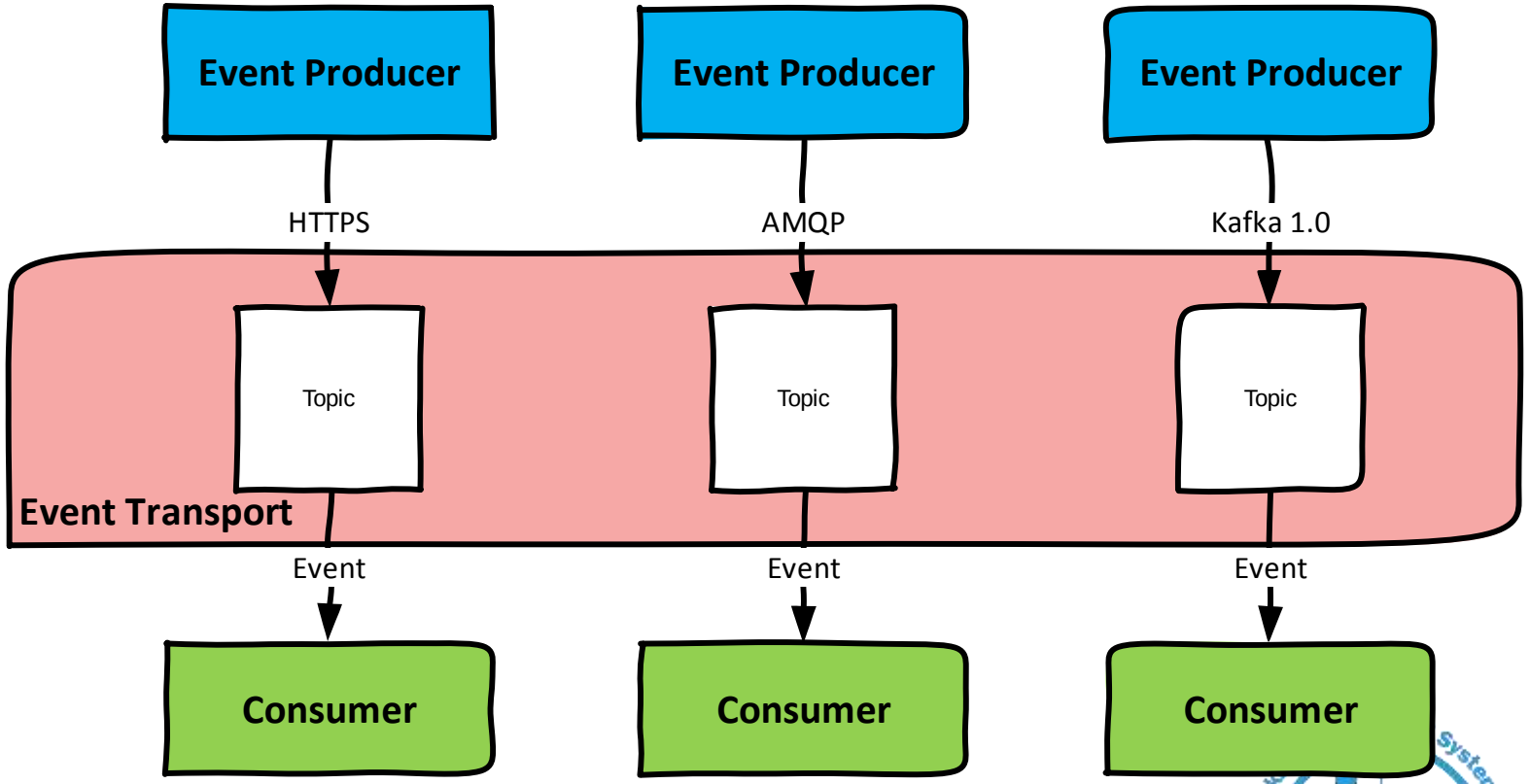
Event-Driven Architectures

- “Events” refer to things that happen in the systems
- They often do not carry much data with it
- EDA promotes the detection, consumption of, and reaction to events, rather than actions



Is Not Life Simply a Series of Events?

Message driven vs. Event Driven

Its level of abstraction - messages are a technical artifact but events relate to a business occurrence.

A traditional ESB tends to use "nouns" as its messages, whereas event-driven architectures are more around "verbs", if that makes sense.

It's not really well defined anywhere that I've seen; no industry consensus yet.

Other than "messages are old, events are new, pay us a bunch of money"

Philip Durant - [21/3/19 5:23 PM]

Four Patterns of EDA

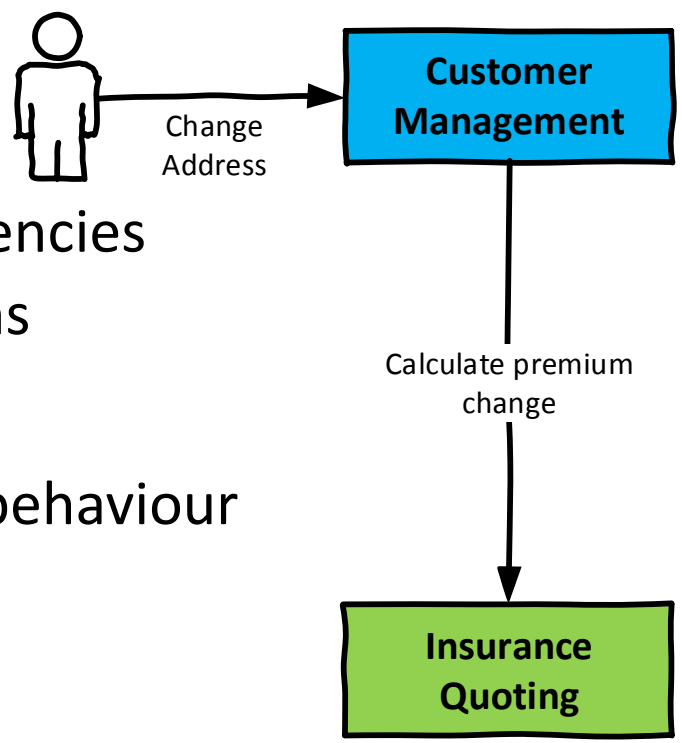
What do you mean by "Event-Driven"?

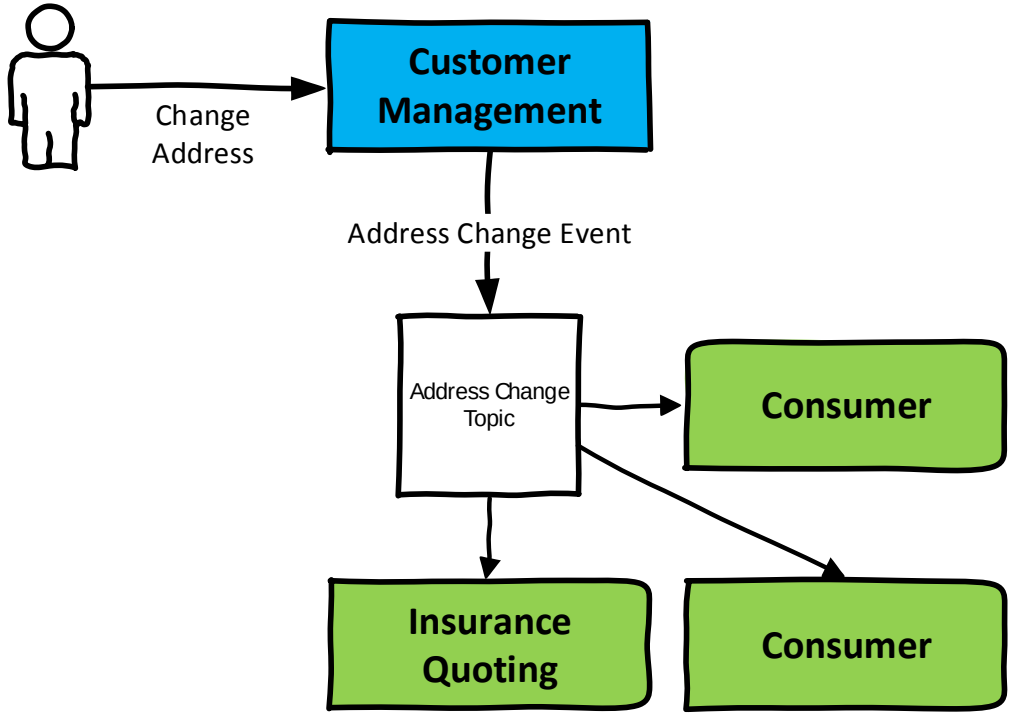
Martin Fowler

07 February 2017

Event Notification System

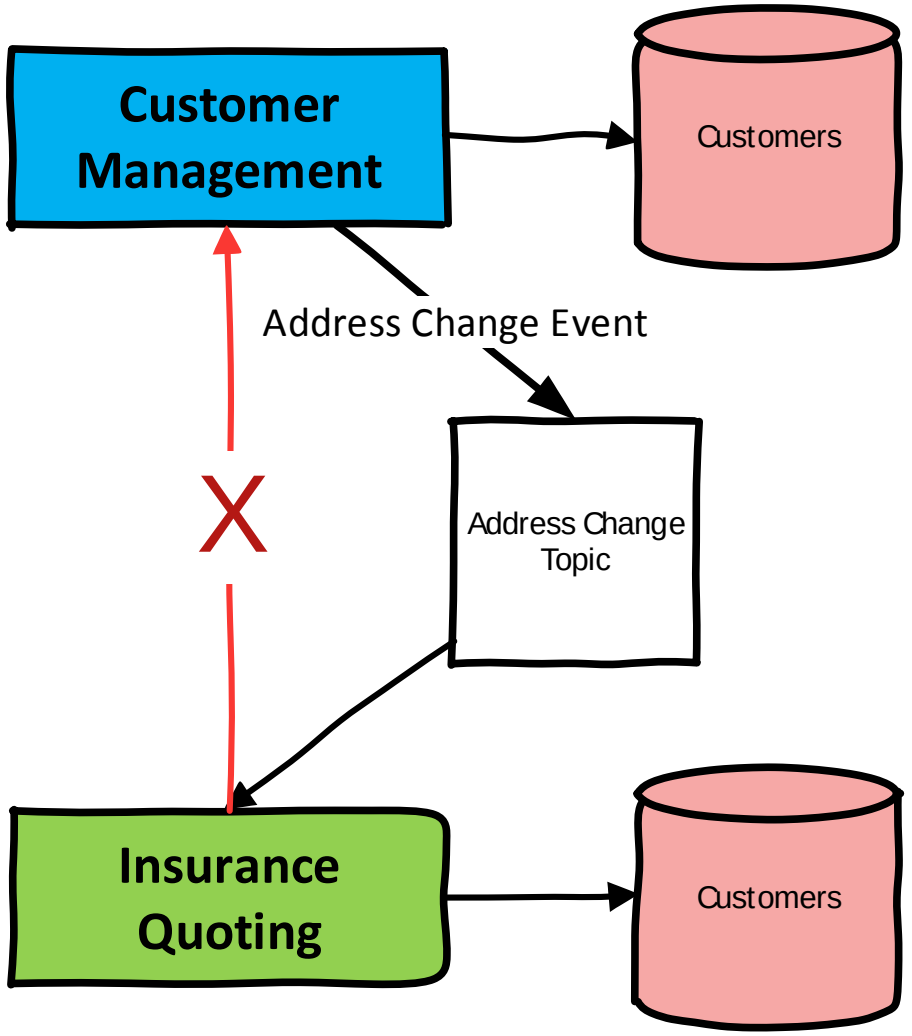
- Pros
  - Reverses dependencies
  - Decouples systems
- Cons
  - No statement of behaviour
  - Difficult to debug





Event Carried State Transfer

- Pros
  - Decoupling
  - Resilient to downstream systems fails
  - Reducing load
- Cons
  - Duplicate copy of event data
  - Eventual Consistency



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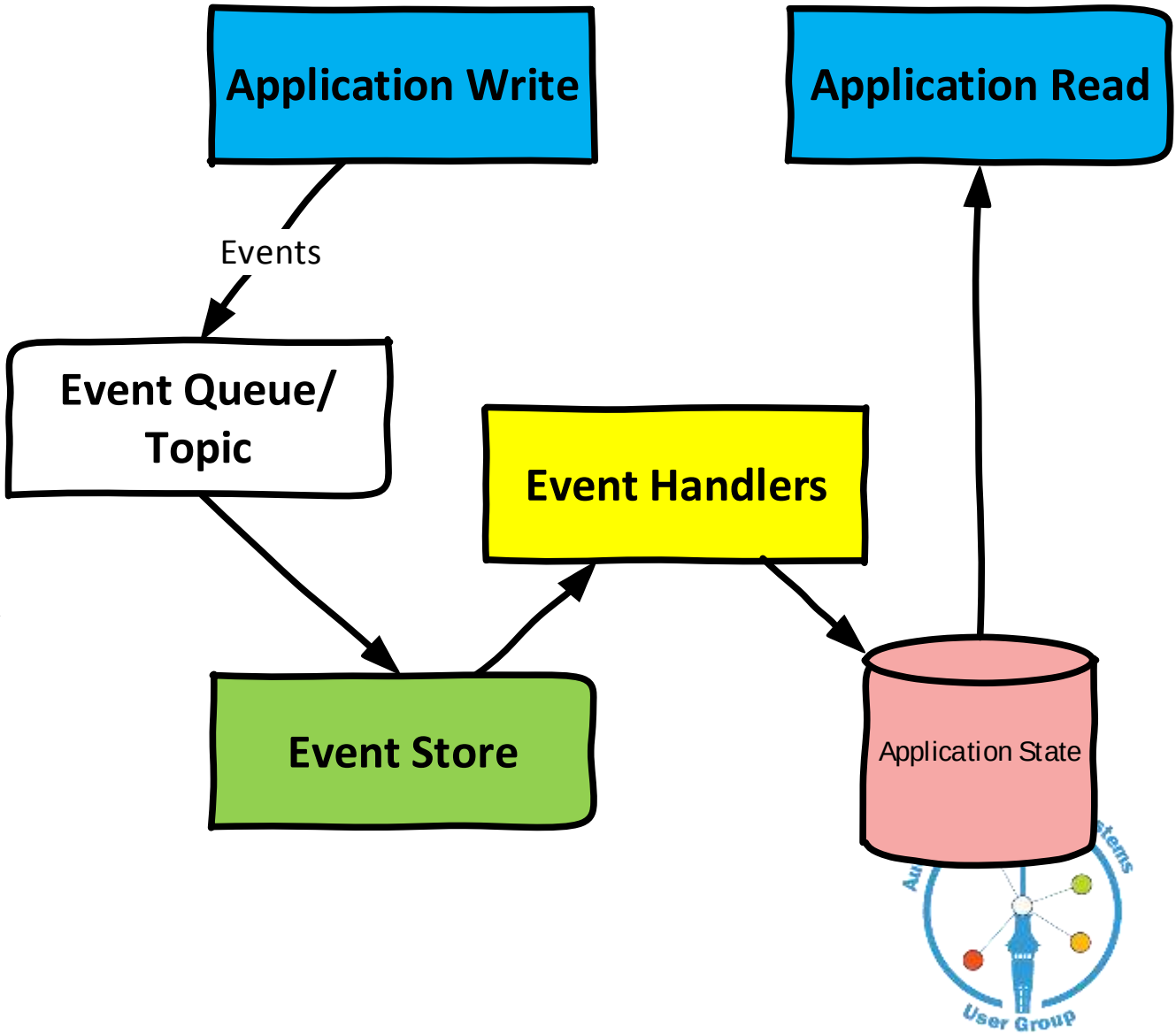
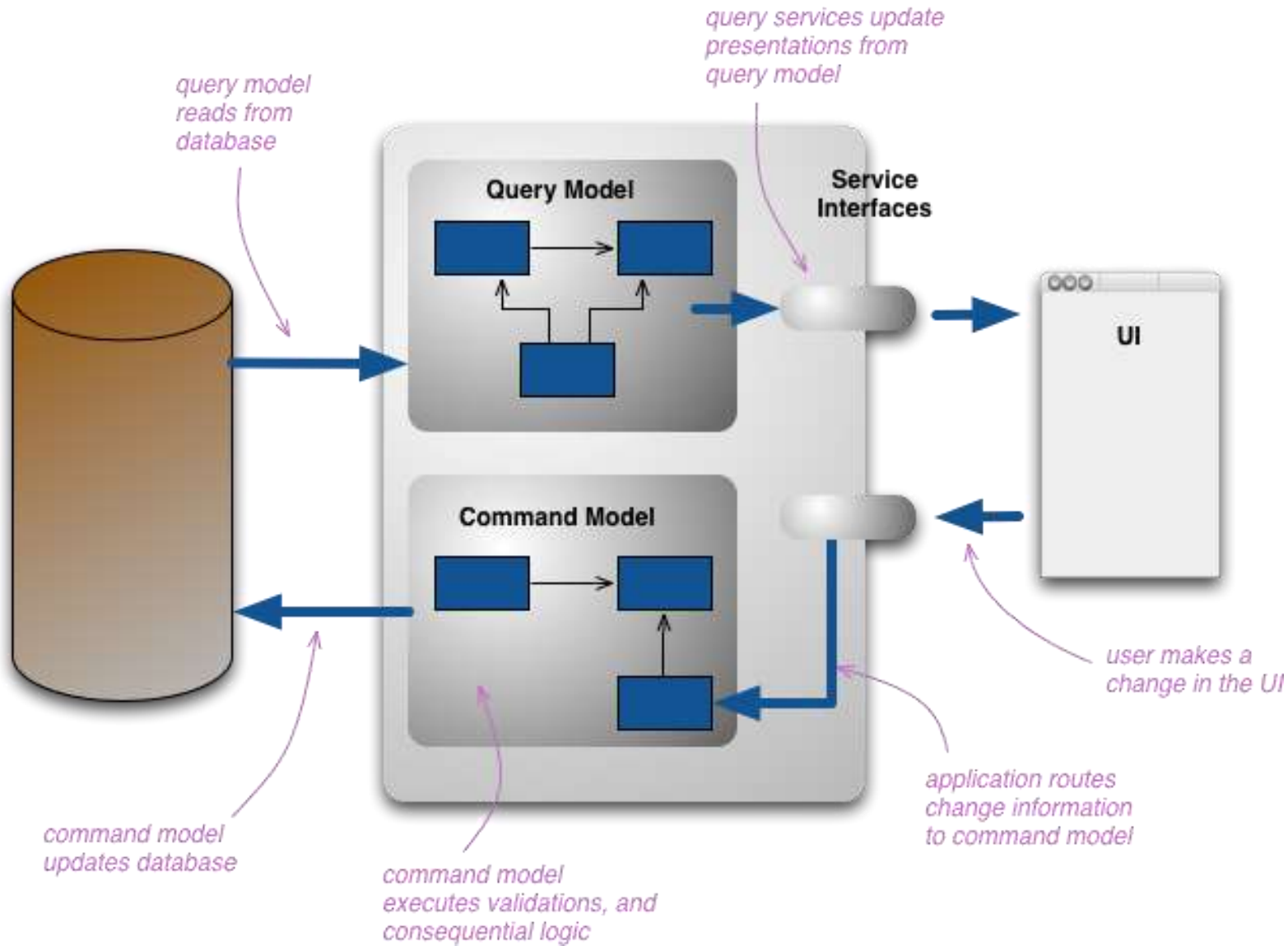
Event Sourcing

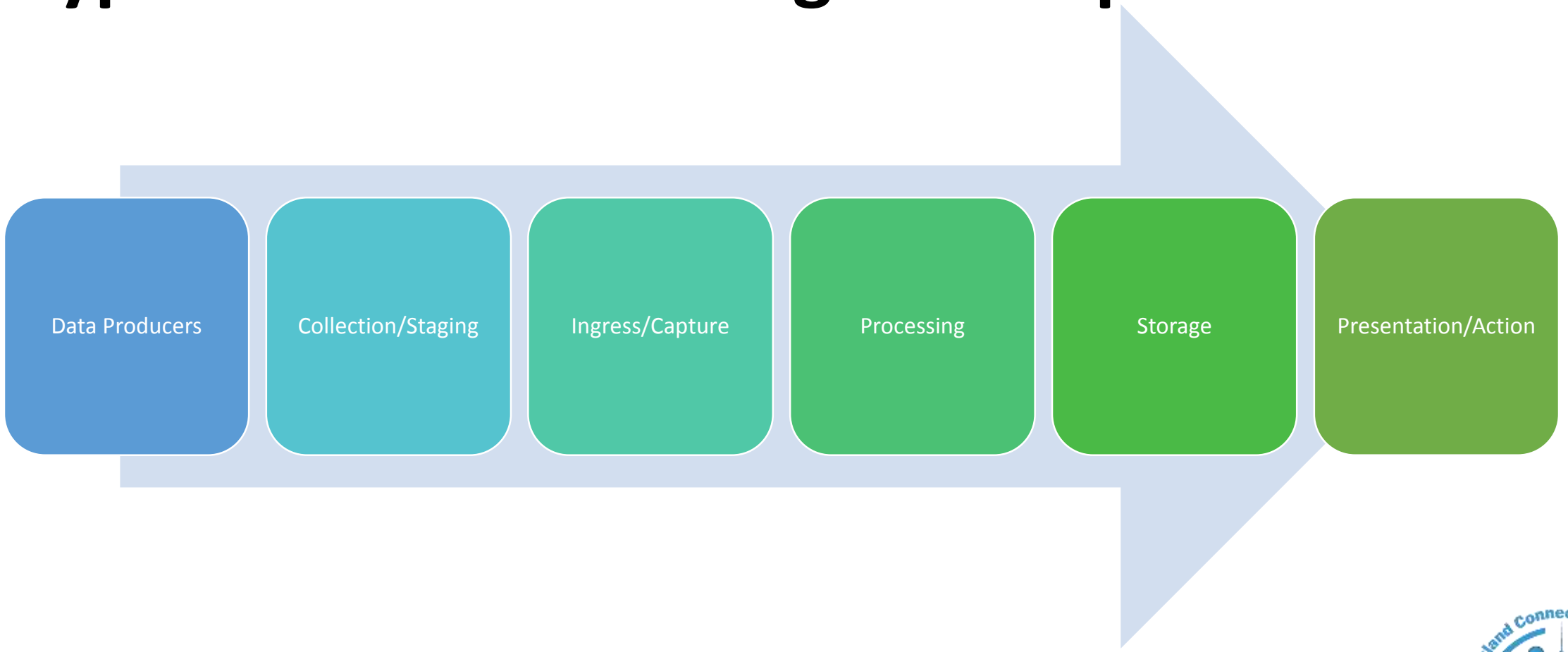
- App state & replayable event log
- Git, general ledgers are event sourced
- Can replay events to restore app state
- Pros: audit, debug, history, calculate corrections, in memory
- Cons: External systems, event schema, ids, versioning, complexity



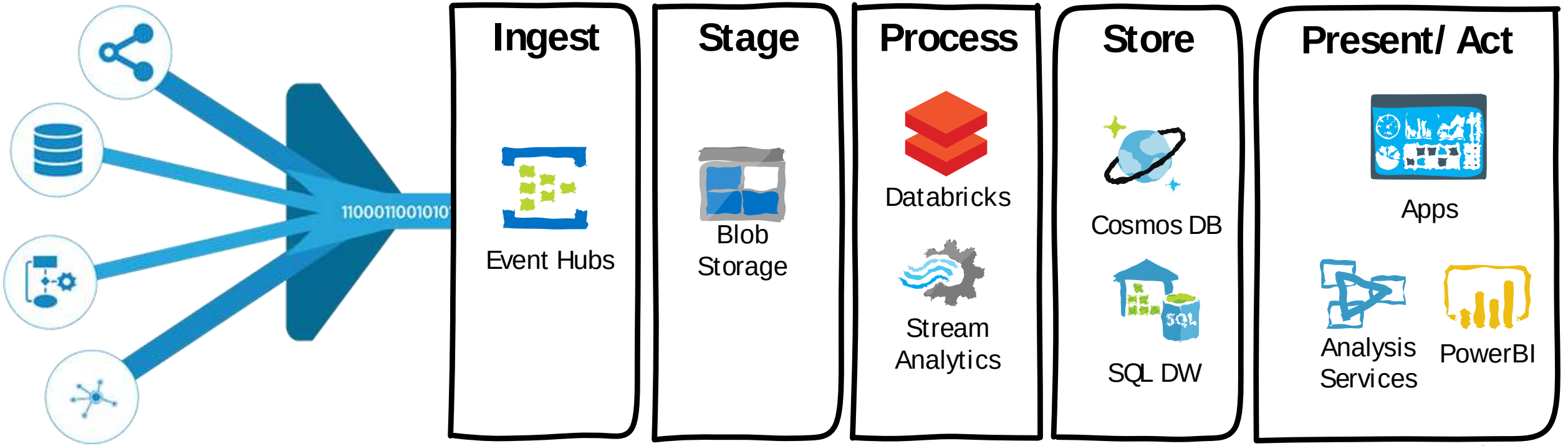
Command Query Responsibility Segregation



Typical Event Streaming Data Pipeline



Azure Data Pipelines



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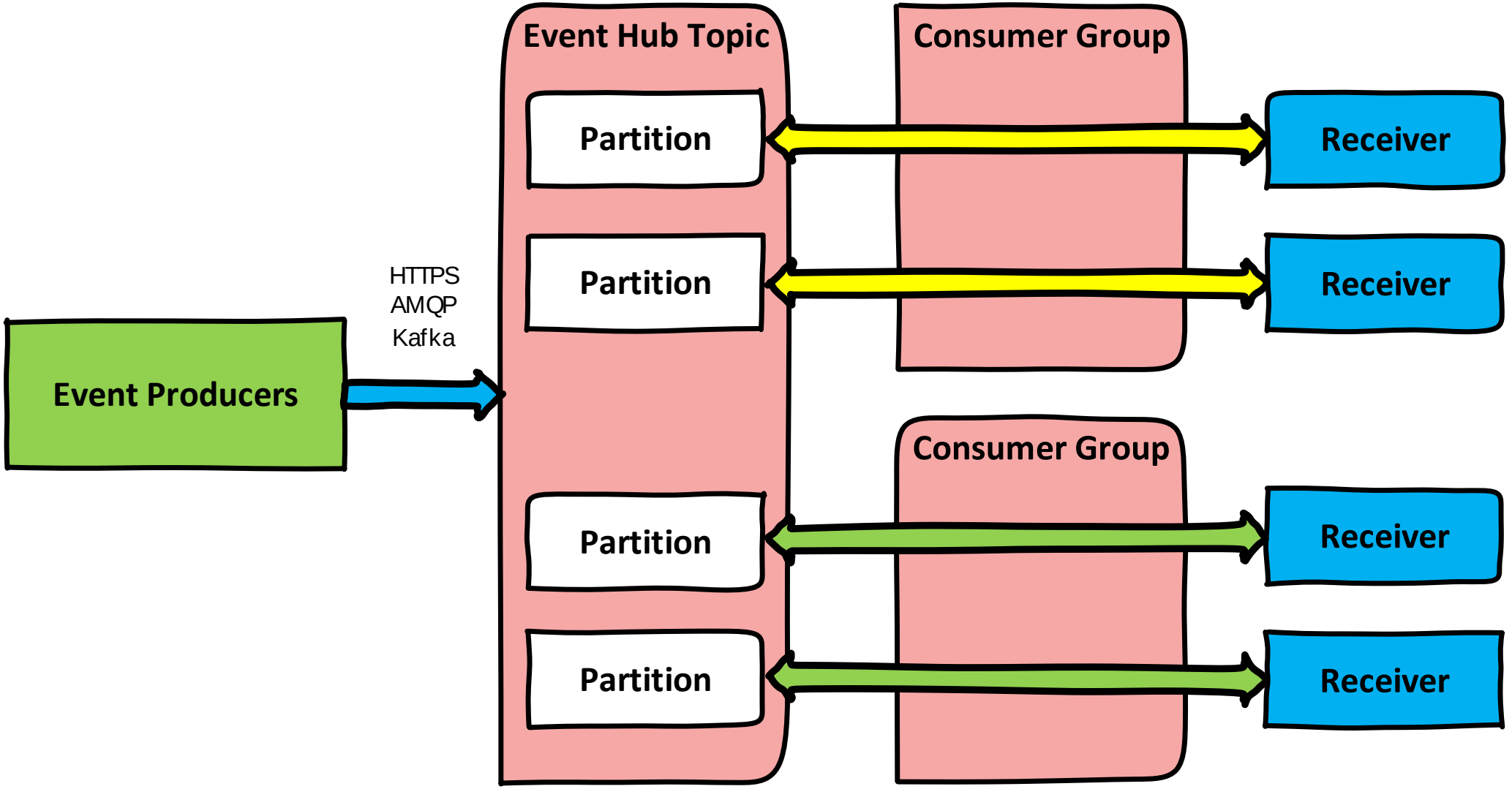
Kafka and Event Hubs

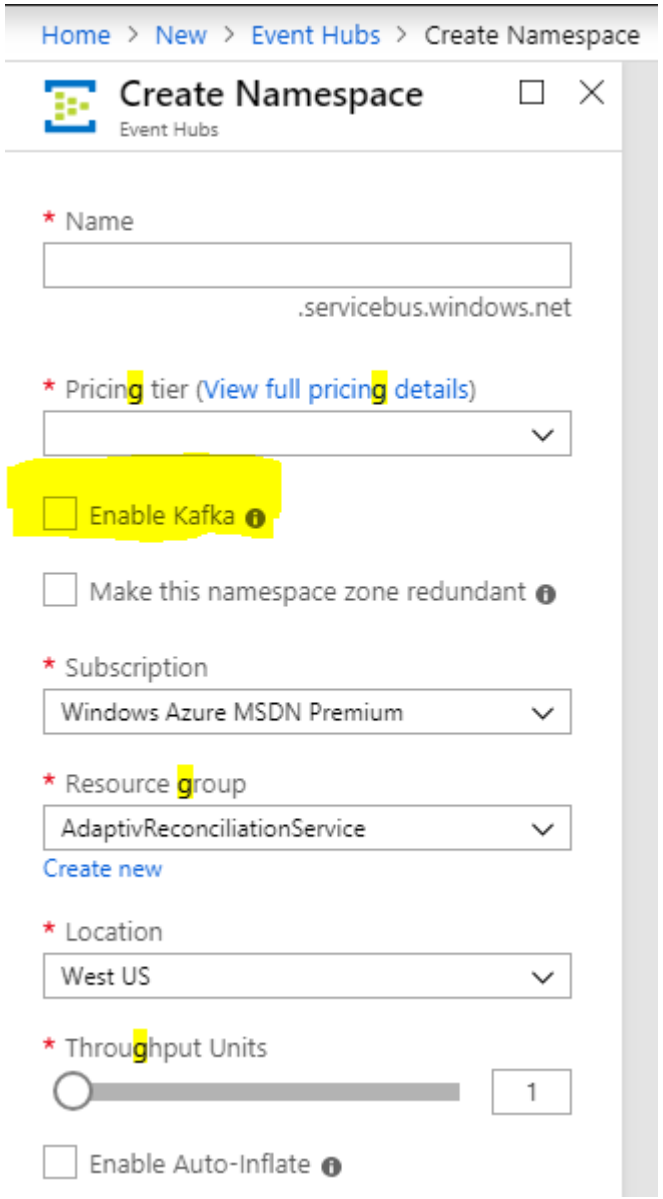


Distinguishing between Service Bus, Event Hubs, and Event Grid

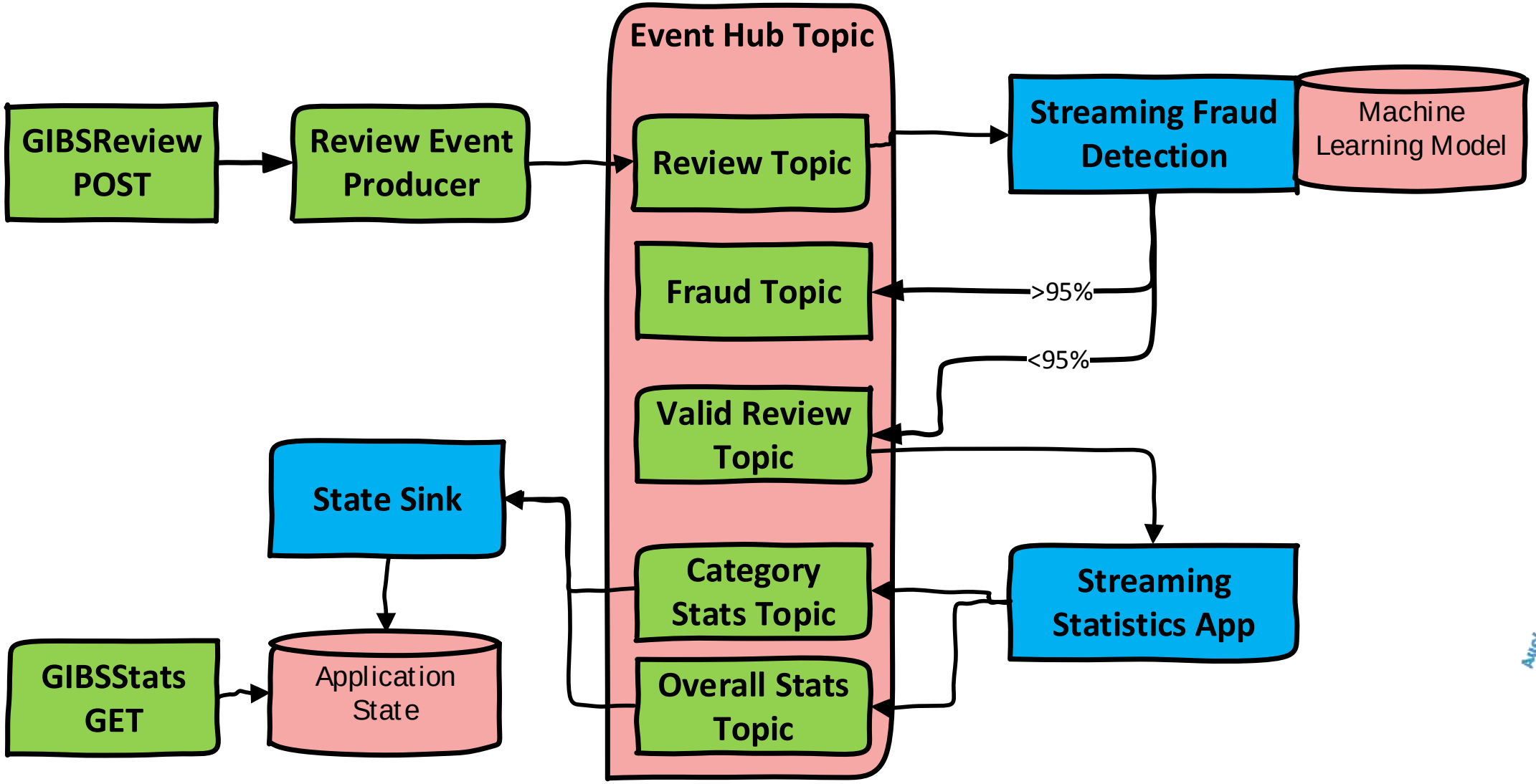
Service	Purpose	Type	When to use
Event Grid	Reactive programming	Event distribution (discrete)	React to status changes Notification Systems
Event Hubs	Big data pipeline	Event streaming (series)	Telemetry and distributed data streaming
Service Bus	High-value enterprise messaging	Message	Order processing and financial transactions

Demo

- Kafka Producer
- Event Hub Topic
- Kafka Consumer



Streaming Event Driven Architecture



Why use event hubs for Kafka

Challenges with running Kafka On-Prem

Procure Hardware

Install physical network

Install and manage OS

Provide physical security

Manage load balancing

Benefits of Event Hubs for Apache Kafka

PaaS Experience

Zero code setup

Fully managed

Easy to scale

Gateway to Cloud

Easily migrate data to cloud

Connect to Azure services such as Azure Functions, Azure Stream Analytics etc

Kafka Ecosystem + EventHub

Full power of Kafka Ecosystem tools

Scalability, manageability & security of Event Hubs

Event Hubs Capture and Auto

https://channel9.msdn.com/Shows/Azure-Friday/Azure-Event-Hubs-for-Apache-Kafka

Simplify running and managing Kafka clusters | Easily move data to Cloud | Comprehensive solution for Stream Analytics

Takeaways

- Avoid tightly coupled architectures
- Leverage event driven architecture appropriately
- Event Hubs for Kafka
  - Simplifies infrastructure concerns
  - Provides streaming ramp to the cloud
  - Best of both worlds, local control, cloud scale & simplicity

Reference material

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Reference material

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https://github.com/Azure/azure-event-hubs-for-kafka

https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-create-kafka-enabled

https://github.com/Azure/azure-event-hubs-for-kafka/tree/master/quickstart/

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Questions?