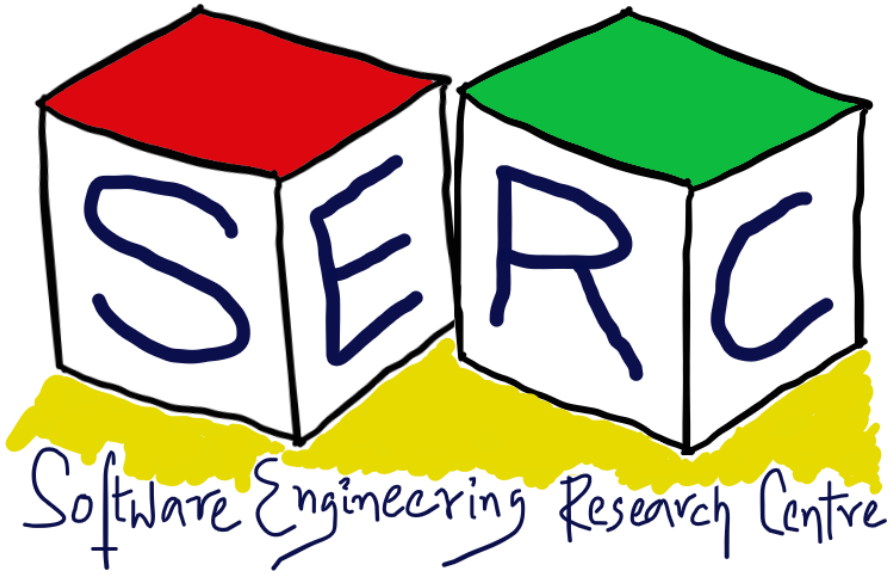
# Event Driven Architectures

**CS6.401 Software Engineering**

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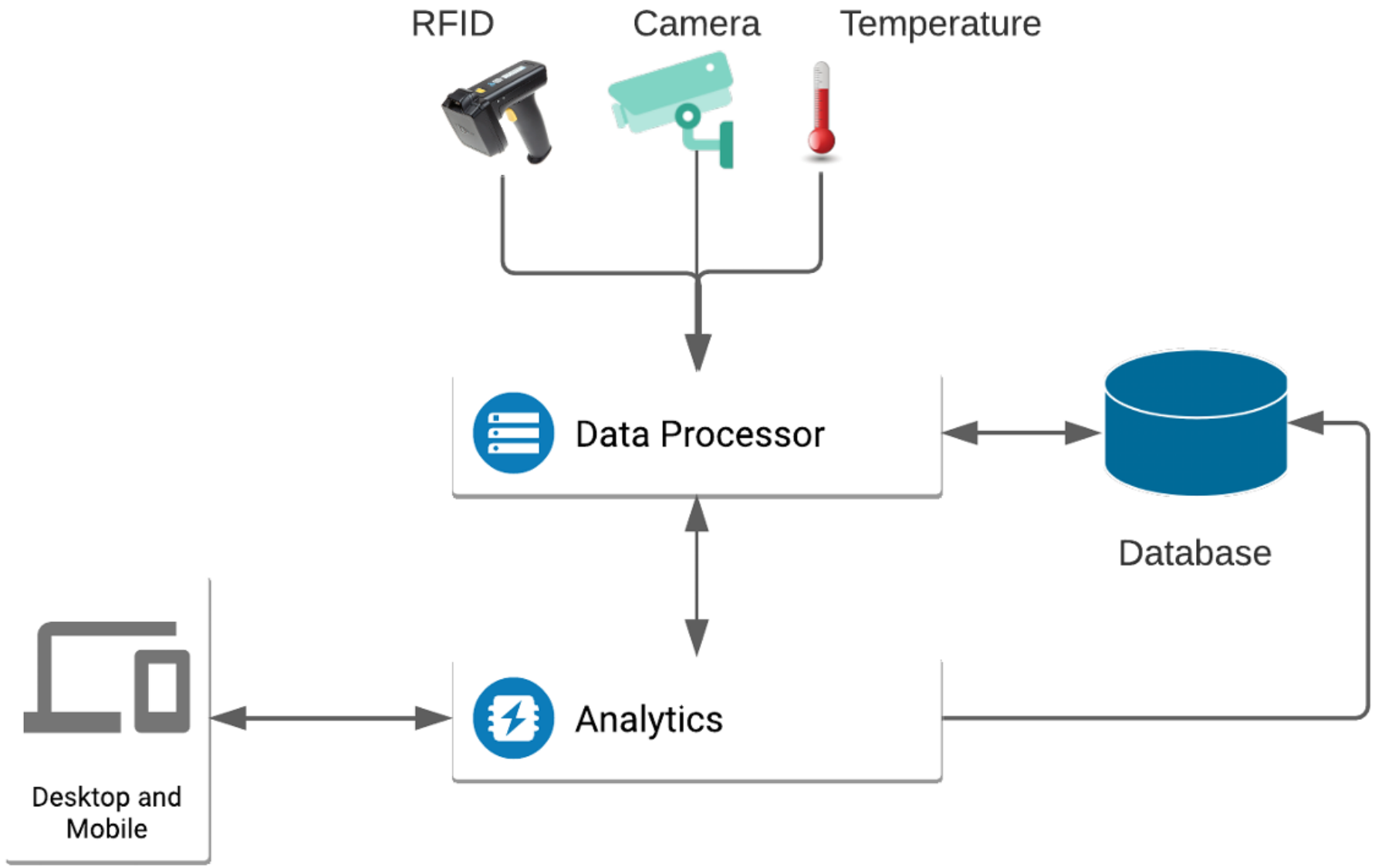
# Acknowledgements

The materials used in this presentation have been gathered/adapted/generate from various sources as well as based on my own experiences and knowledge -- Karthik Vaidhyanathan

Sources:
1. Software Architecture Patterns, Oreilly
2. Various sources from the web that has been duly credited in the respective slide

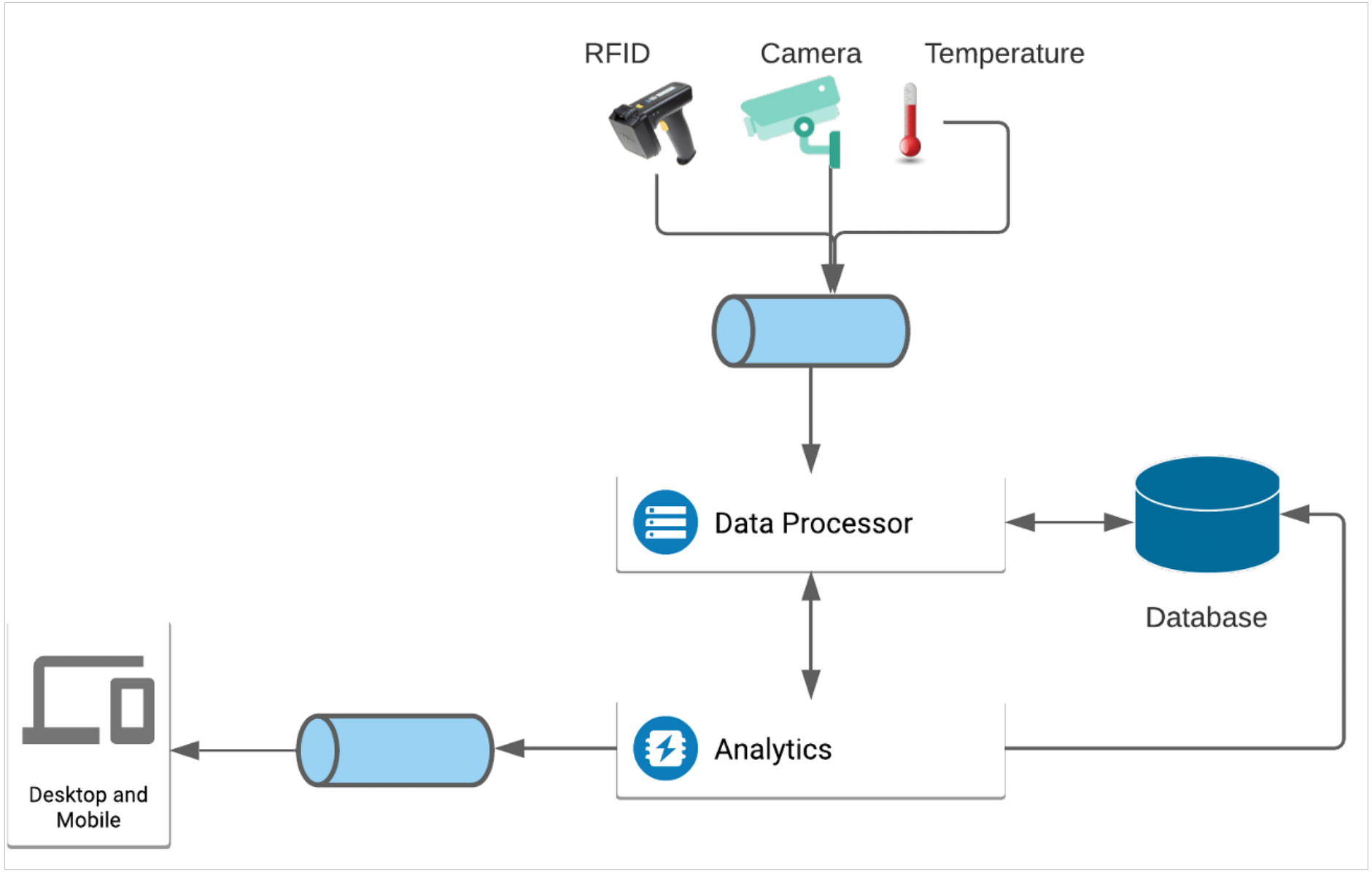
# Events?

# An Intuition




How good is the above design?

# Add Pub/sub components



# Event Driven Architecture (EDA)

# Event-driven Architectures: An Overview

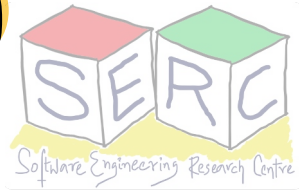
- Independent components asynchronously emit and receive events communicated over event buses
- Produce, detect and consume events
- Highly decoupled components – Minimal amount of coupling (topics, queue names, etc.)

## Design elements

- Components: concurrent event generators and event consumers
- Connectors: event bus (may be more than one)
- Data: events

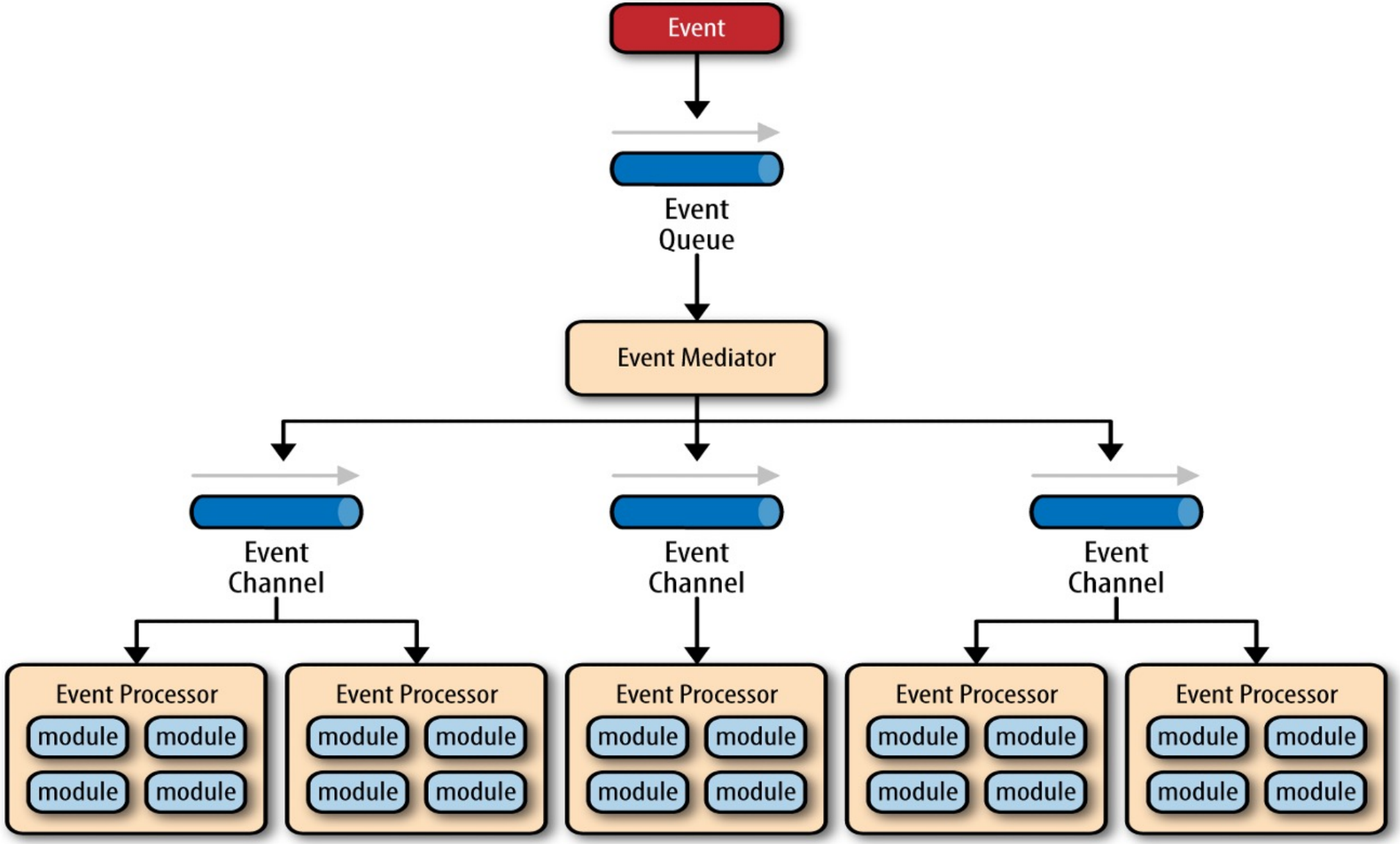
## Topology

- Communication via the event bus or link only (Mediator or Broker)



# EDA: Mediator Topology

# Event-Driven Architectures: Mediator

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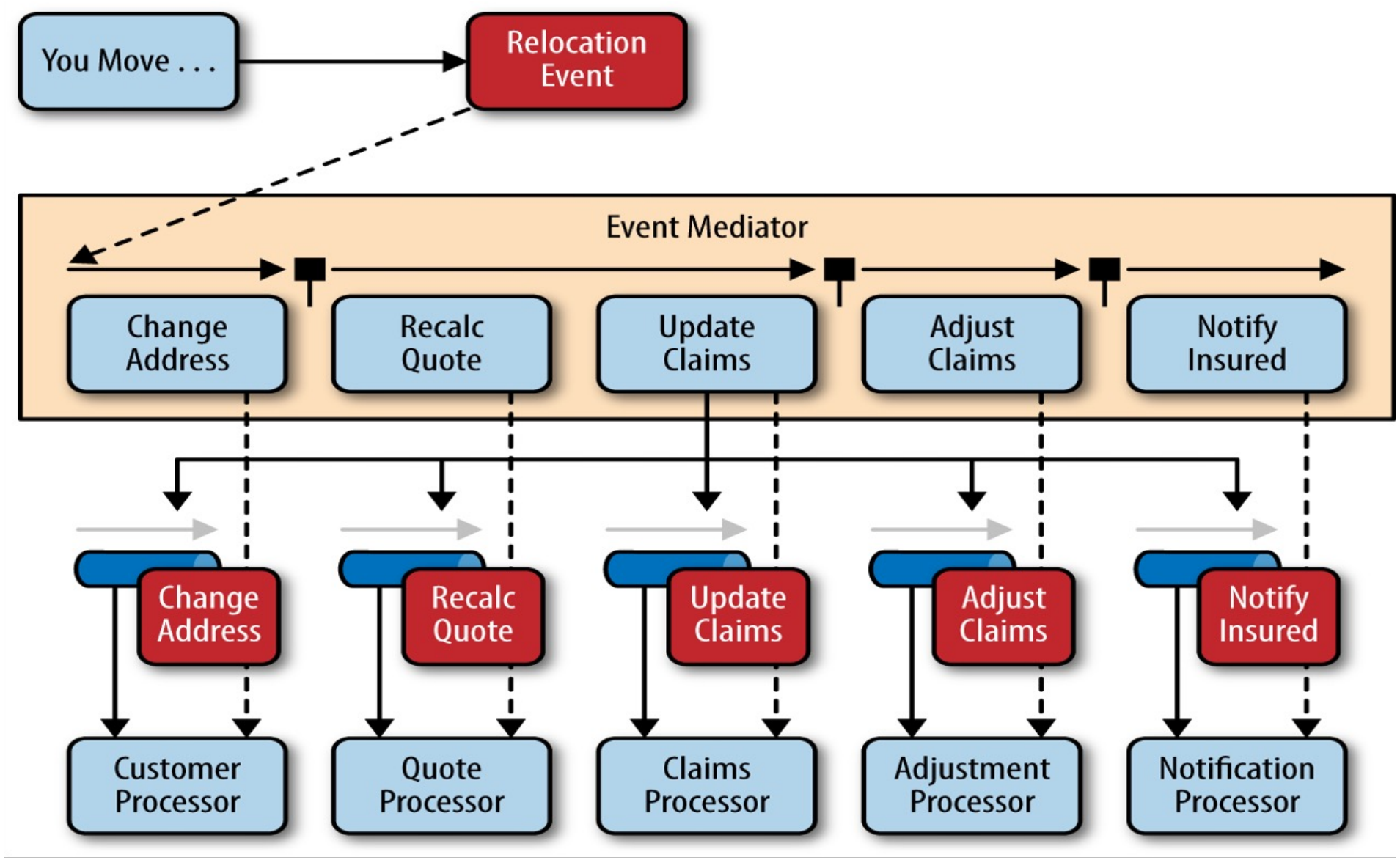
# Event-Driven Architectures: Mediator

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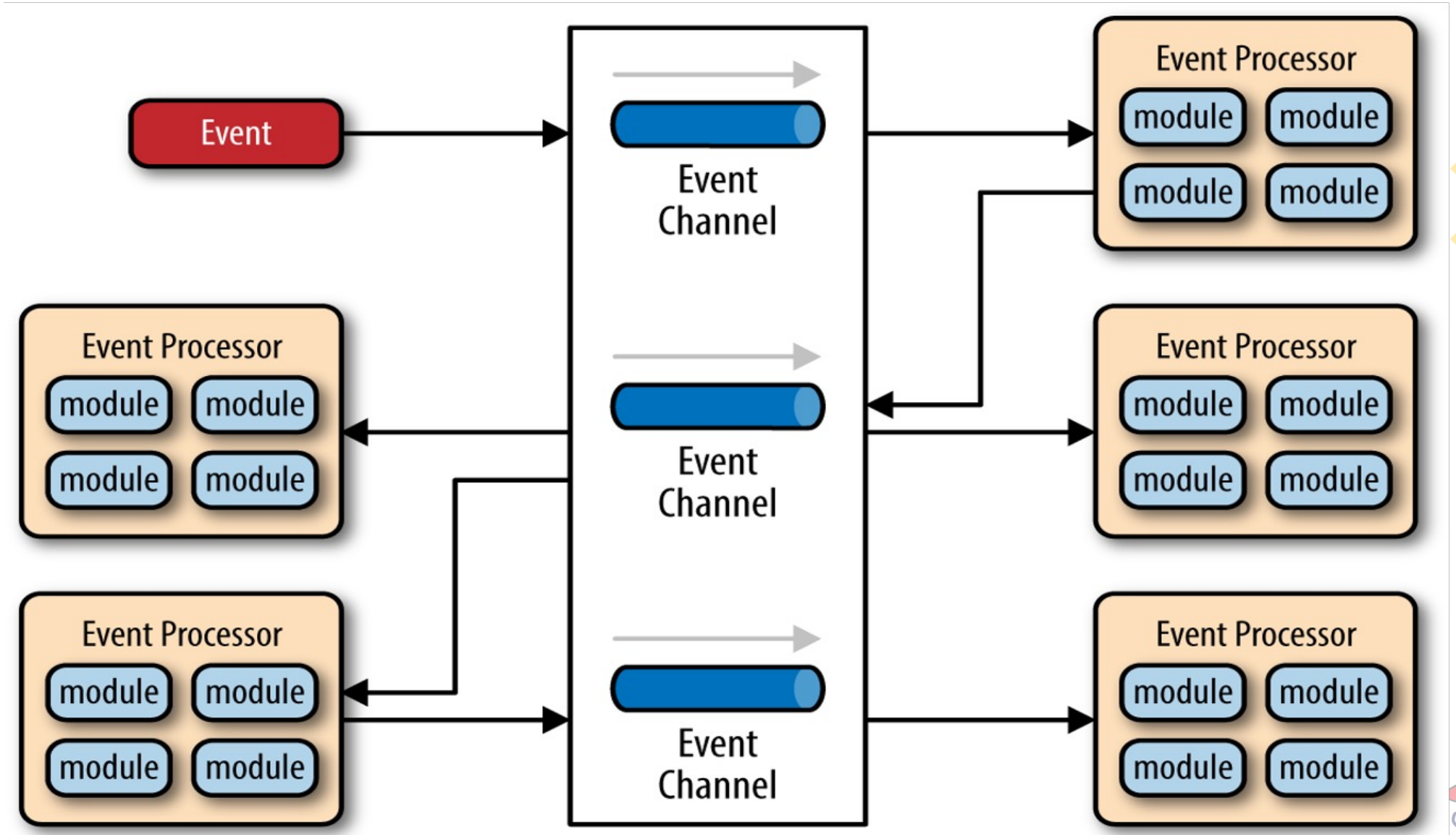
# Mediator Topology: An Overview

- Similar to the Orchestration in traditional SOA
- Two key events – Initial and Processing event
- Four main types of components:
  - Event queue – Responsible to transfer events to event mediator
  - Event Mediator – Orchestrates the processing of events to accomplish the overall functionality
  - Event Channel - Topics or queues to which events are ingested by mediator (eg: Kafka topic )
  - Event Processor - Implements the business logic
    - Can be fine grained or Coarse grained)
    - Advice: keep it to one functionality

# EDA: Broker Topology

# Event-Driven Architectures: Broker

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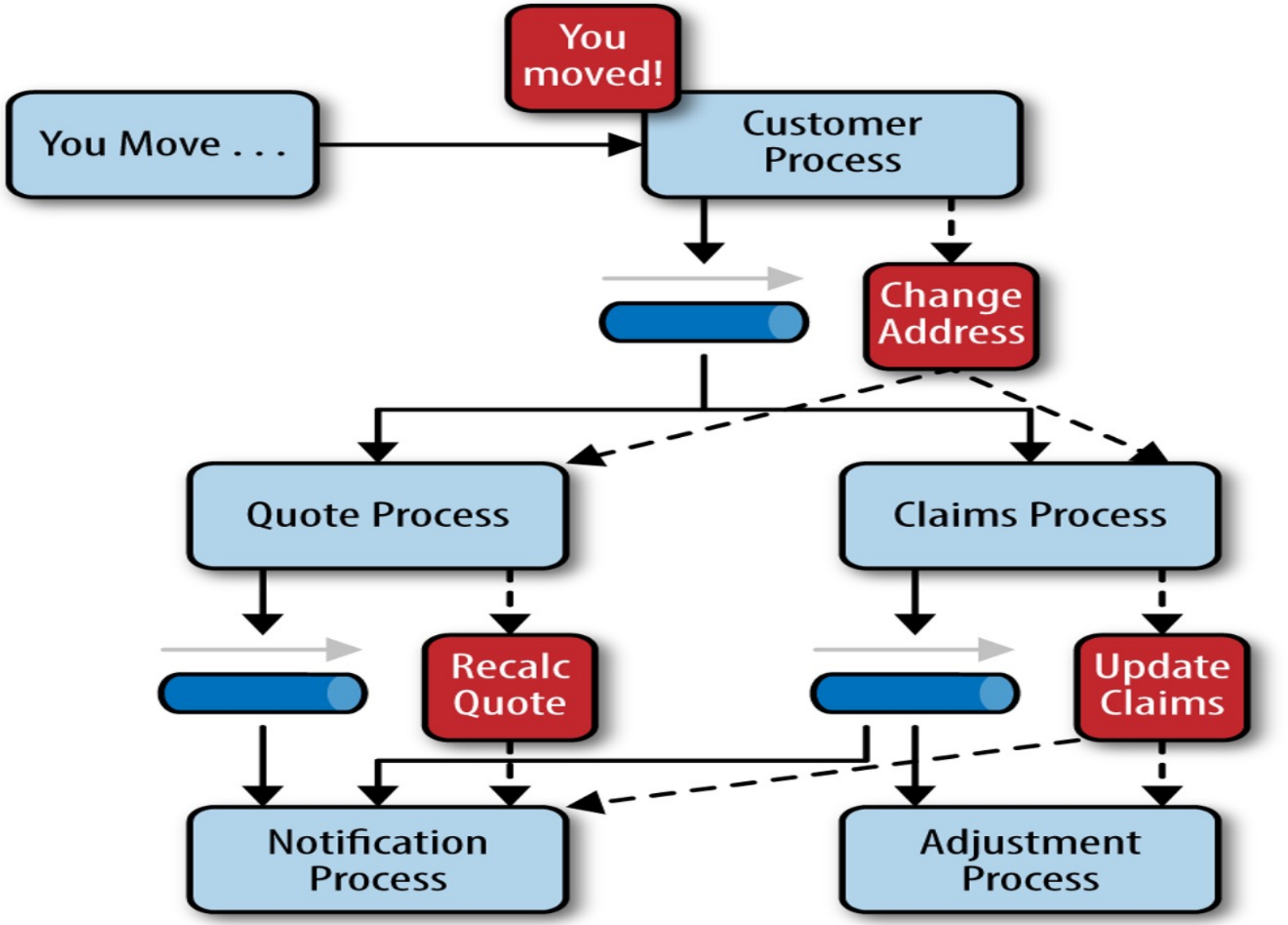
# Event-Driven Architectures: Broker

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# Broker Topology: An Overview

- Similar to the Choreography in traditional SOA

- Two main types of components:
  - Broker – Consists of all the event channels for event processing. Can be topics or queues
  - Event Processor – Responsible for processing the event and sending a notification to the event channels

# Summarizing

# Event-Driven Architectures

## Advantages

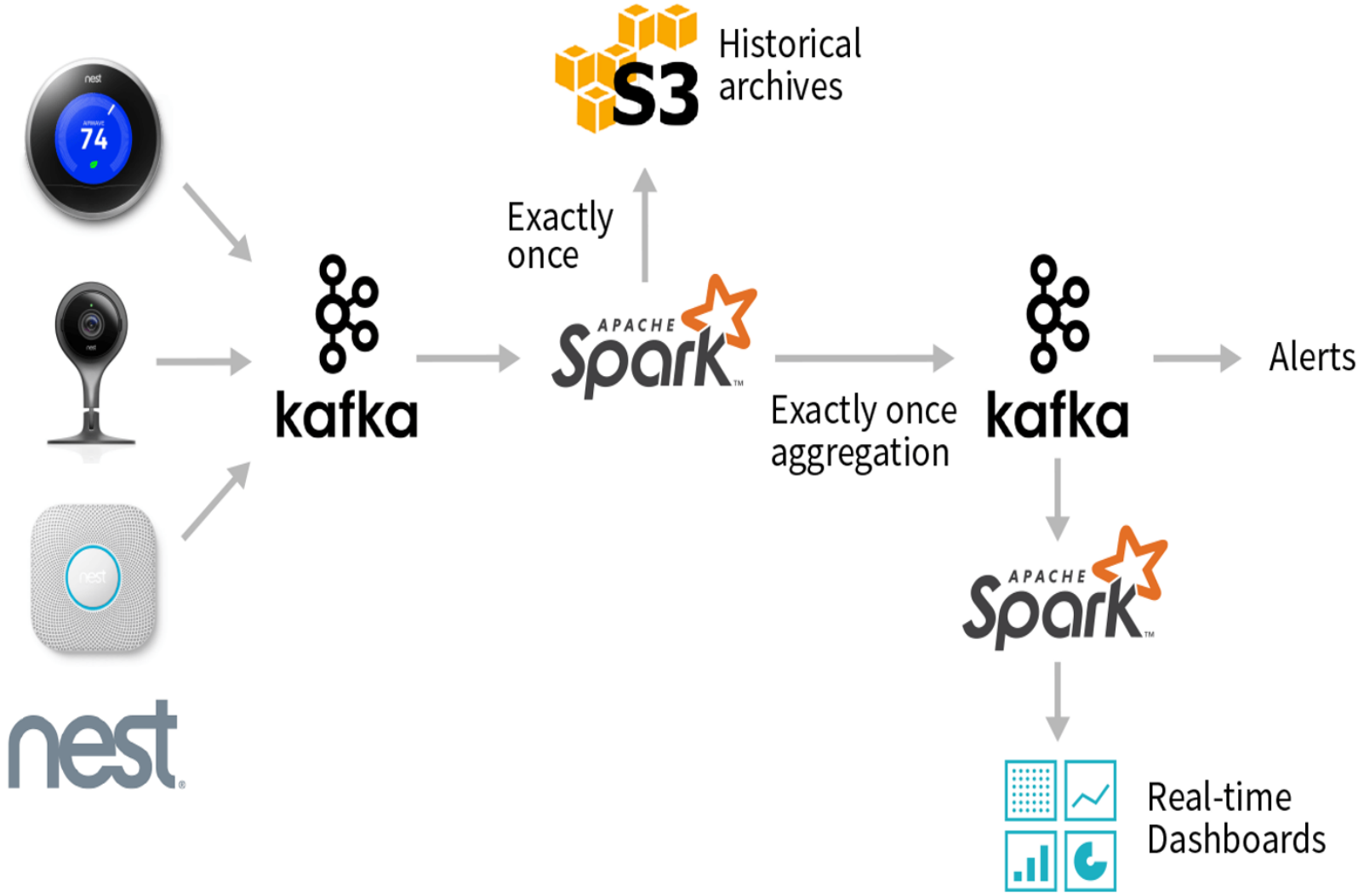
1. High performance
2. High Scalability
3. Ease of Deployment
4. Ease of modifications/Evolved easily

## Disadvantages

1. Remote process availability – Liveliness of a consumer
2. Lack of responsiveness
3. Broker or mediator failures
4. Testing can be tedious
5. Development can be complex

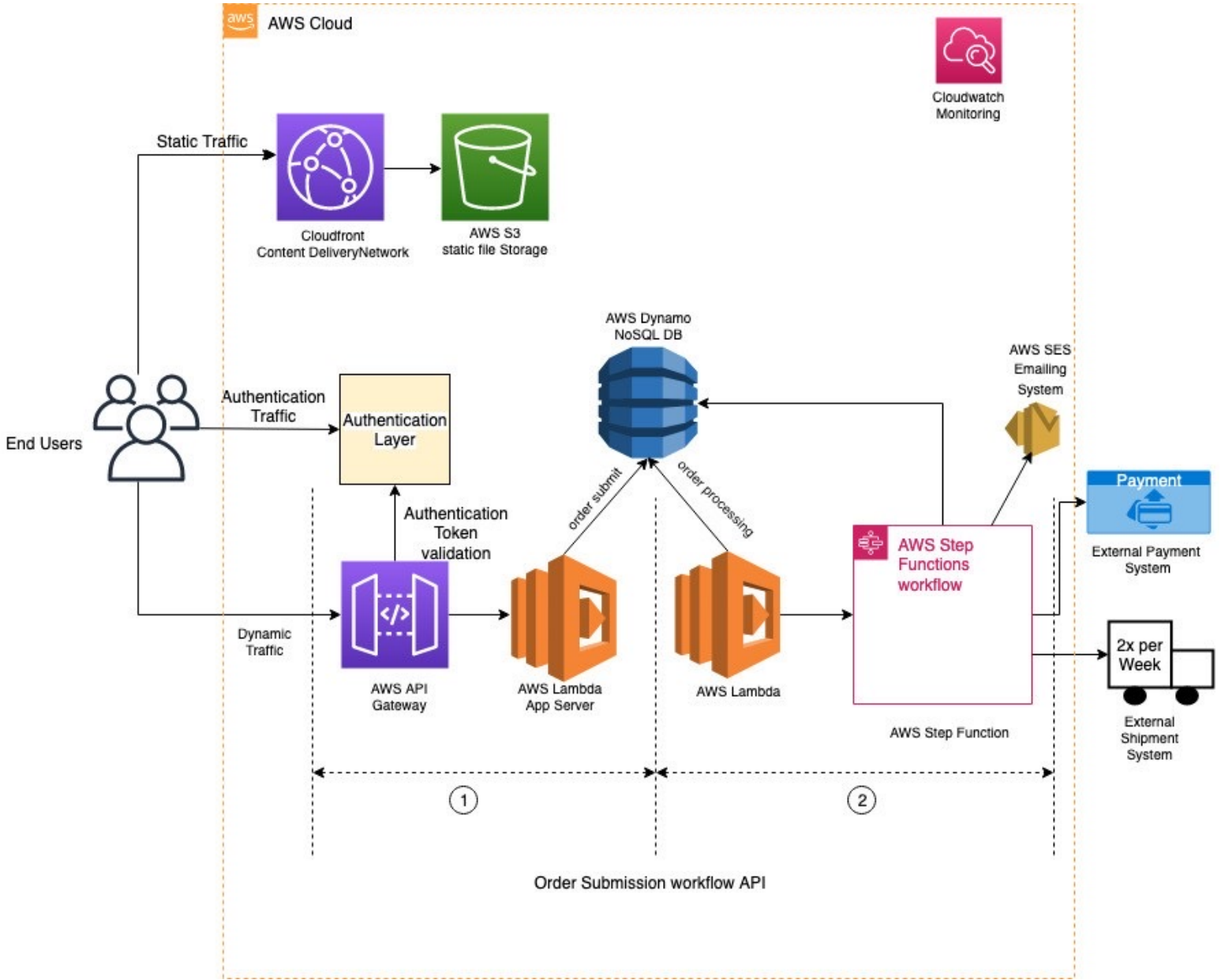
# Some Examples

# Event-Driven Architectures




https://databricks.com/blog/2017/04/26/processing-data-in-apache-kafka-with-structured-streaming-in-apache-spark-2.html

# Event-Driven Architectures




**Source:** AWS blogs

# Thank You

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