Event-Driven Architecture in the Cloud

TechBash
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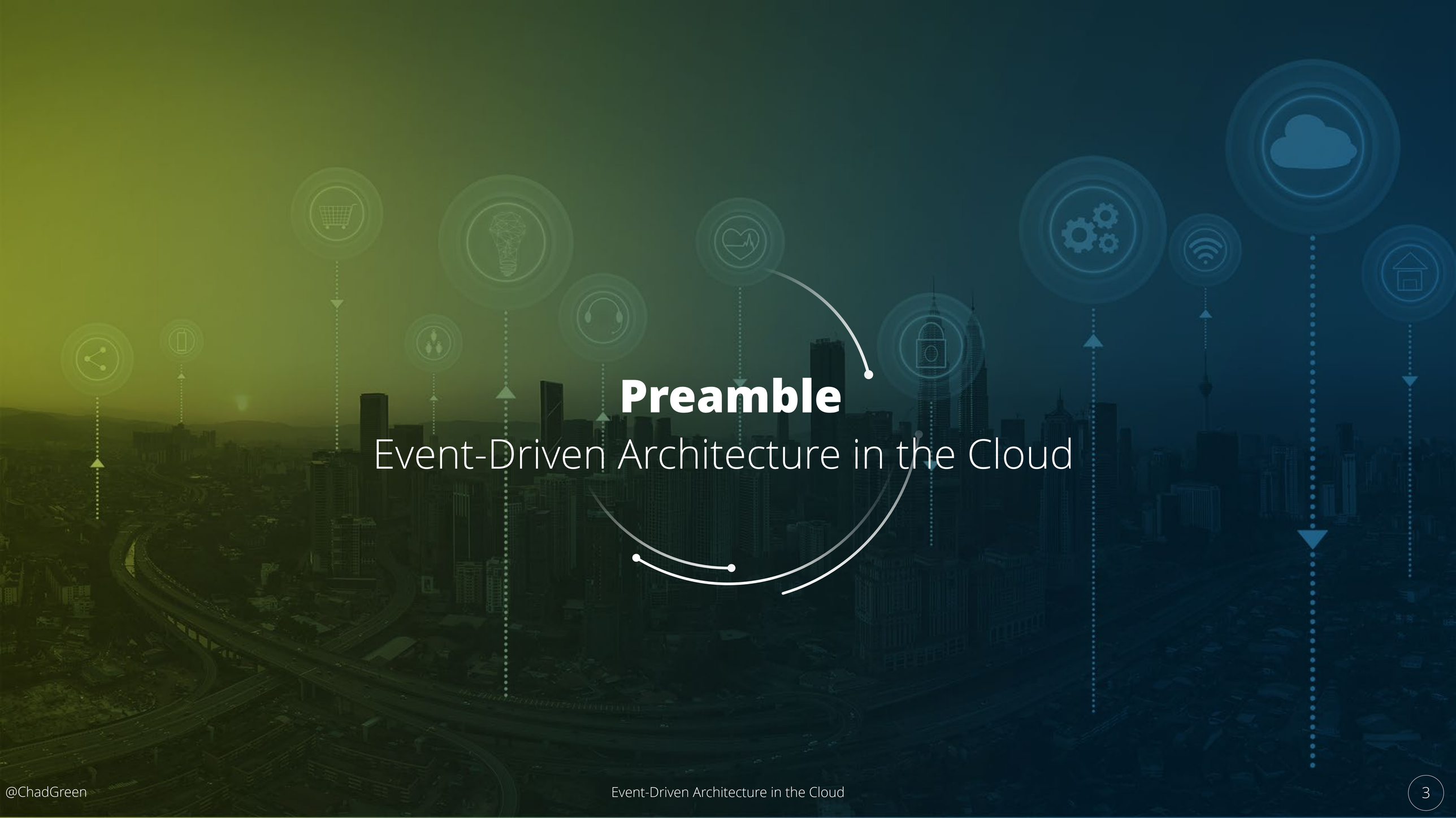
{Code PaLOUsa}
IT'S SOFTWARE DEVELOPMENT MADNESS



Preamble

Event-Driven Architecture in the Cloud

Enterprise Architecture

Enterprise architecture applies architecture principles and practices to guide organizations through the business, information, process, and technology changes necessary to execute their strategies.

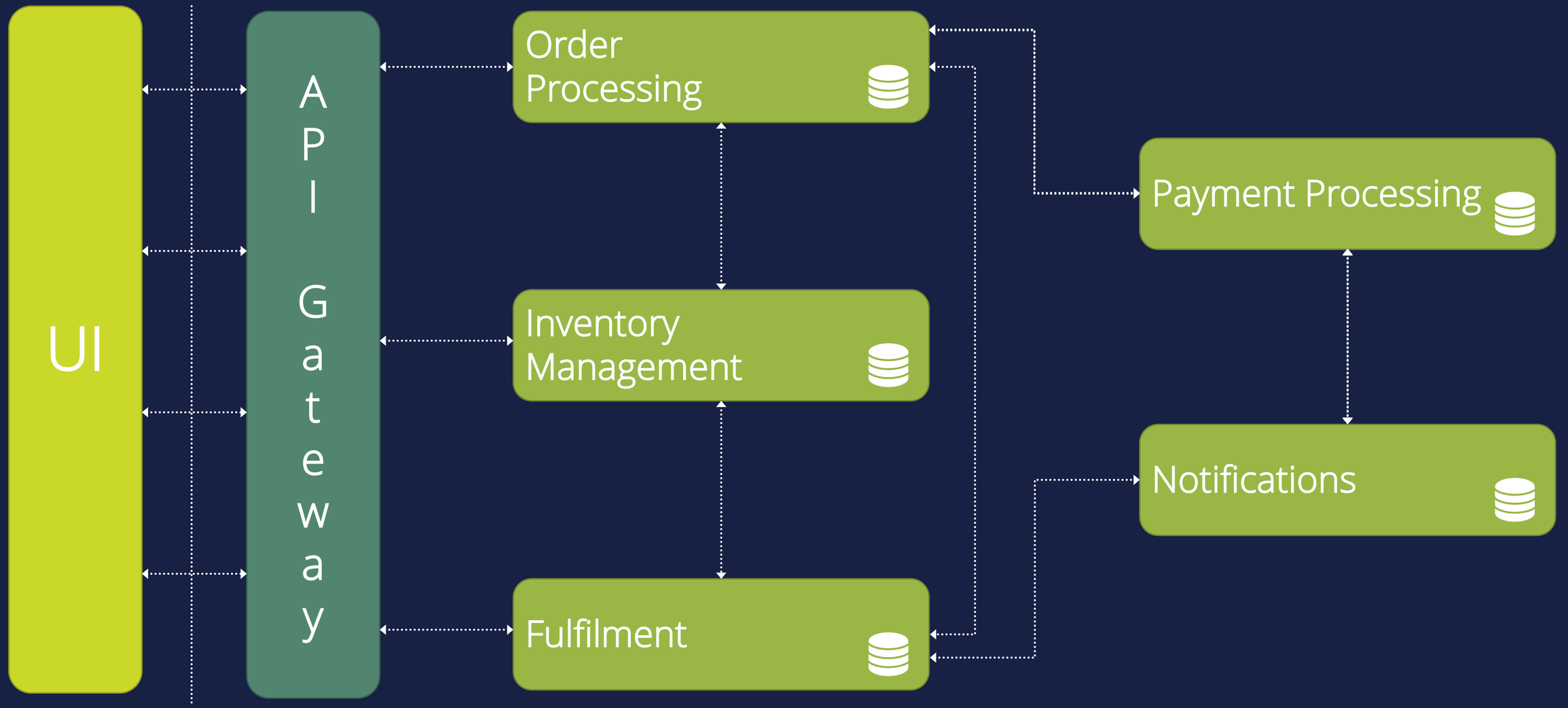
- Wikipedia -

Monolith

Enterprise Architecture

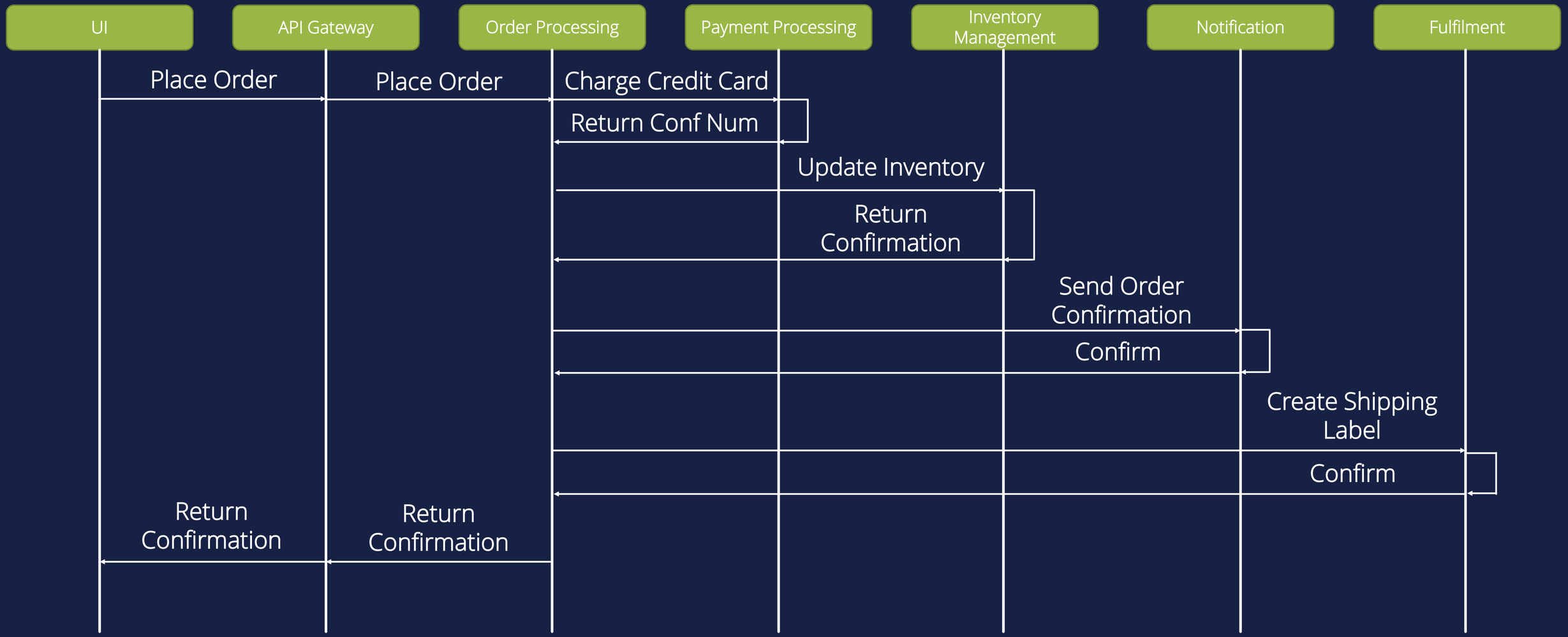
Microservices

Enterprise Architecture



Process Flow

Microservices

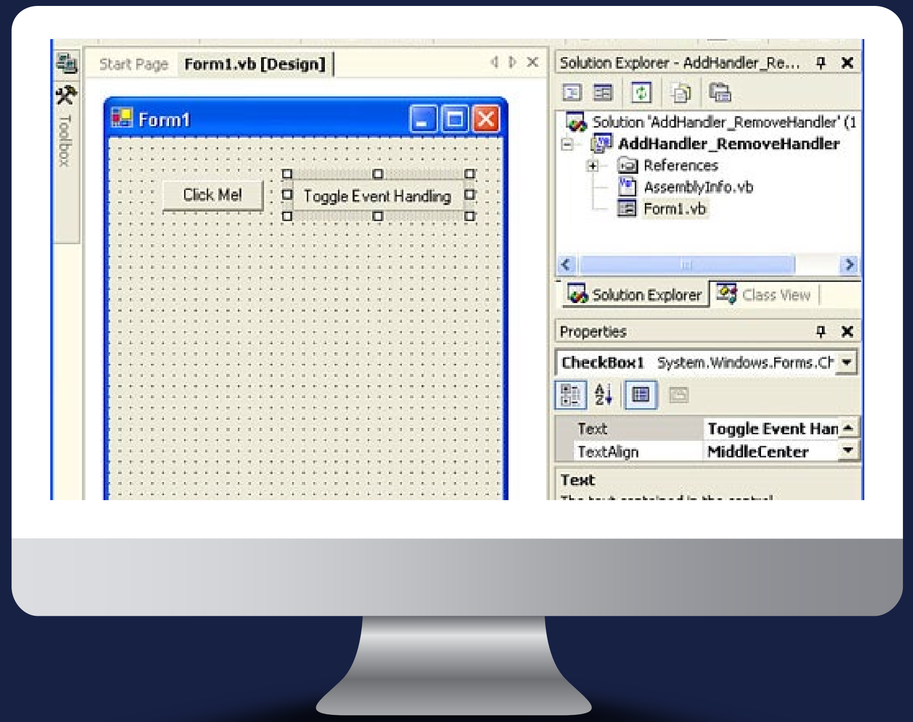


Event-Driven Architecture

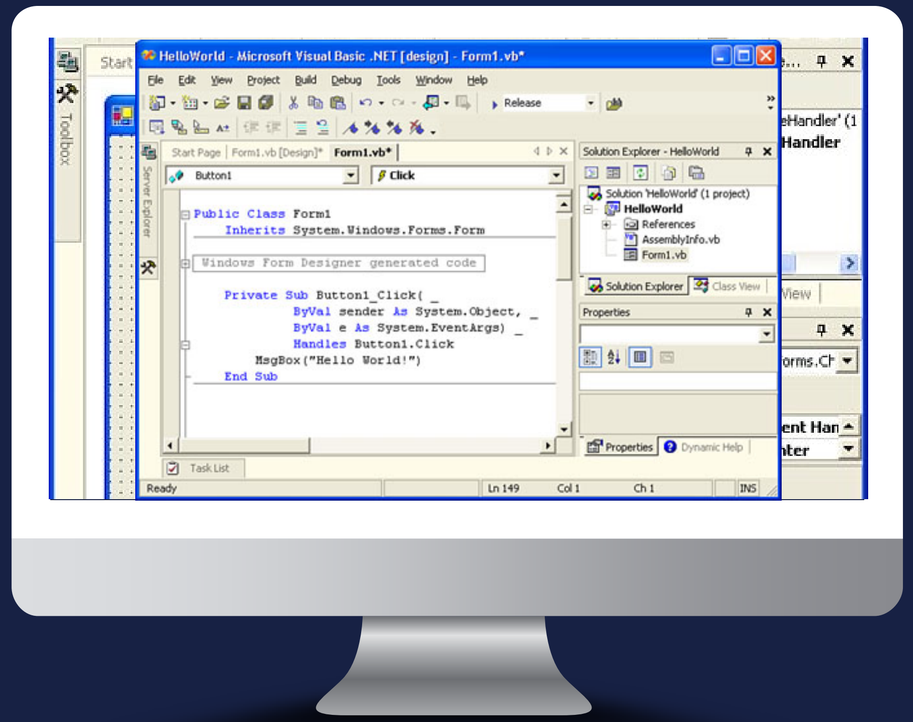
> A software architecture pattern promoting the production, detection, consumption of, and reaction to events.

- Wikipedia -

Event-Driven Architecture



Event-Driven Architecture



Event-Driven Architecture

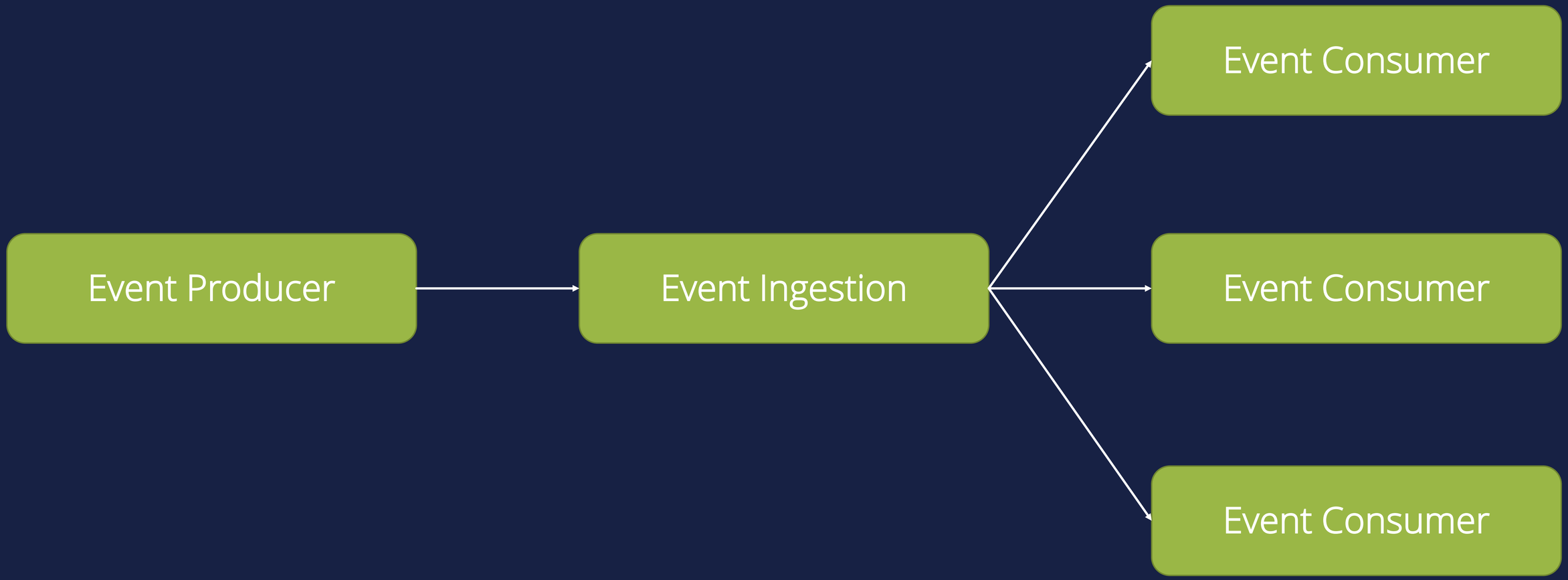
“

Event-driven architecture (EDA) is a design paradigm in which a software component executes in response to receiving one or more event notifications.

EDA is more loosely coupled than the client/server paradigm because the component that sends the notification doesn’t know the identity of the receiving components at the time of compiling.

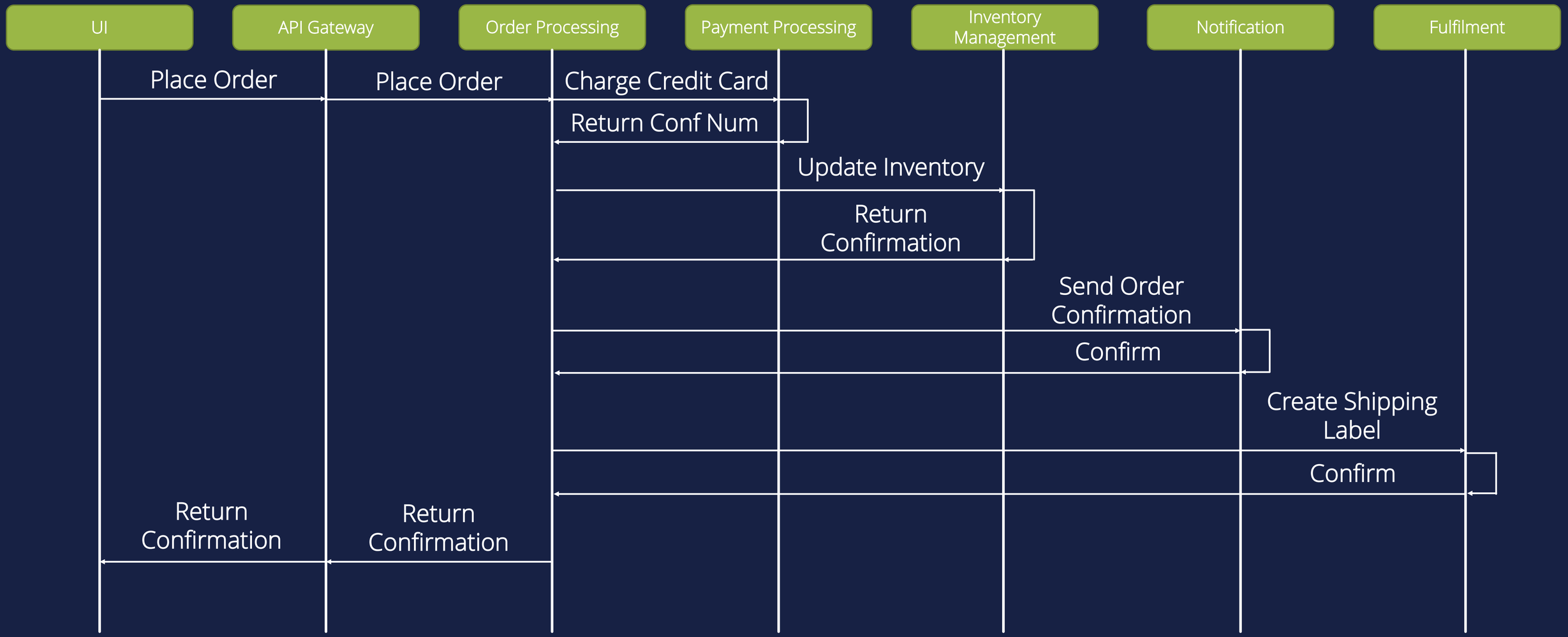
- Gartner -

Event-Driven Architecture



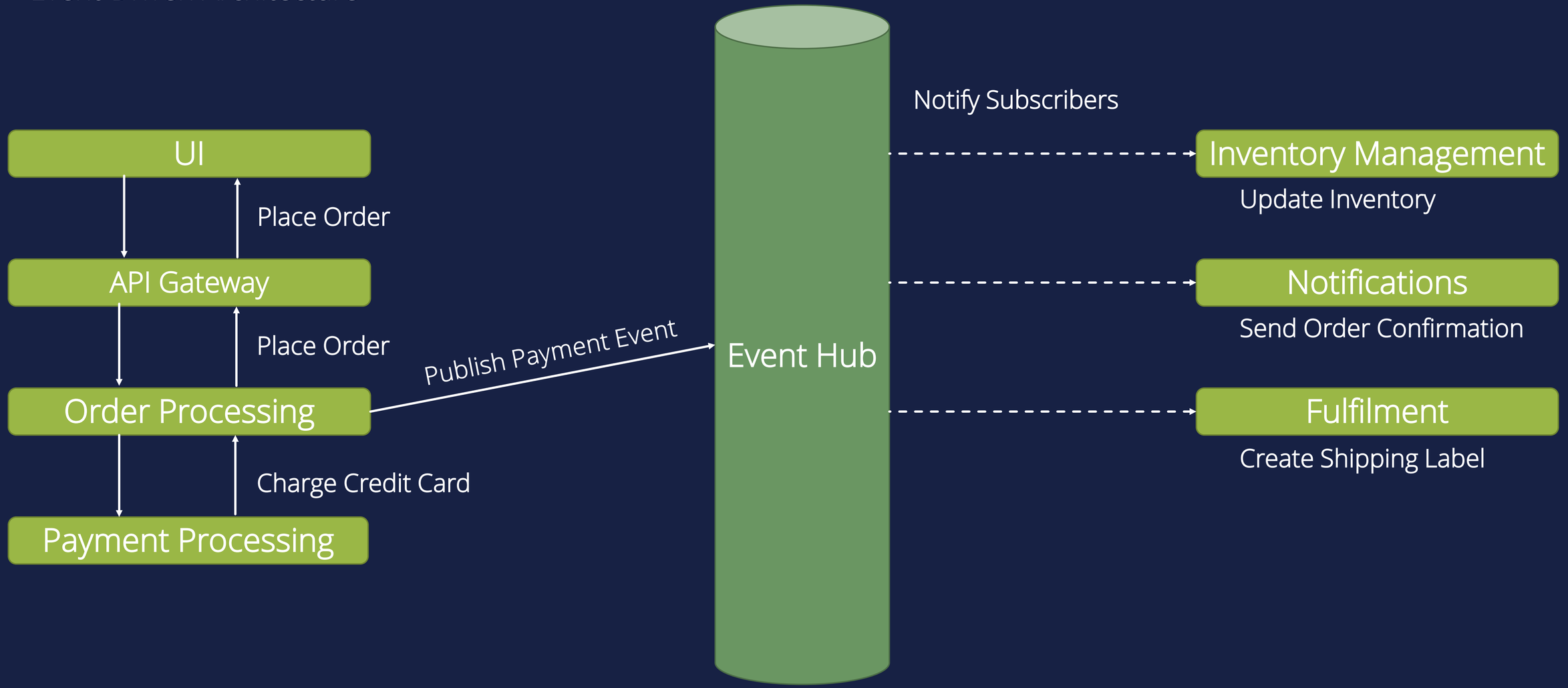
Microservices

Enterprise Architecture



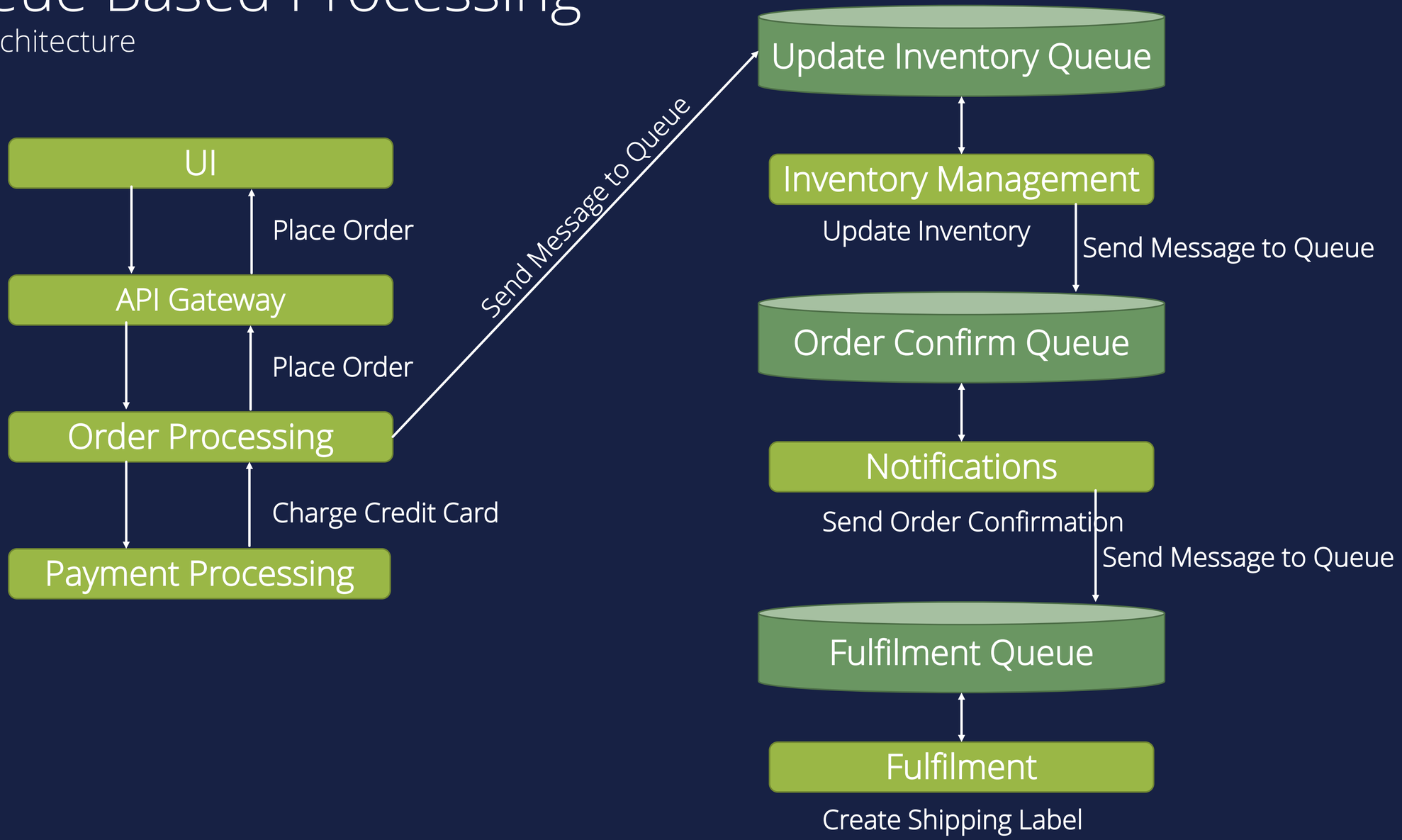
Process Flow

Event-Driven Architecture



Not Queue Based Processing

Event-Driven Architecture

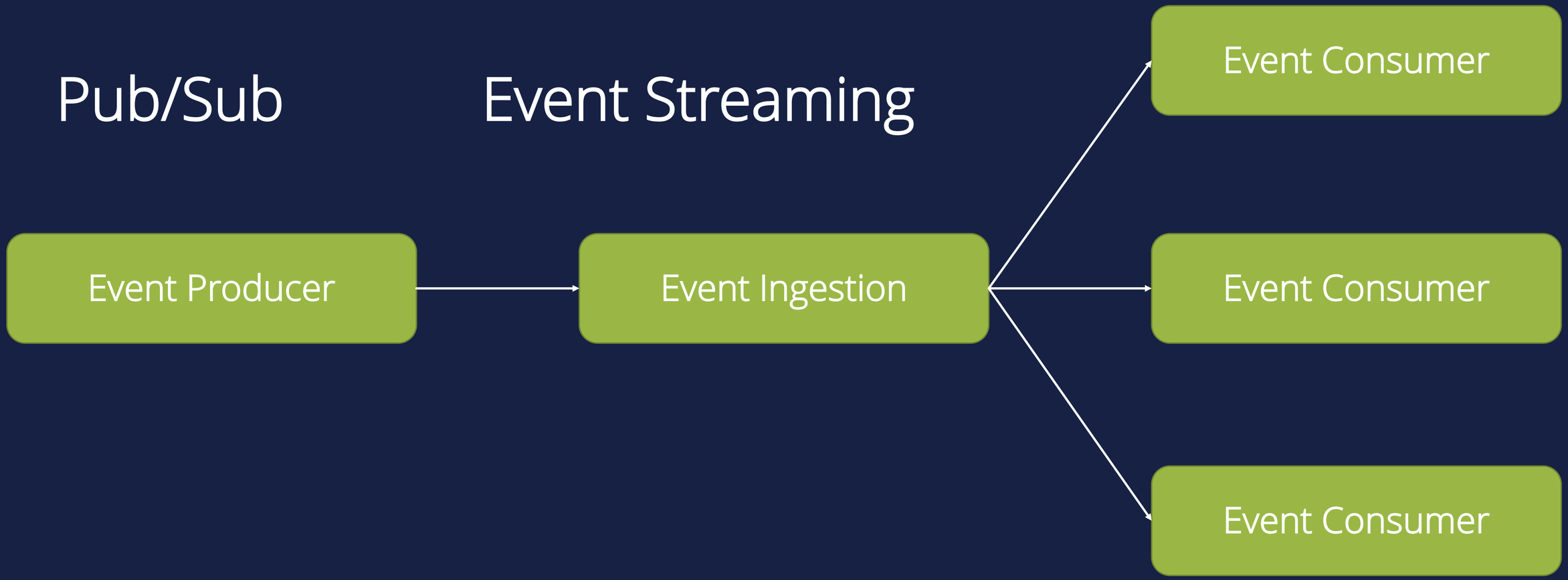


Event Consumption Models

Event-Driven Architecture

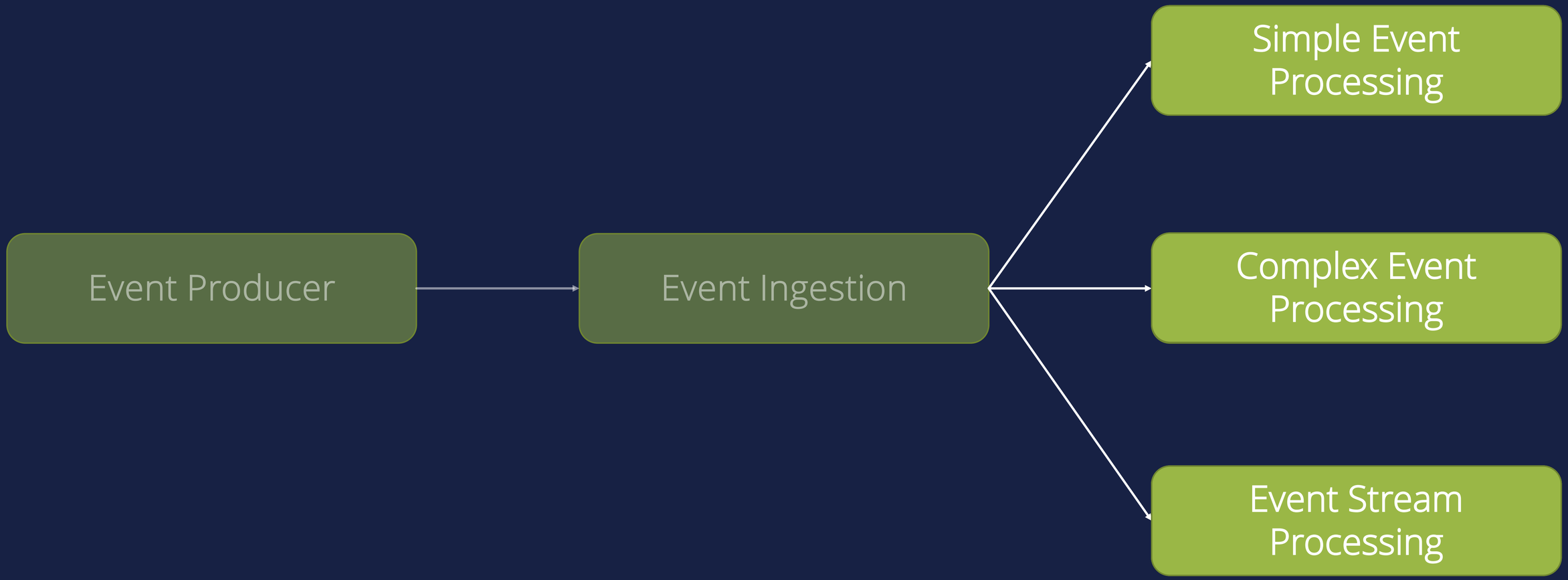
Pub/Sub

Event Streaming



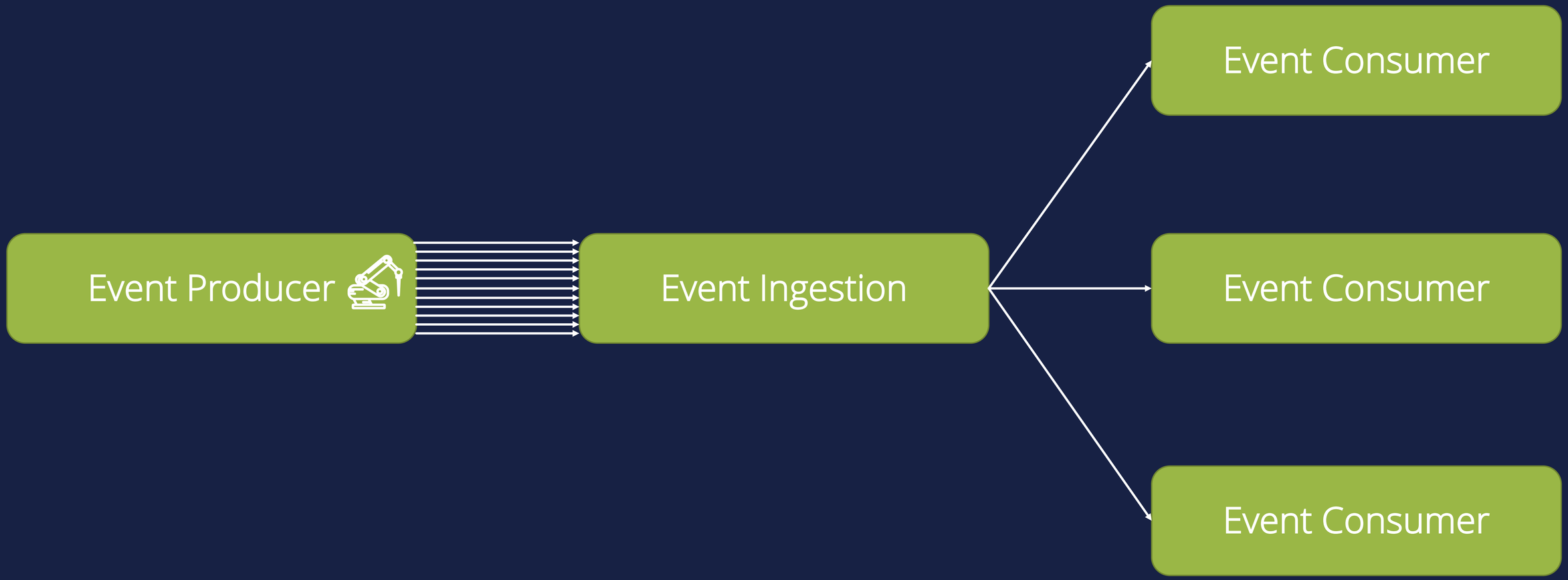
Consumer Processing Variations

Event-Driven Architecture



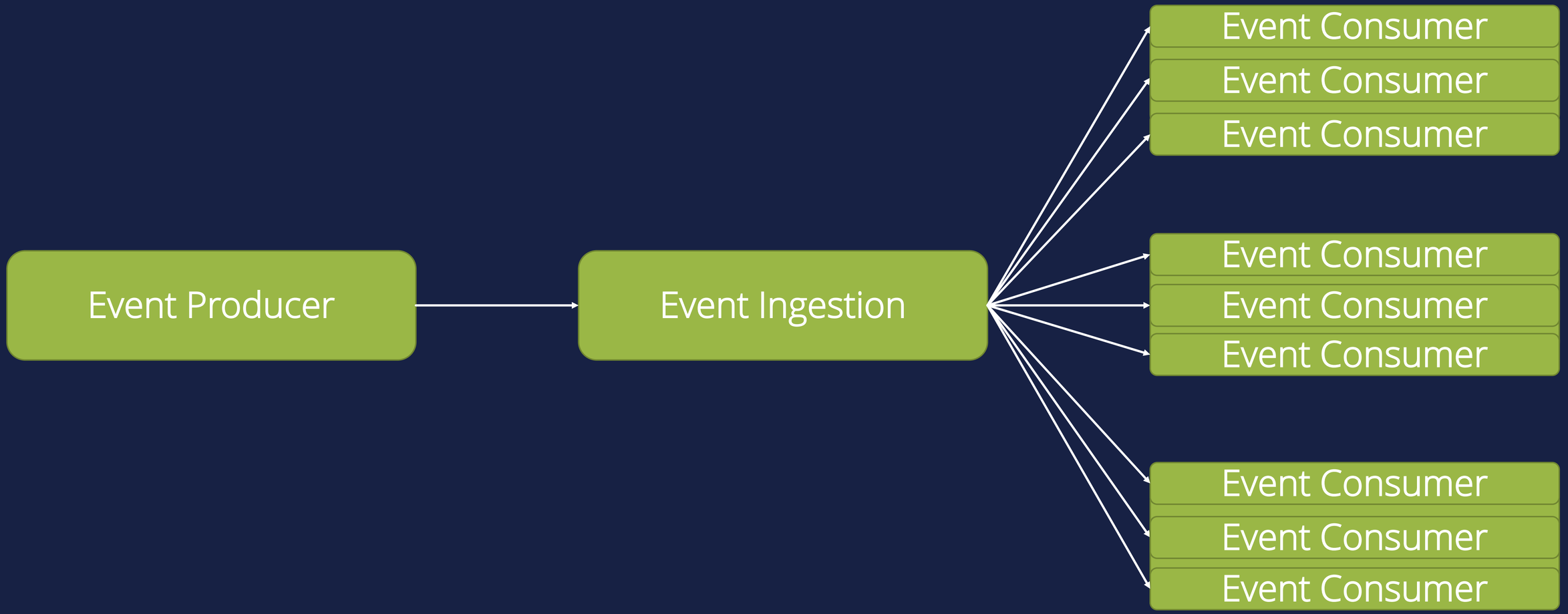
External Event Sources

Event-Driven Architecture



Multiple Consumer Instances

Event-Driven Architecture



When to use this architecture

Event-Driven Architecture

Multiple Subsystems

Multiple subsystems must process the same events.

Real-Time Processing

Real-time processing with minimum time lag.

Complex Event Processing

Complex event processing, such as pattern matching or aggregation over time windows.

High Volume/Velocity Data

High volume and high velocity of data, such as IoT.

Benefits

Event-Driven Architecture

Decoupling

Encapsulation

Responsive

Scalable/Distributed

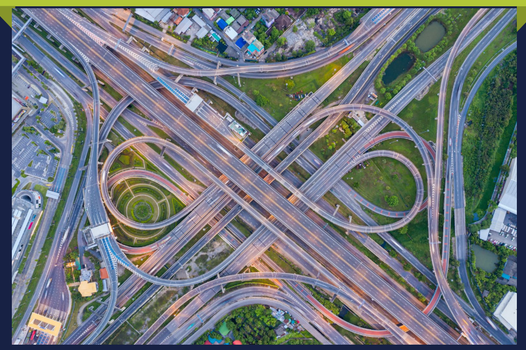
Independence

Drawbacks

Event-Driven Architecture

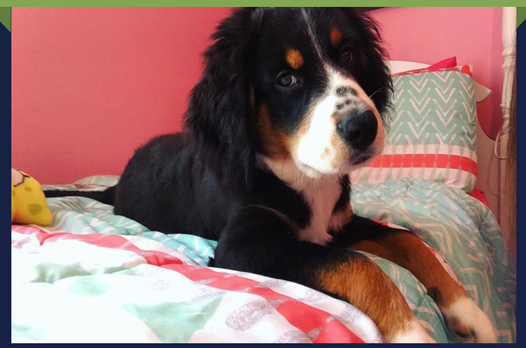
Steep Learning Curve

Complexity



Loss of Transactionality

Lineage



Challenges
Event-Driven Architecture

Guaranteed Delivery

Sequencing

Implementation Options

Event-Driven Architecture in the Cloud

Implementation Options


PieSync


TIBCO Spotfire

Amazon Kinesis

Amazon Elasticsearch Service


Google Cloud Pub/Sub

StreamSets

PubNub Data Stream


The PI System

The PI System


Confluent

HVR


Antiunity Replicate


SQLstream

IBM Streaming Analytics


Astronomer

Striim


Azure Service Bus


IoT Hubs


Azure Event Hubs

Azure Event Hubs Options

Simple, secure, and scalable real-time data ingestion

PieSync

O Spotfire

Amazon Kinesis

Amazon Elasticsearch Service

Google Cloud Pub/Sub

StreamSets

PubNub Data Stream

Fully managed, real-time data ingestion service that is simple, trusted, and scalable.

e PI System

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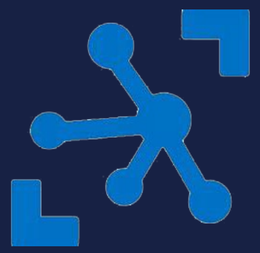
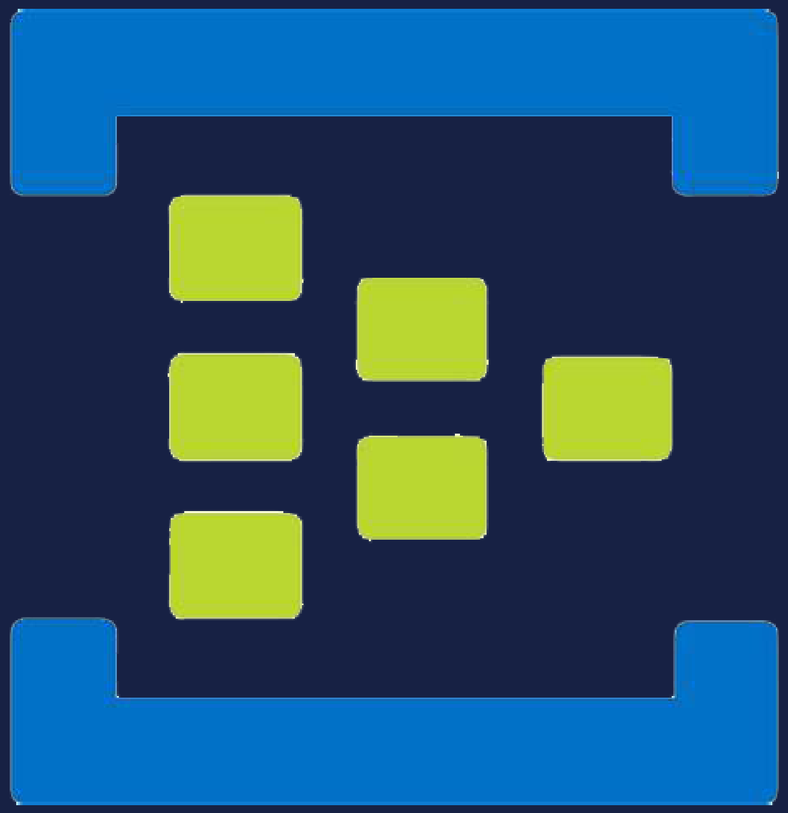


IoT Hubs

Azure Event Hubs

Why choose Event Hubs?

Azure Event Hubs



Simple

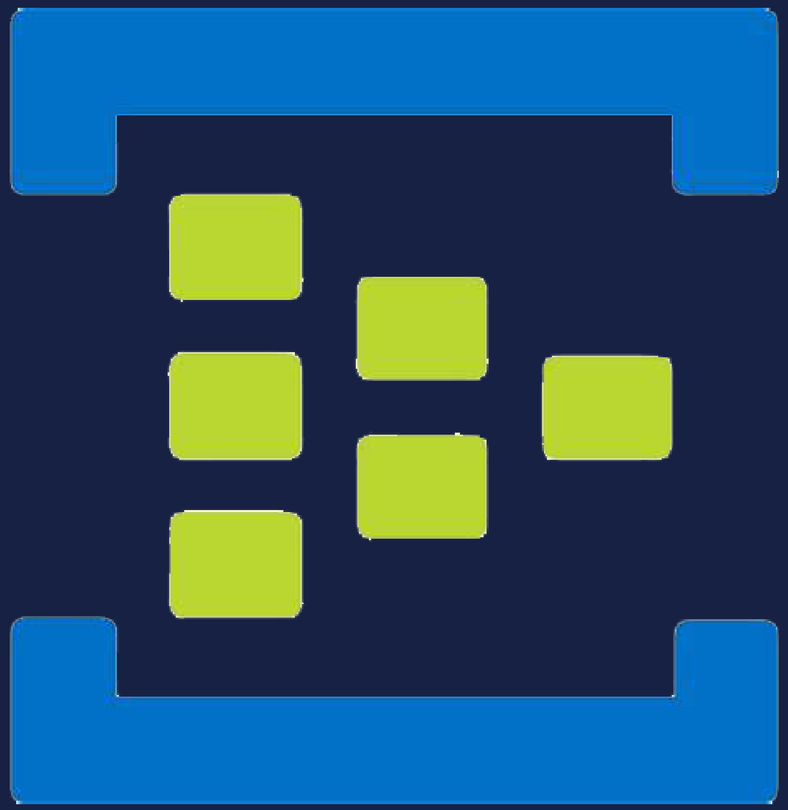
Secure

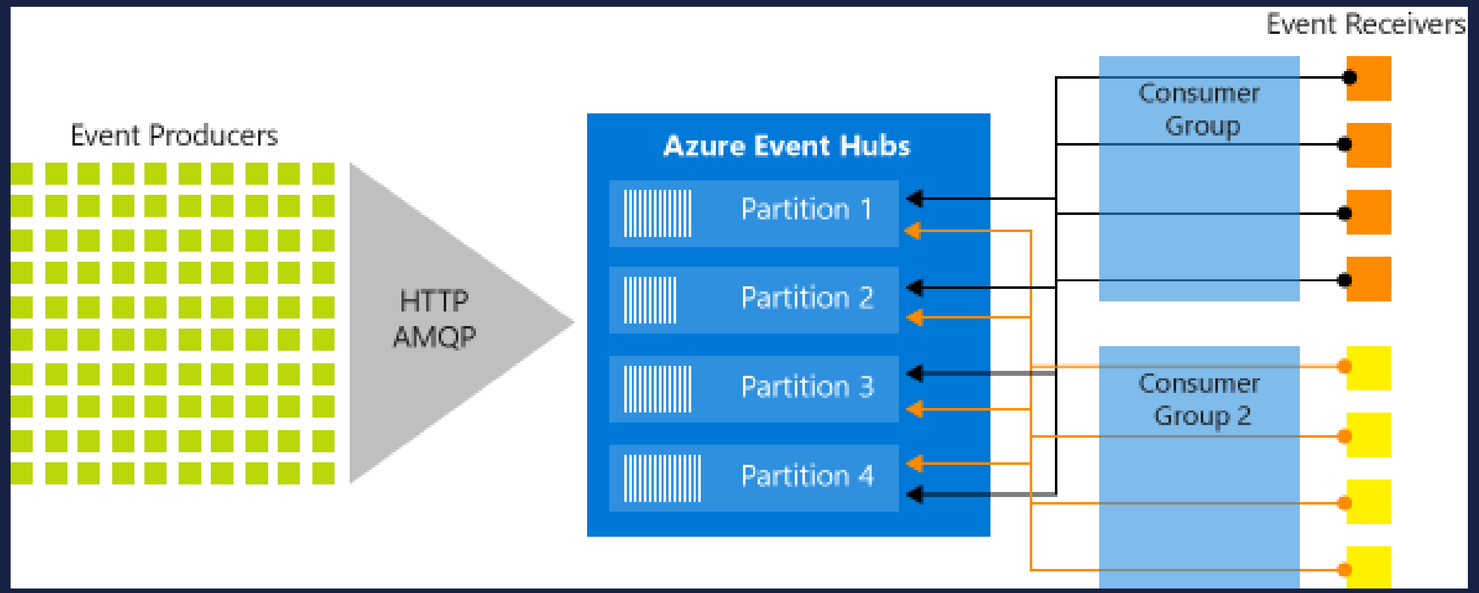
Scalable

Open

Key Architecture Components

Azure Event Hubs

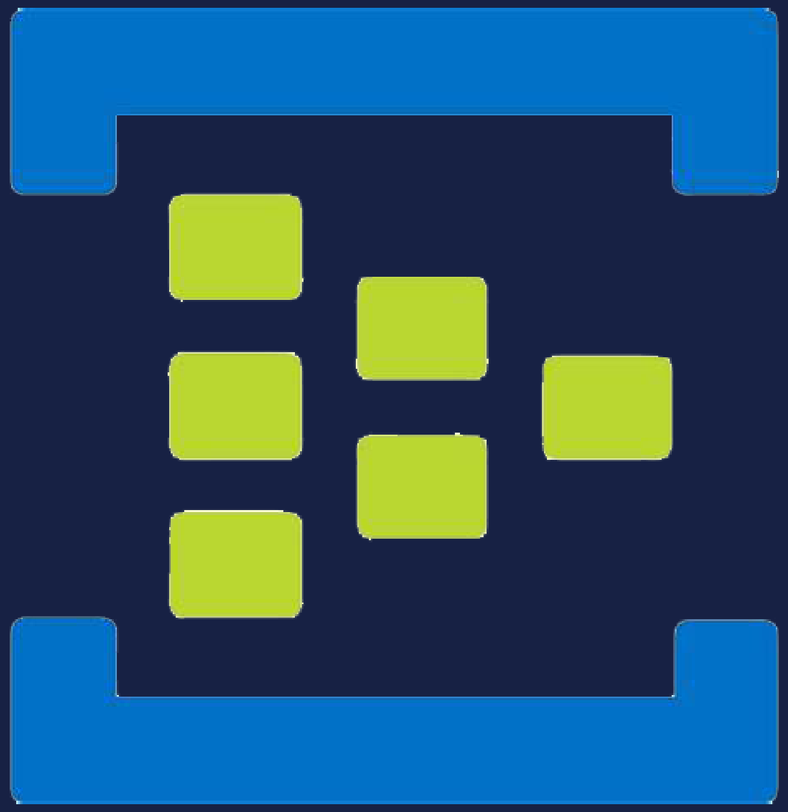


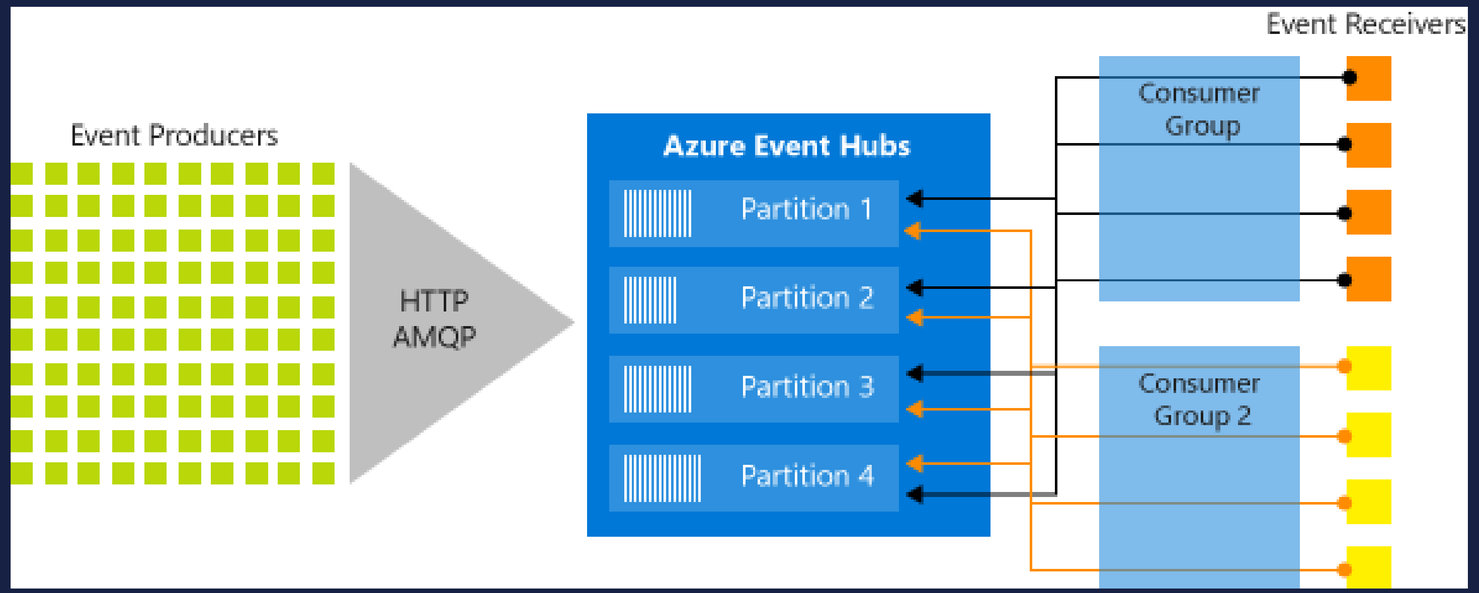


Event Producers

Key Architecture Components

Azure Event Hubs

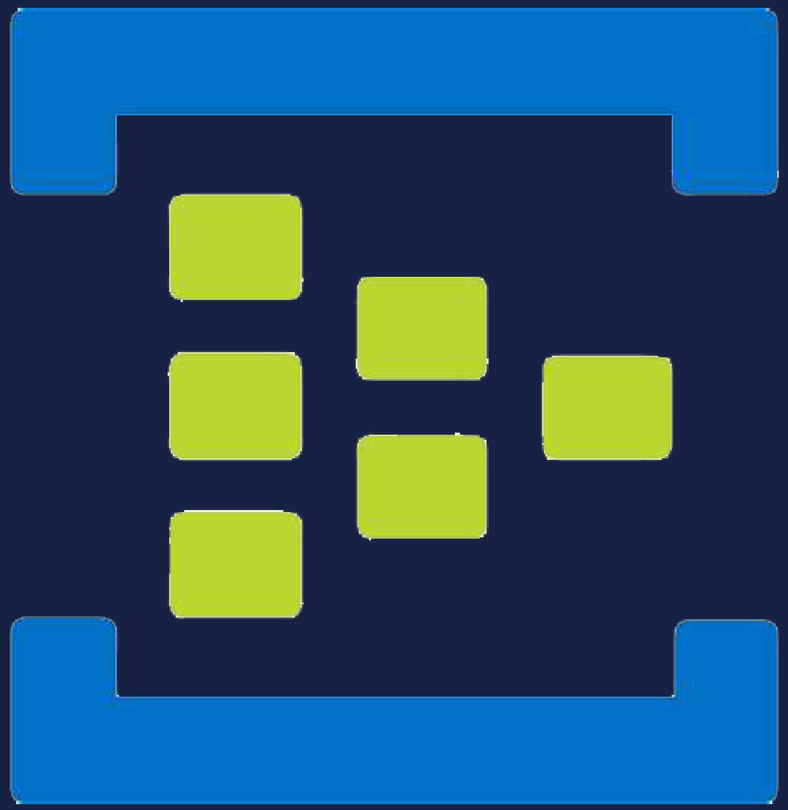


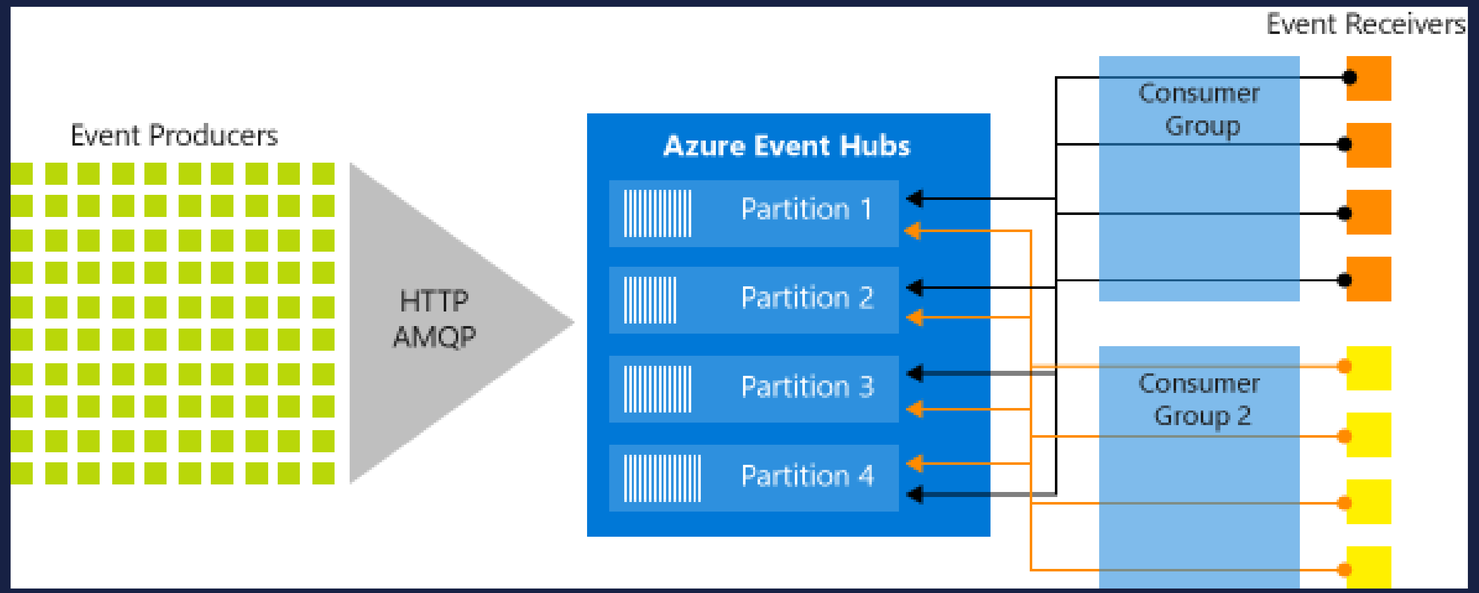


Partitions

Key Architecture Components

Azure Event Hubs

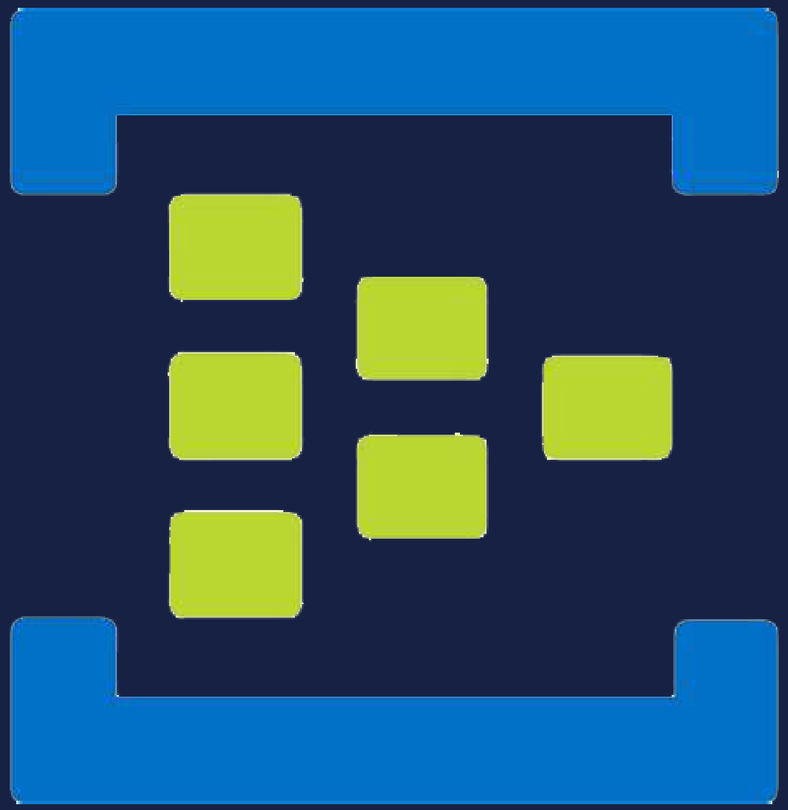


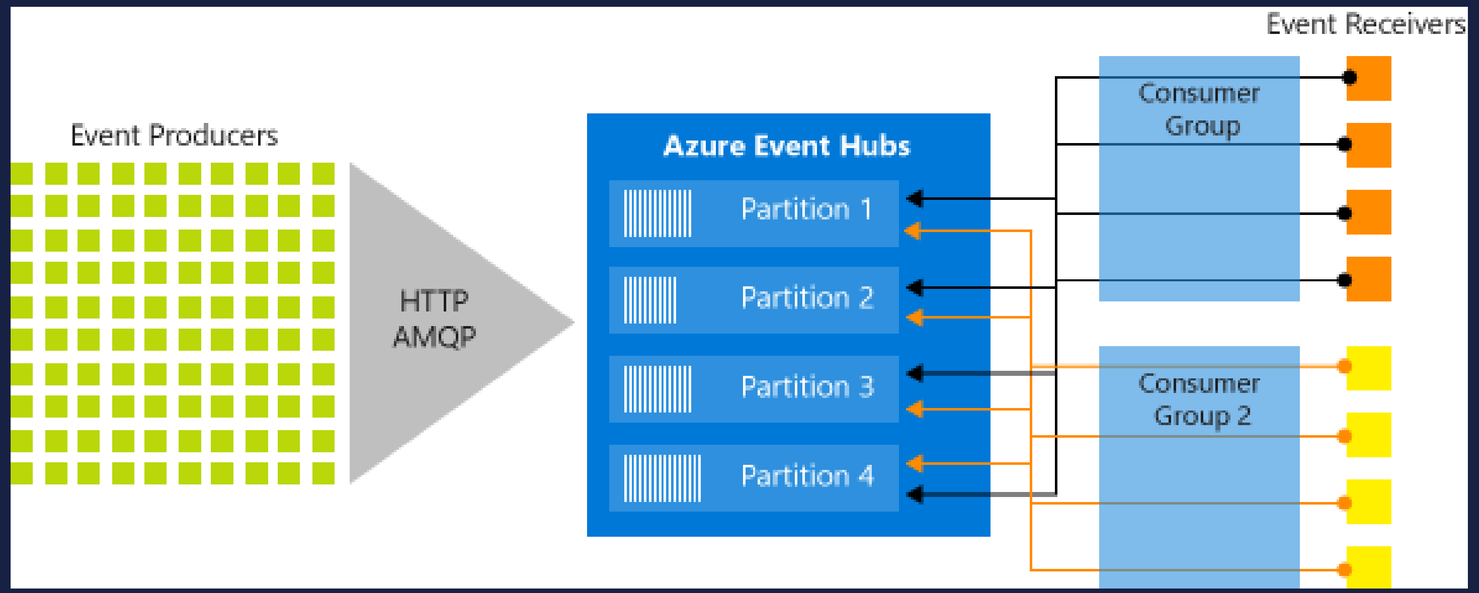


Consumer Groups

Key Architecture Components

Azure Event Hubs

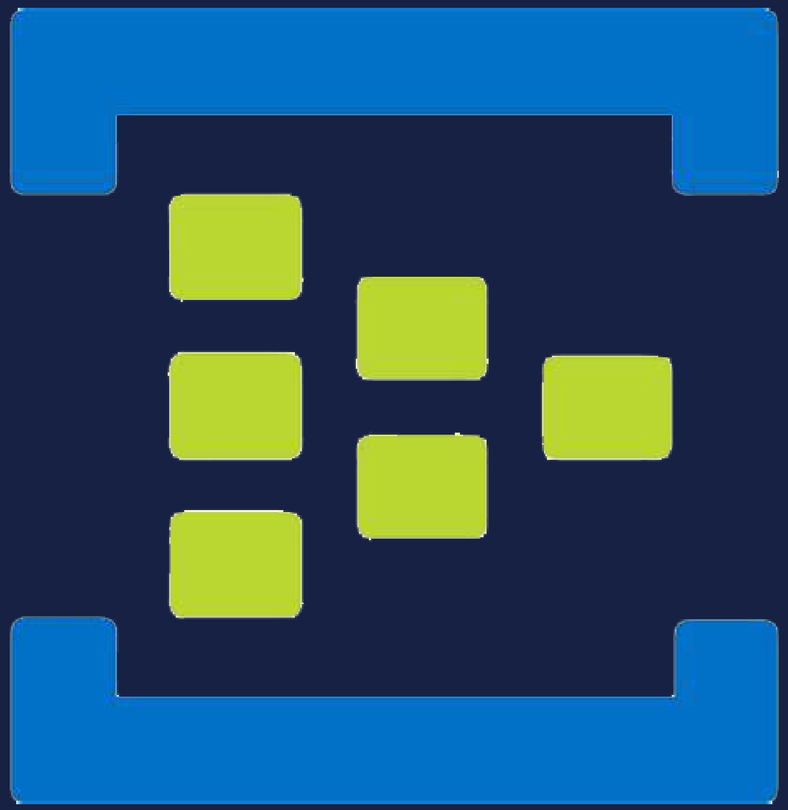


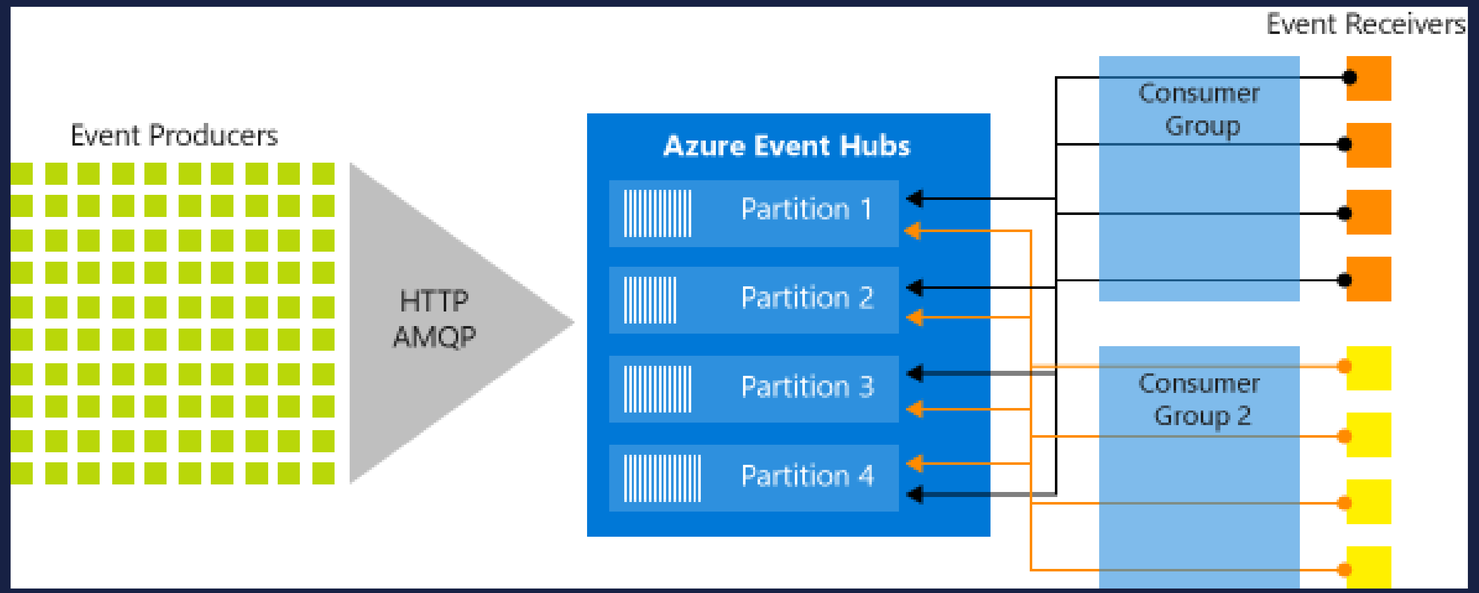


Throughput Units

Key Architecture Components

Azure Event Hubs





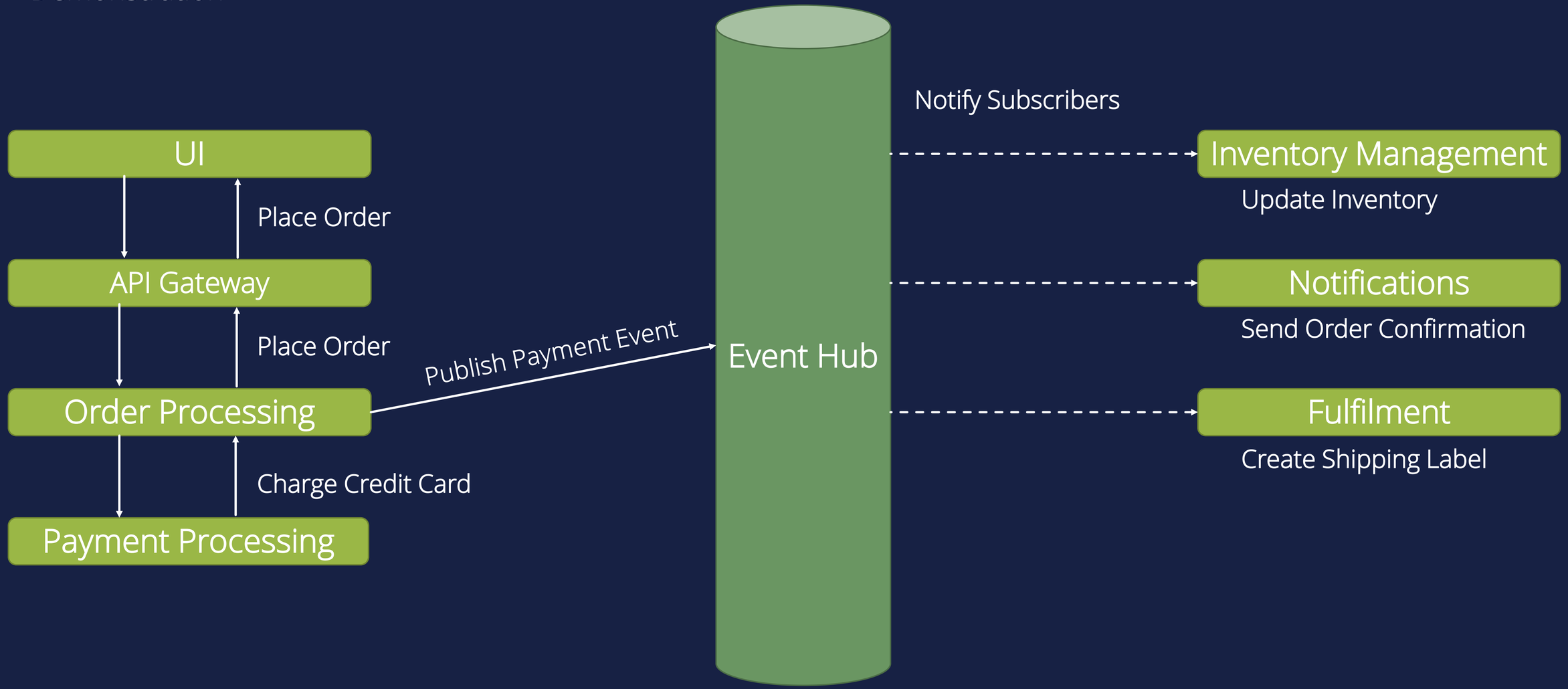
Event Receivers

Demonstration

Event-Driven Architecture in the Cloud

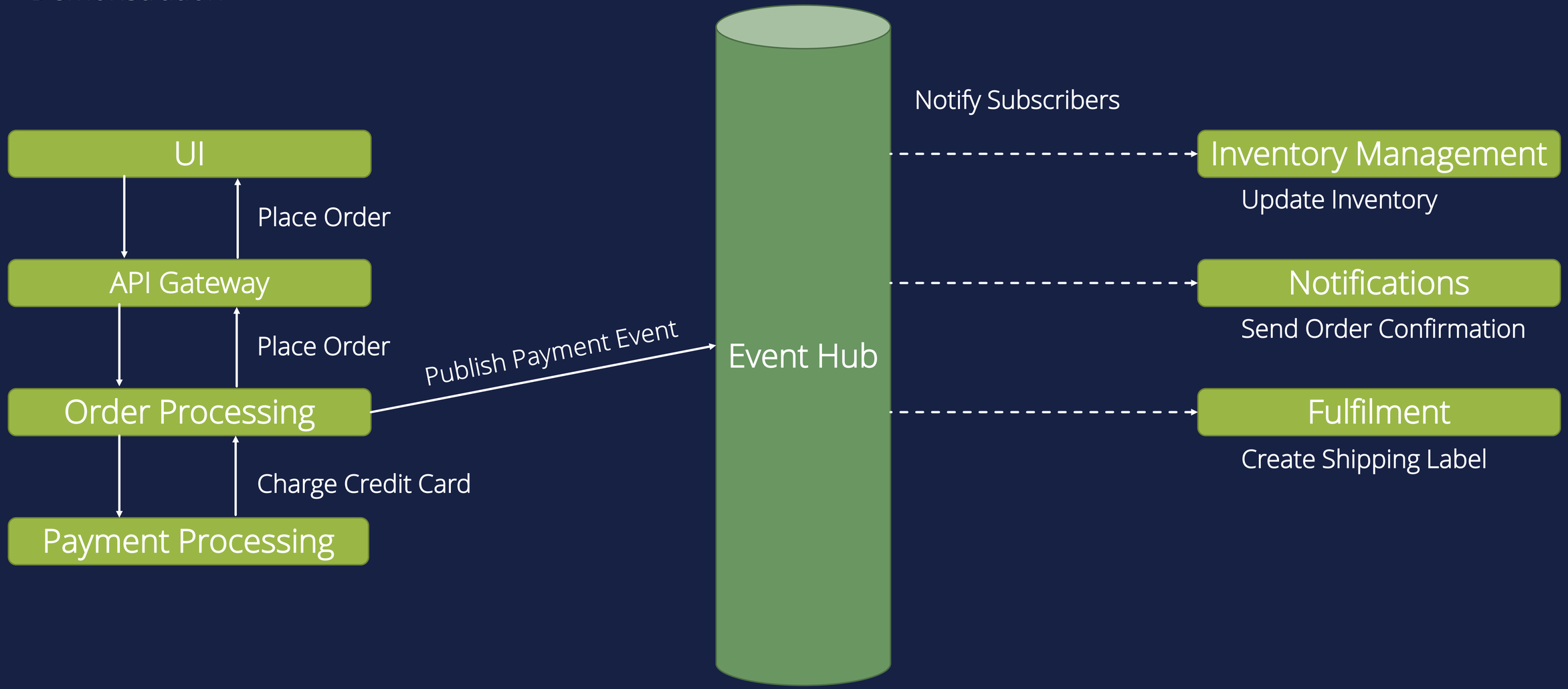
Scenario

Demonstration



Scenario

Demonstration



Summary

Event-Driven Architecture in the Cloud

Event-Driven Architecture

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- Gartner -

Strengths

- Decoupling
- Encapsulation
- Responsive
- Scalable / Distributed
- Independence

Weaknesses

- Steep Learning Curve
- Complexity
- Loss of Transactionality
- Lineage

Opportunities

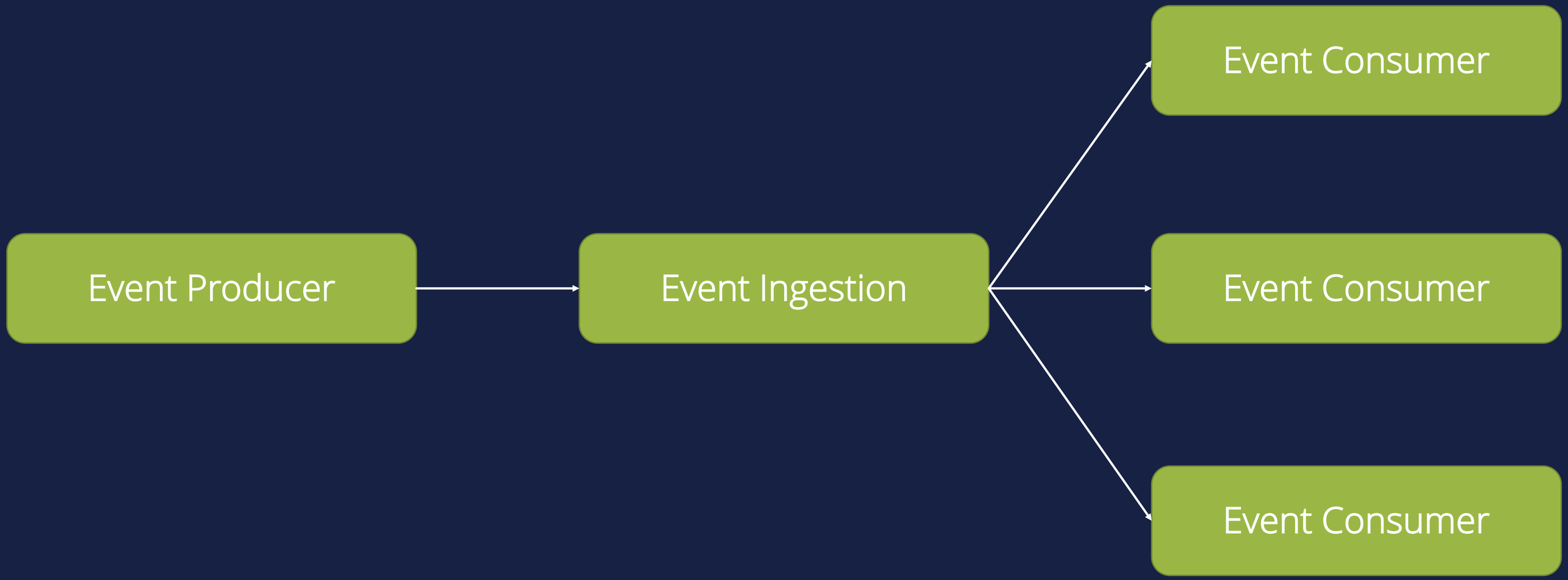
- Multiple Subsystems
- Real-Time Processing
- Complex Event Processing
- High Volume / Velocity Data

Threats

- No Guaranteed Delivery
- Potential Sequencing Issues

Event-Driven Architecture

Summary



Azure Event Hubs
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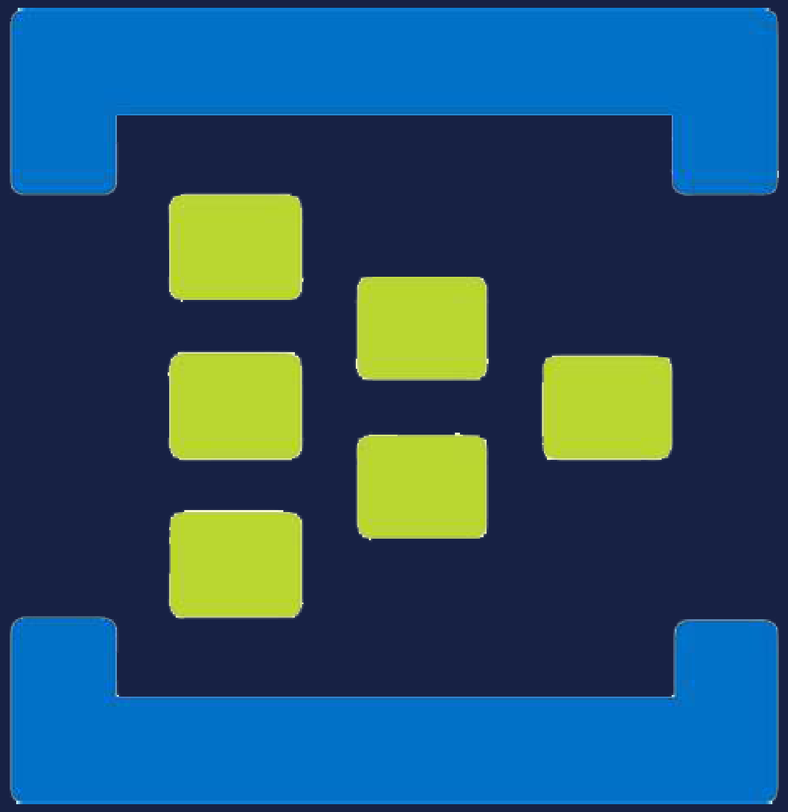

Fully managed, real-time data ingestion service that is simple, trusted, and scalable.

Simple | Secure | Scalable | Open

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