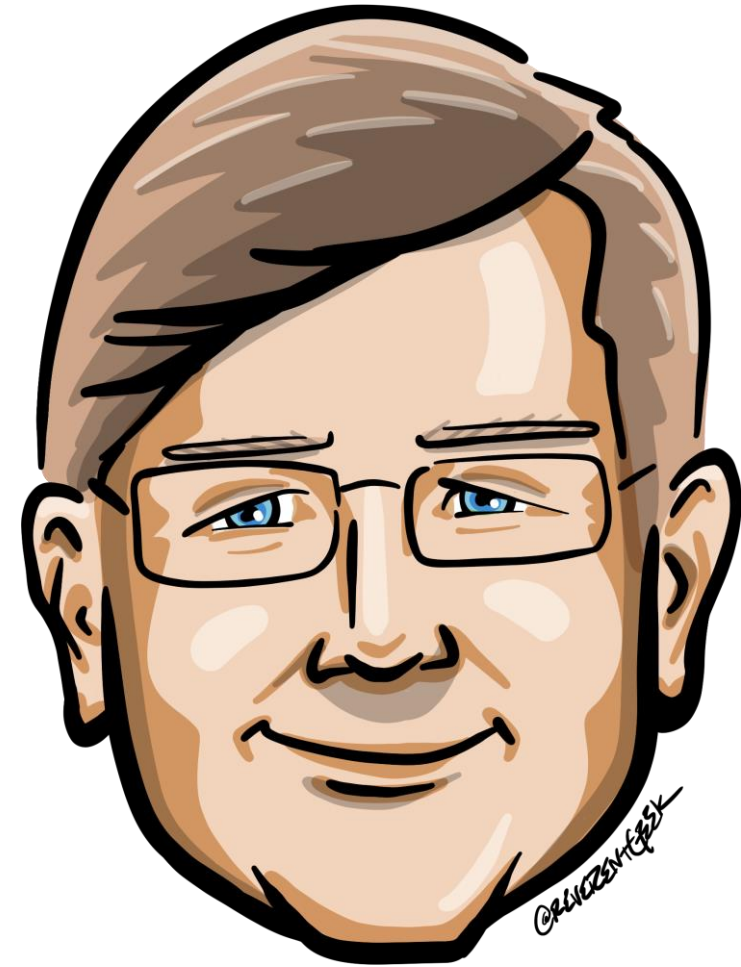




Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

Advanced Serverless Workshop

Who is Chad Green?



Agenda

- Introduction to Serverless Computing
- Serverless Architecture Patterns
- Cloud Design Patterns
- Software Design Patterns
- Microsoft Azure Serverless Services
- Overview of Serverless Solutions Built in Azure
- Interactive Lab: Designing a Serverless Architecture
- Demonstration of a Serverless Solution Built using Azure
- Conclusion and Q&A

Introduction to Serverless Computing

Azure Serverless Solutions Demystified: Learn Build, and Scale with Ease!

What is Serverless Computing

IaaS

Infrastructure as a Service

PaaS

Platform as a Service

FaaS

Function as a Service

What is Serverless Computing

IaaS

Infrastructure as a Service

PaaS

Platform as a Service

Serverless

Serverless Benefits

Scalability

Cost-Efficiency

**Developer
Productivity**

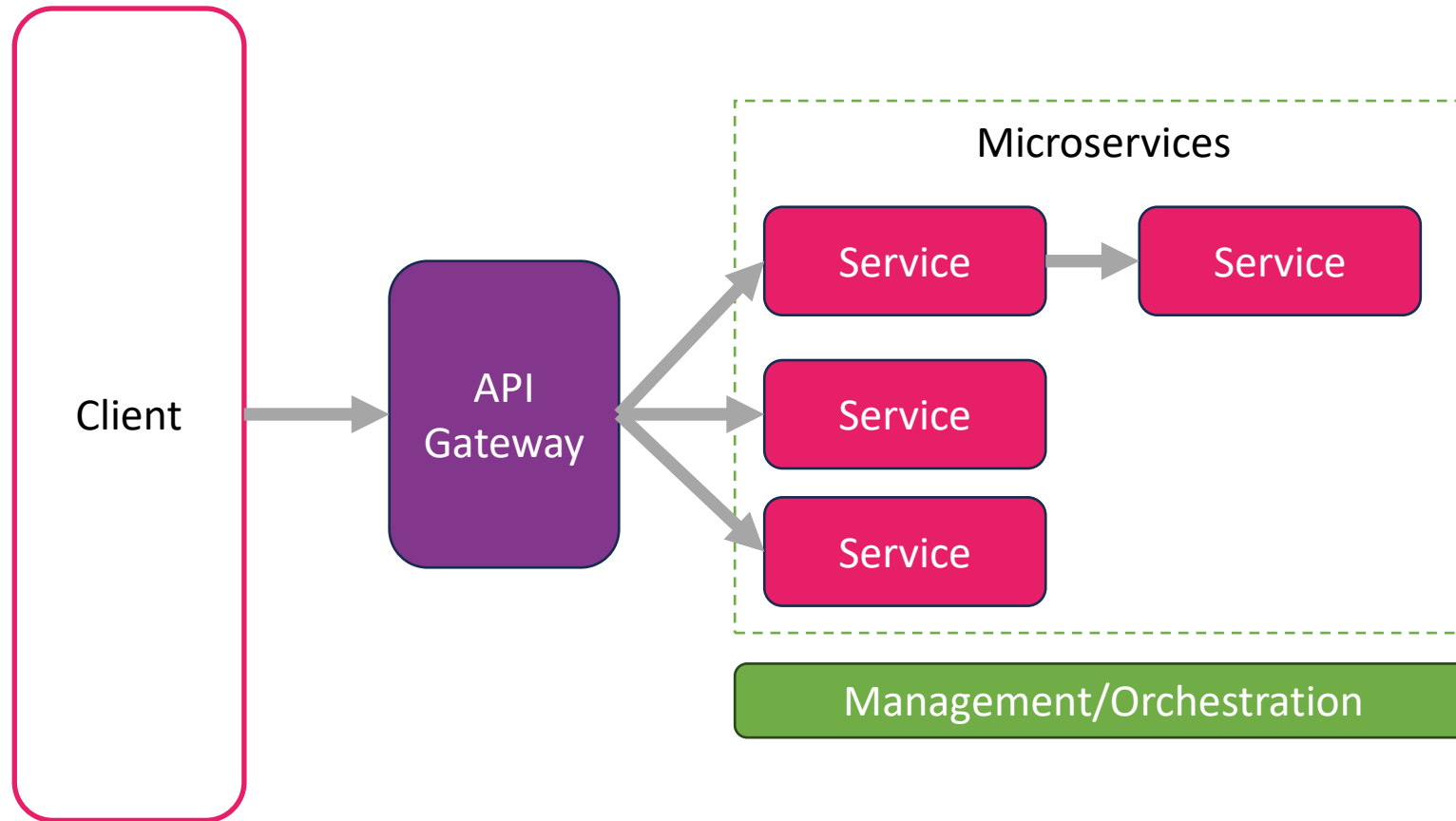
High Availability

**Rapid
Development**

Serverless Architecture Styles

Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

Microservices



Benefits of Microservices

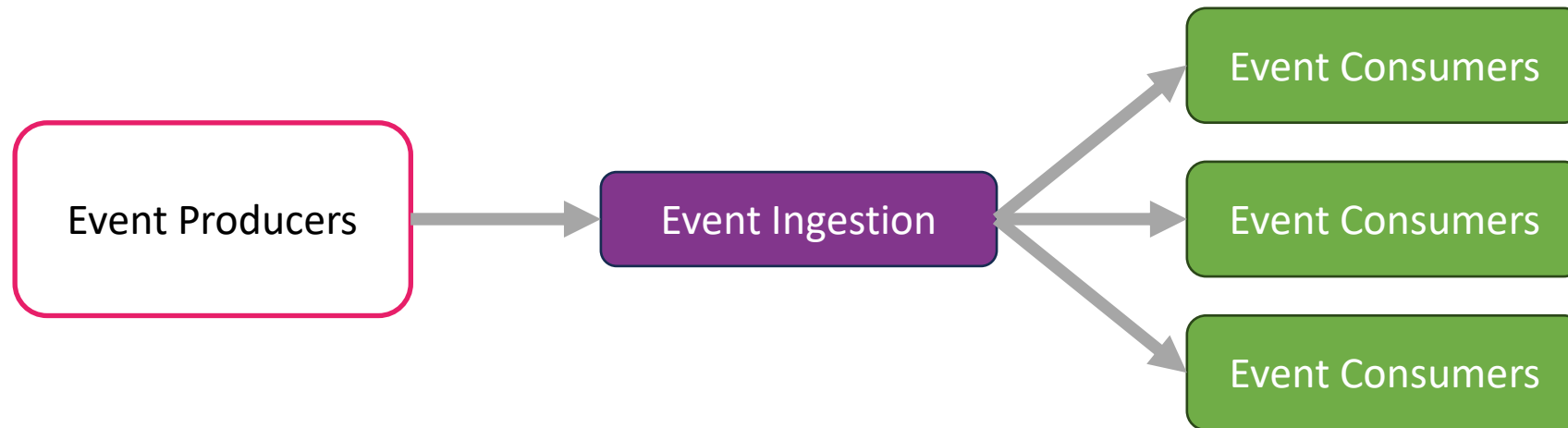
Flexibility

Scalability

Resilience

Agility

Event-Driven Architecture



Benefits of Event-Driven Architecture

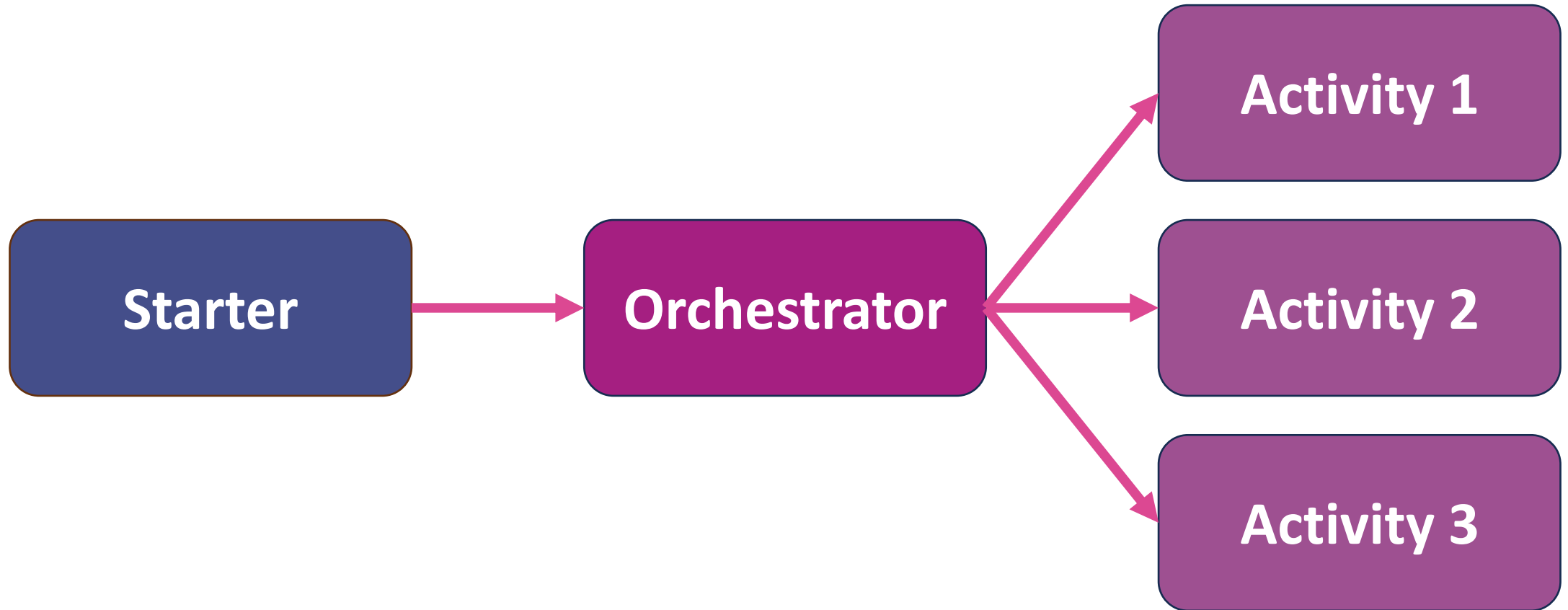
Scalability

Flexibility

Resilience

**Real-Time
Processing**

Workflow Orchestration



Benefits of Workflow Orchestration

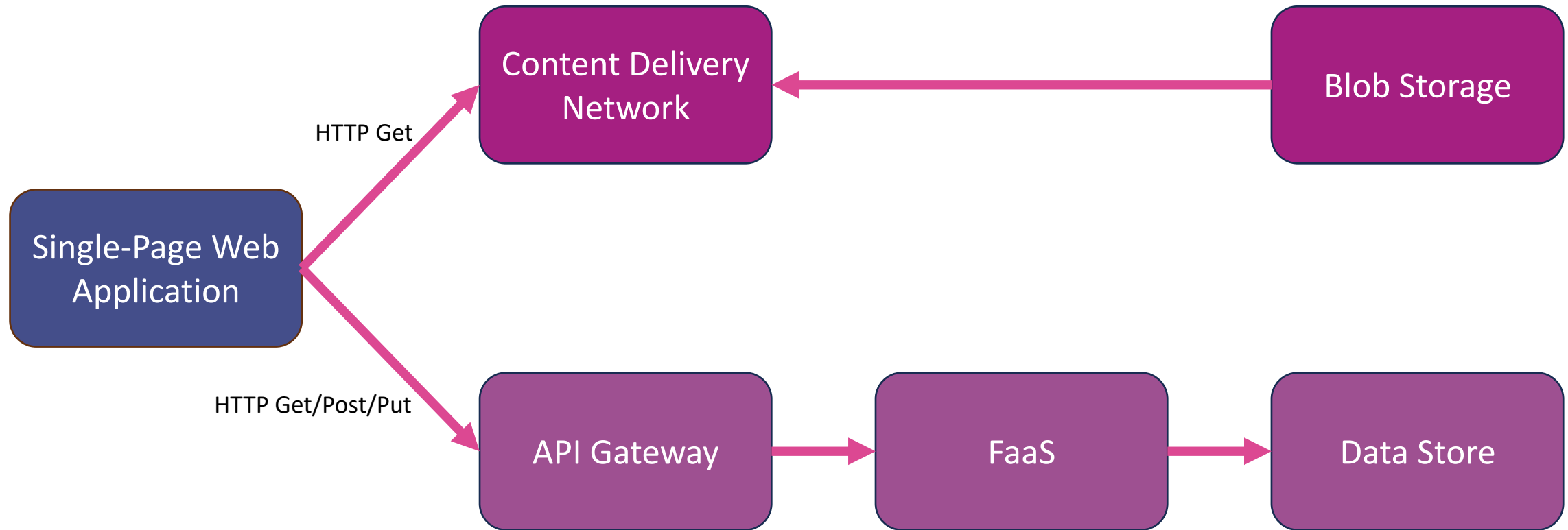
Simplified Business Processes

Scalability

Flexibility

Reliability

Scalable Web Applications



Benefits of Scalable Web Apps

**Automatic
Scaling**

Global Reach

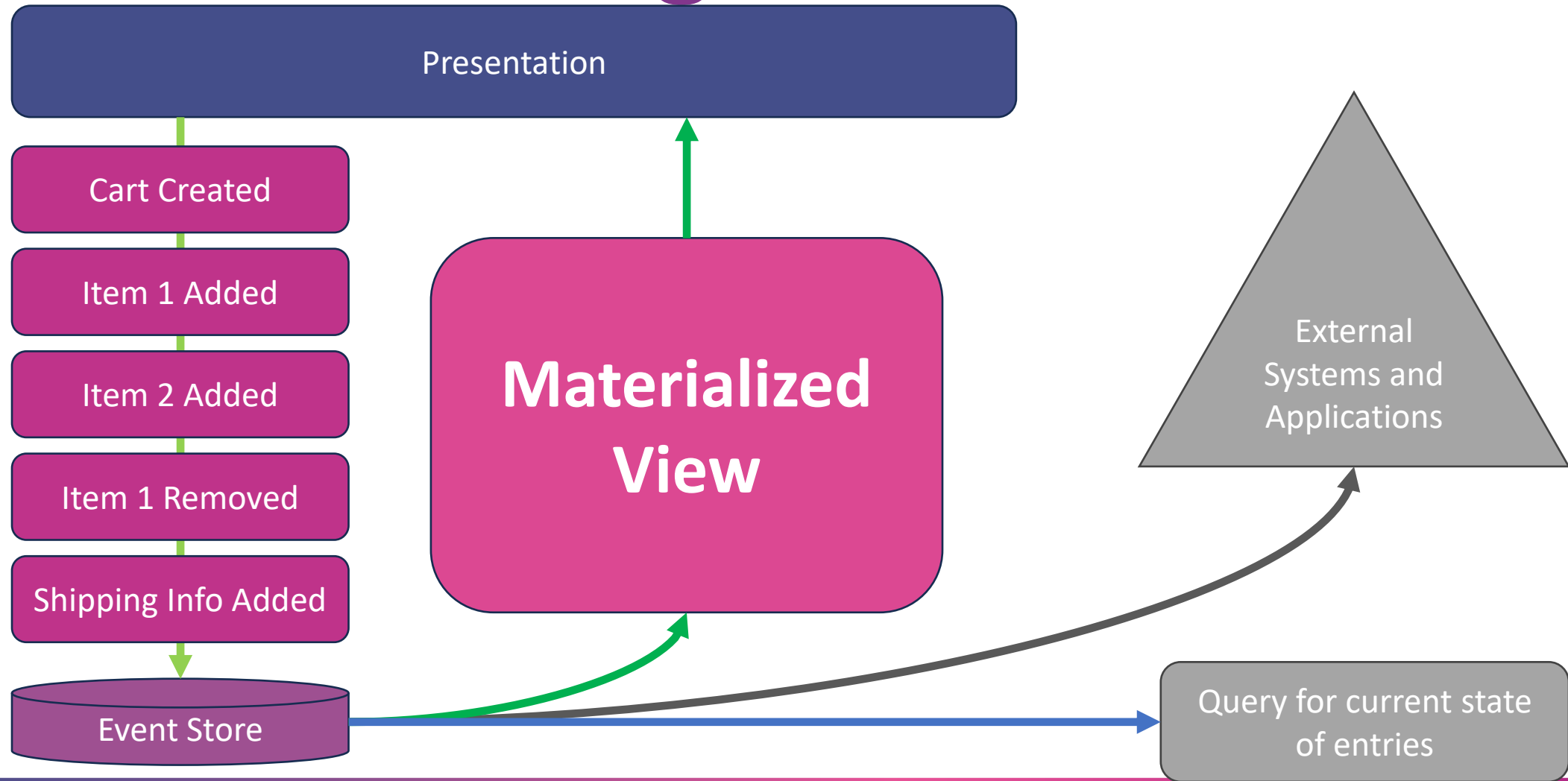
**Simplified
Operation**

Cost Efficiency

Cloud Design Patterns

Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

Event Sourcing



Benefits of Event Sourcing

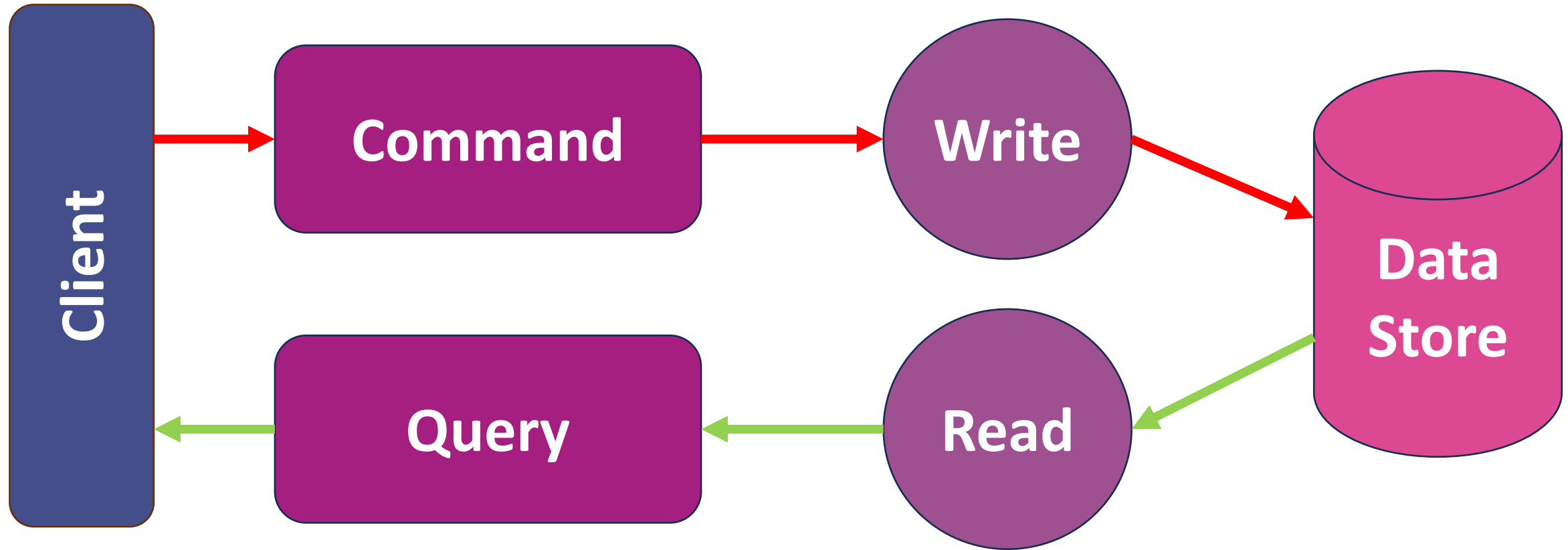
Immutable Audit Trail

Temporal Queries

Scalability and Reliability

Flexibility and Extensibility

Command Query Responsibility Segregation (CQRS)



Benefits of CQRS

Scalability

Performance

Flexibility

Maintainability

Retry



Benefits of Retry

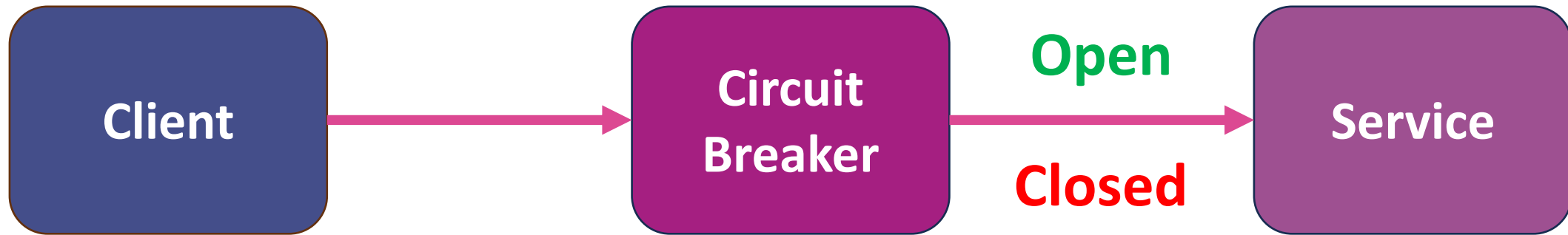
Improved Reliability

Fault Tolerance

**Reduced Operational
Overhead**

**Enhanced User
Experience**

Circuit Breaker



Benefits of Circuit Breaker

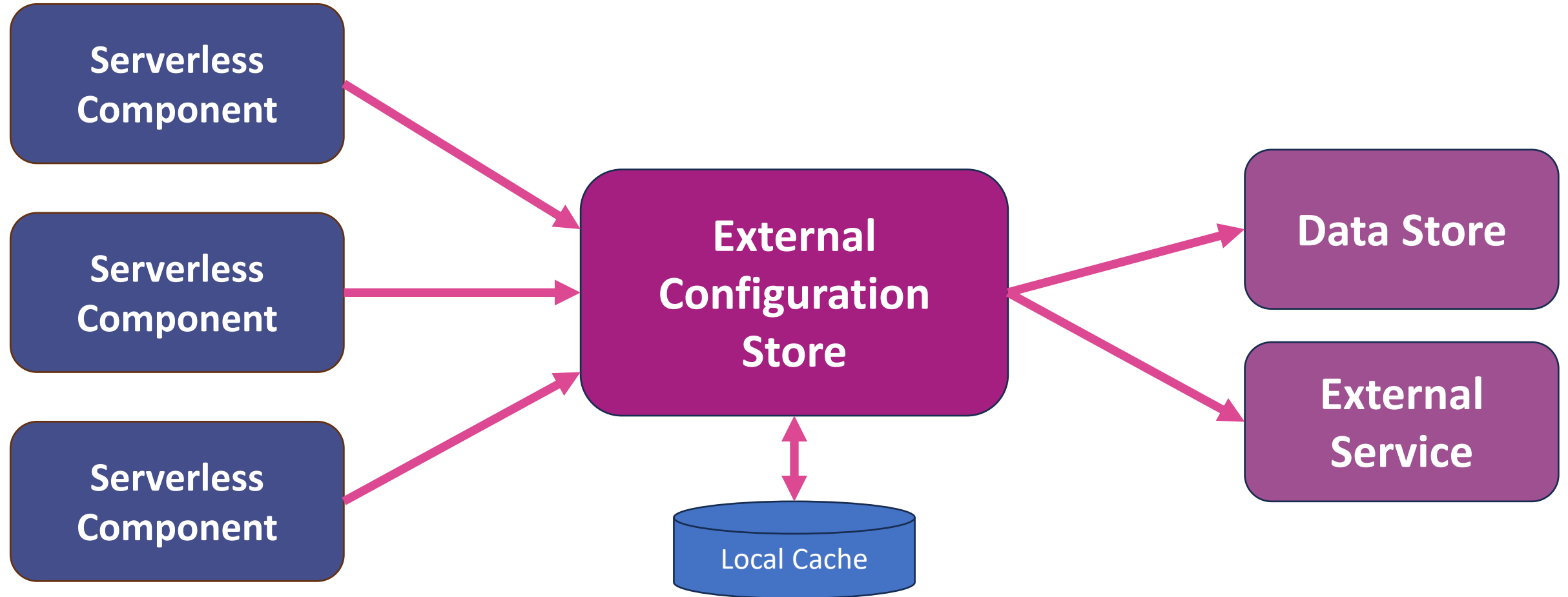
Fault Tolerance

**Load
Management**

**Improved User
Experience**

**Operational
Insights**

External Configuration



Benefits of External Configuration

**Centralized
Management**

**Dynamic Configuration
Updates**

Enhanced Security

**Scalability and
Performance**

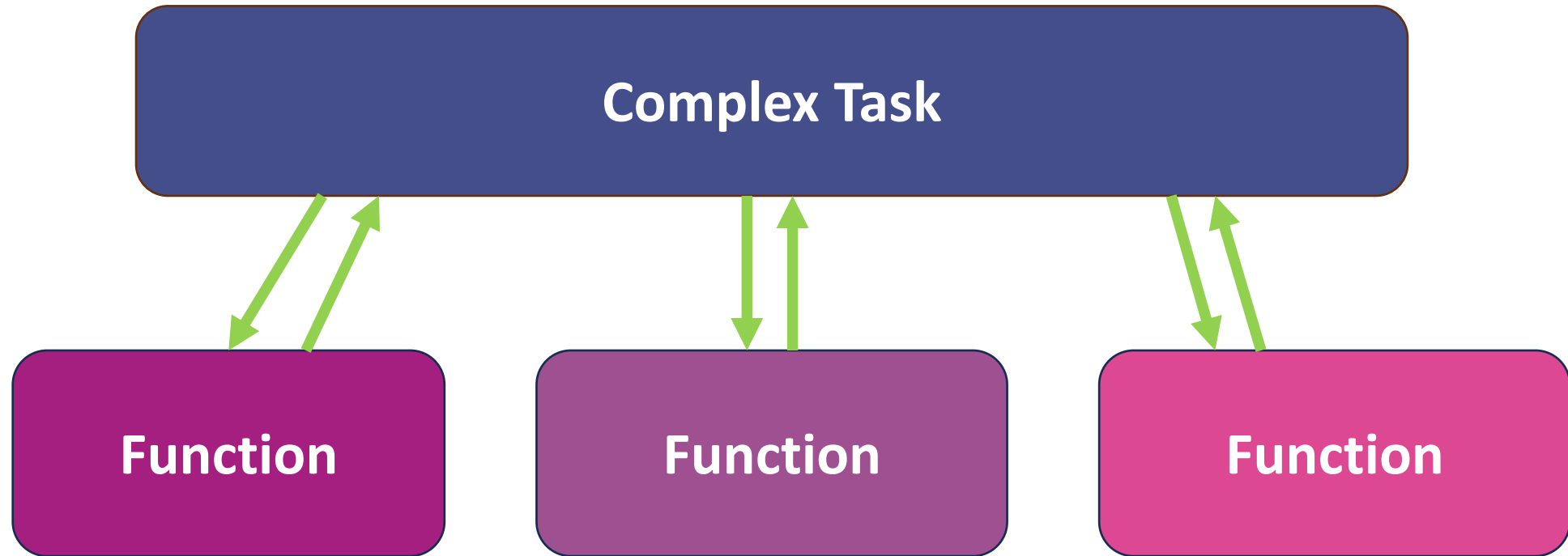
Other Cloud Design Patterns

- Ambassador
- Anti-Corruption Layer
- Asynchronous Request-Retry
- Backends for Frontends
- Bulkhead
- Cache-Aside
- Choreography
- Claim Check
- Compensating Transactions
- Competing Consumers
- Compute Resource Consolidation
- Deployment Stamps
- Edge Workload Configuration
- Federated Identity
- Gatekeeper
- Gateway Aggregation
- Gateway Offloading
- Gateway Routing
- Geode
- Health Endpoint Monitoring
- Index Table
- Leader Execution
- Materialized View
- Pipes and Filters
- Priority Queue
- Publisher/Subscriber
- Queue-Based Load Balancing
- Rate Limiting
- Saga
- Scheduler Agent Supervisor
- Sequential Convoy
- Sharding
- Static Content Hosting
- Stranger Fig
- Throttling
- Valet Key

Software Design Patterns

Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

Function Composition



Benefits of Function Composition

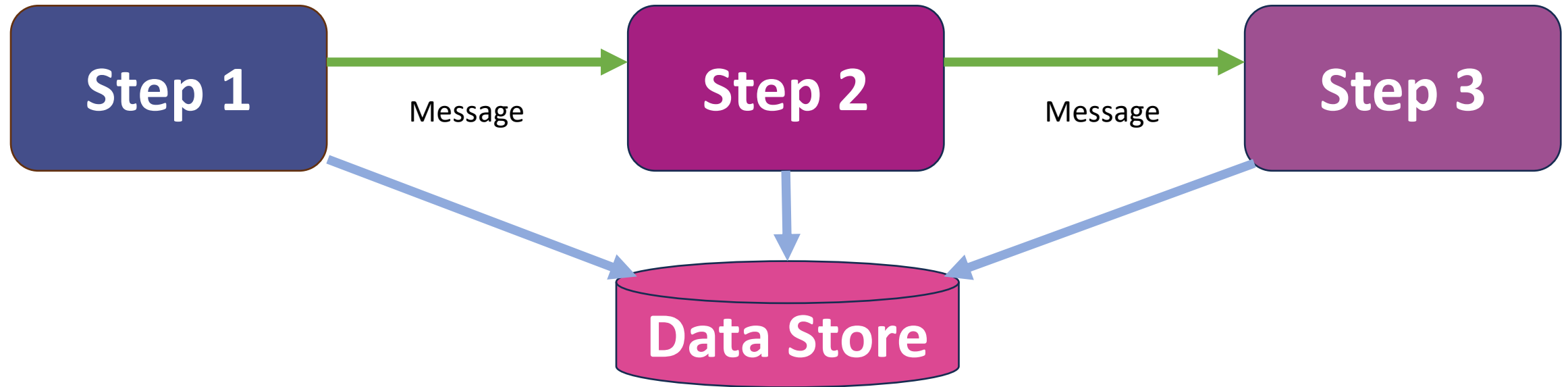
Modularity

Scalability

Flexibility

Testability

Saga Pattern



Benefits of Saga Pattern

**Transactional
Integrity**

Fault Tolerance

Scalability

Flexibility

Event Driven Pattern



Benefits of Event-Driven Pattern

Loose Coupling

Scalability

Resilience

Flexibility

Benefits of Asynchronous Messaging

Loose Coupling

Scalability

Reliability

Flexibility

Microsoft Azure Serverless Services

Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

Categories

Compute

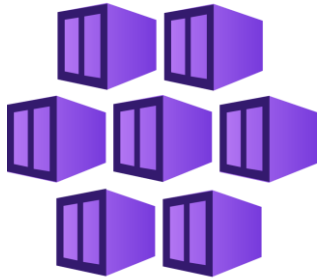
**Workflow and
Integration**

**Data Processing and
Analytics**

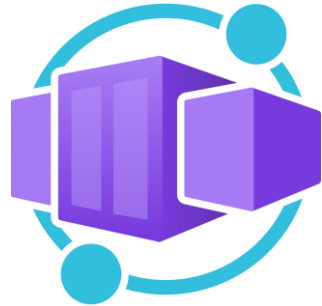
Messaging

Data Storage

Compute



Azure Kubernetes Service



Azure Container Apps

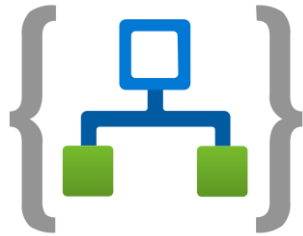


Azure App Service



Azure Functions

Workflow and Integration



Azure Logic Apps

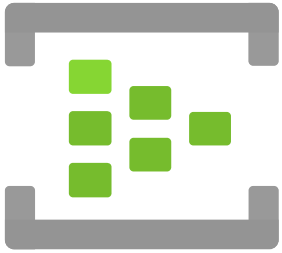


API Management



Azure Event Grid

Data Processing and Analytics



Azure Event Hubs



Azure Stream Analytics



Azure Synapse Analytics

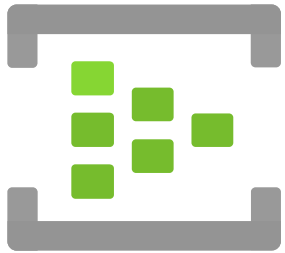


Azure Data Lake Analytics

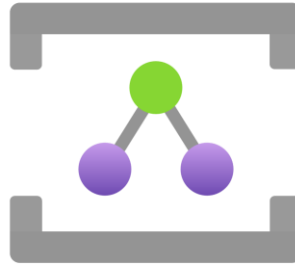
Messaging



Azure Service Bus



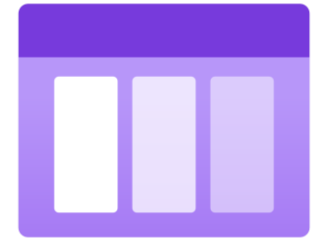
Azure Event Hubs



Azure Relays



Azure Event Grid



**Azure Storage
Queues**

Data Storage



Azure SQL Database



Azure Cosmos DB



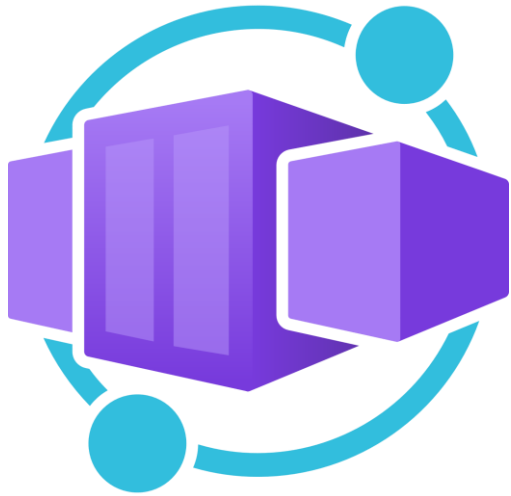
Azure Storage

Azure Functions



- Asynchronous Request-Reply
- Backends for Frontends
- Compute Resource Consolidation
- Gatekeeper
- Messaging Bridge
- Pipes and Filters
- Publisher/Subscriber
- Queue-Based Load Balancing
- Retry
- Scheduler Agent Supervisor
- Throttling

Azure Container Apps



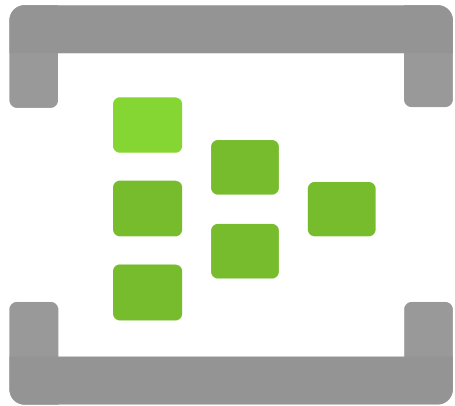
- Ambassador
- Backends for Frontends
- Bulkhead
- Circuit Breaker
- Gateway
- Gateway Aggregation
- Gateway Offloading
- Gateway Routing
- Pipes and Filters
- Sidecar
- Stranger Fig

Azure Service Bus



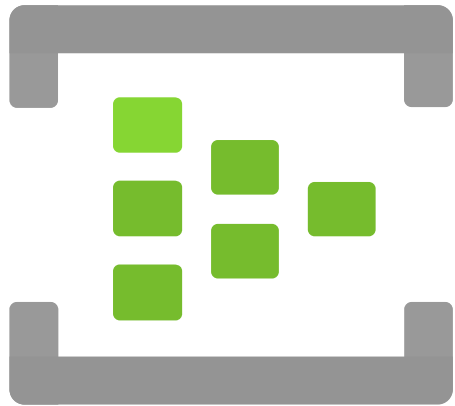
- Asynchronous Request-Reply
- Competing Consumers
- Event Sourcing
- Messaging Bridge
- Publisher/Subscriber
- Queue-Based Load Leveling
- Retry
- Saga
- Sequential Convoy

Azure Event Hubs



- Event Sourcing
- Messaging Bridge
- Publisher/Subscriber
- Queue-Based Load Leveling

Azure Event Grid



- Asynchronous Request-Reply
- Event Sourcing
- Messaging Bridge
- Publisher/Subscriber

Azure API Management

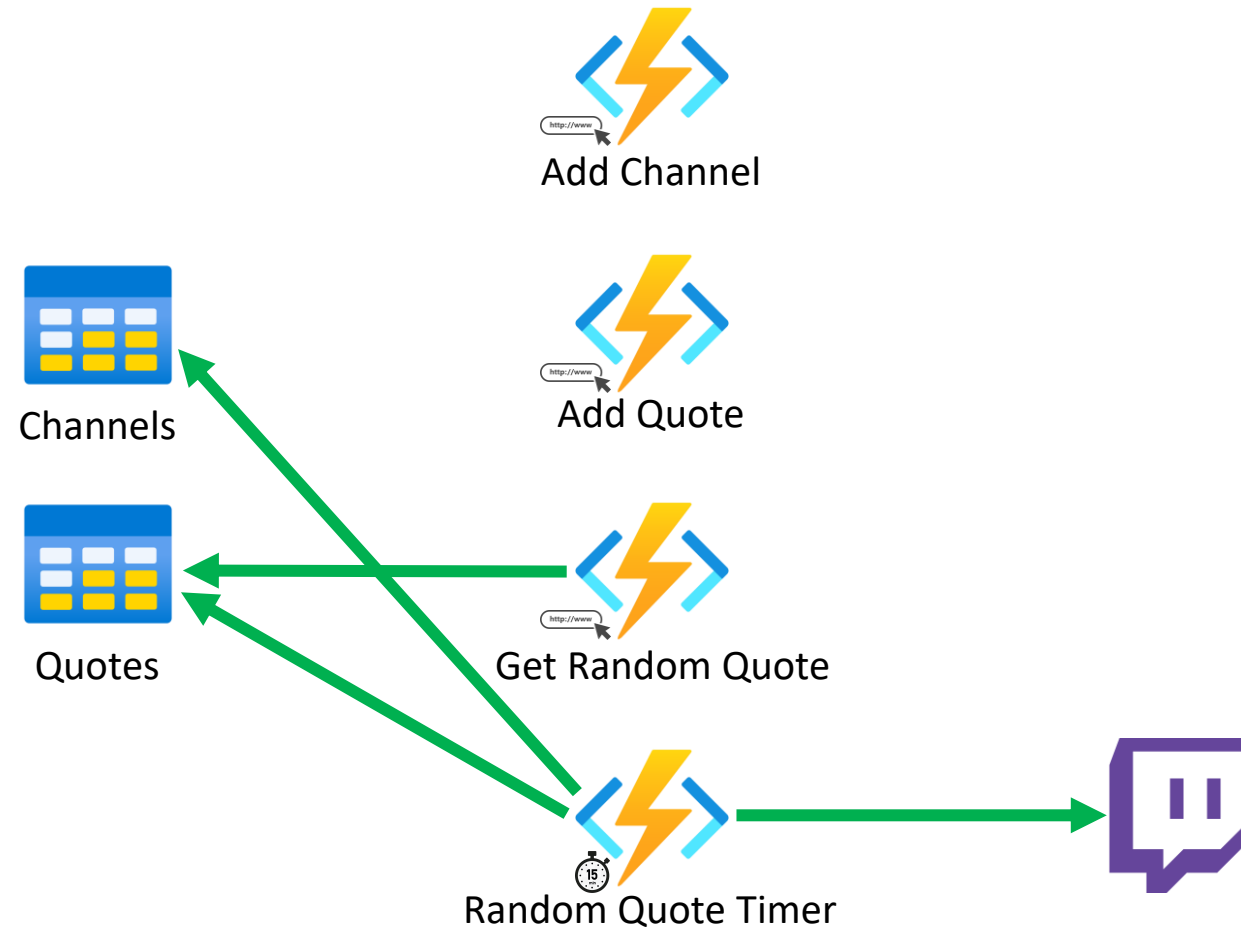


- Ambassador
- Anti-Corruption Layer
- Backends for Frontends
- Gatekeeper
- Gateway Aggregation
- Gateway Offloading
- Gateway Routing
- Pipe and Filters
- Static Content Hosting
- Valet Key

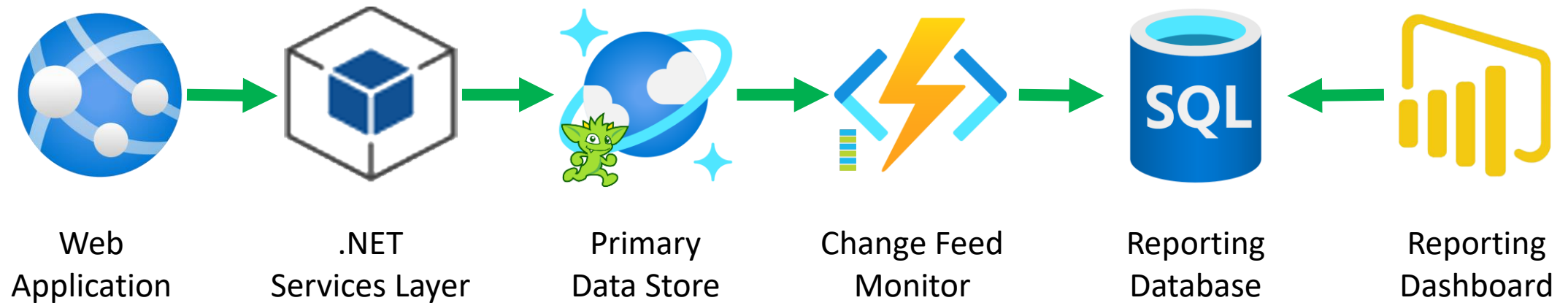
Implemented Azure Solutions

Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

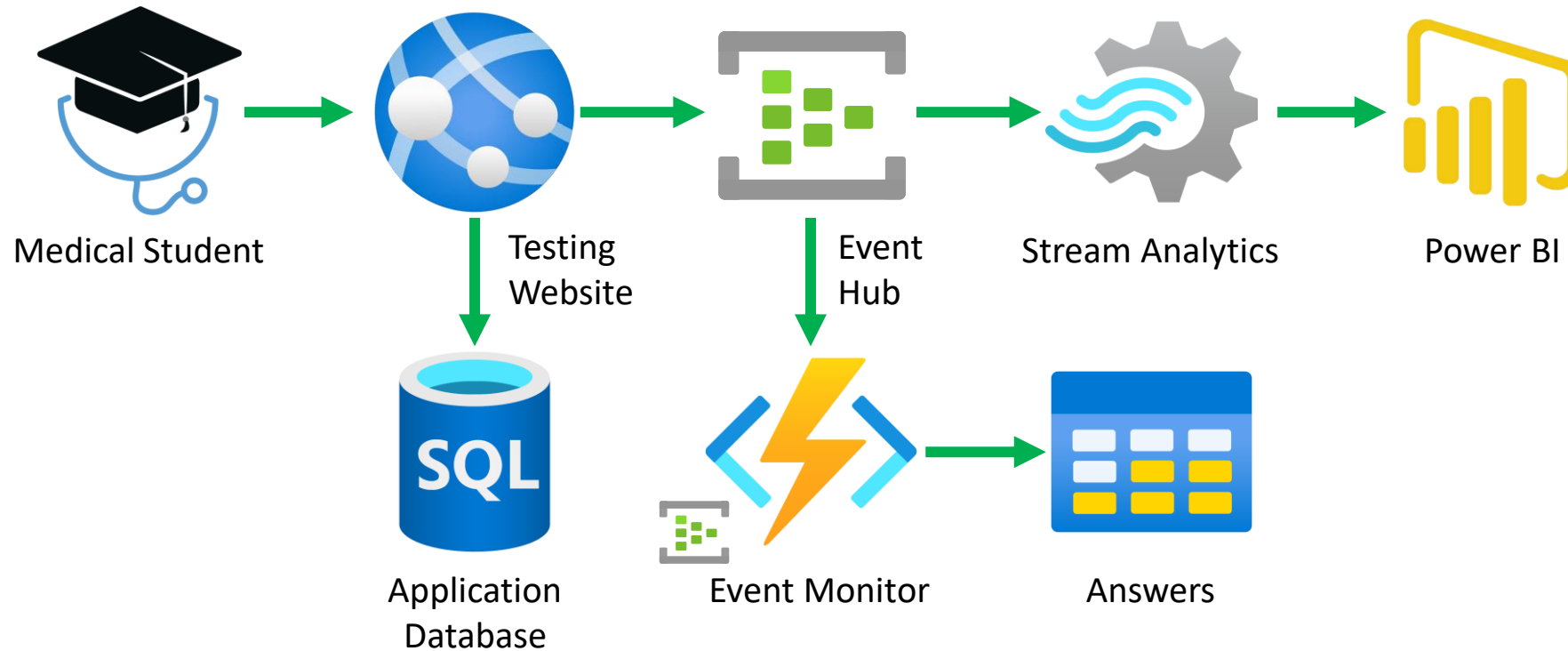
Random Quote Generator



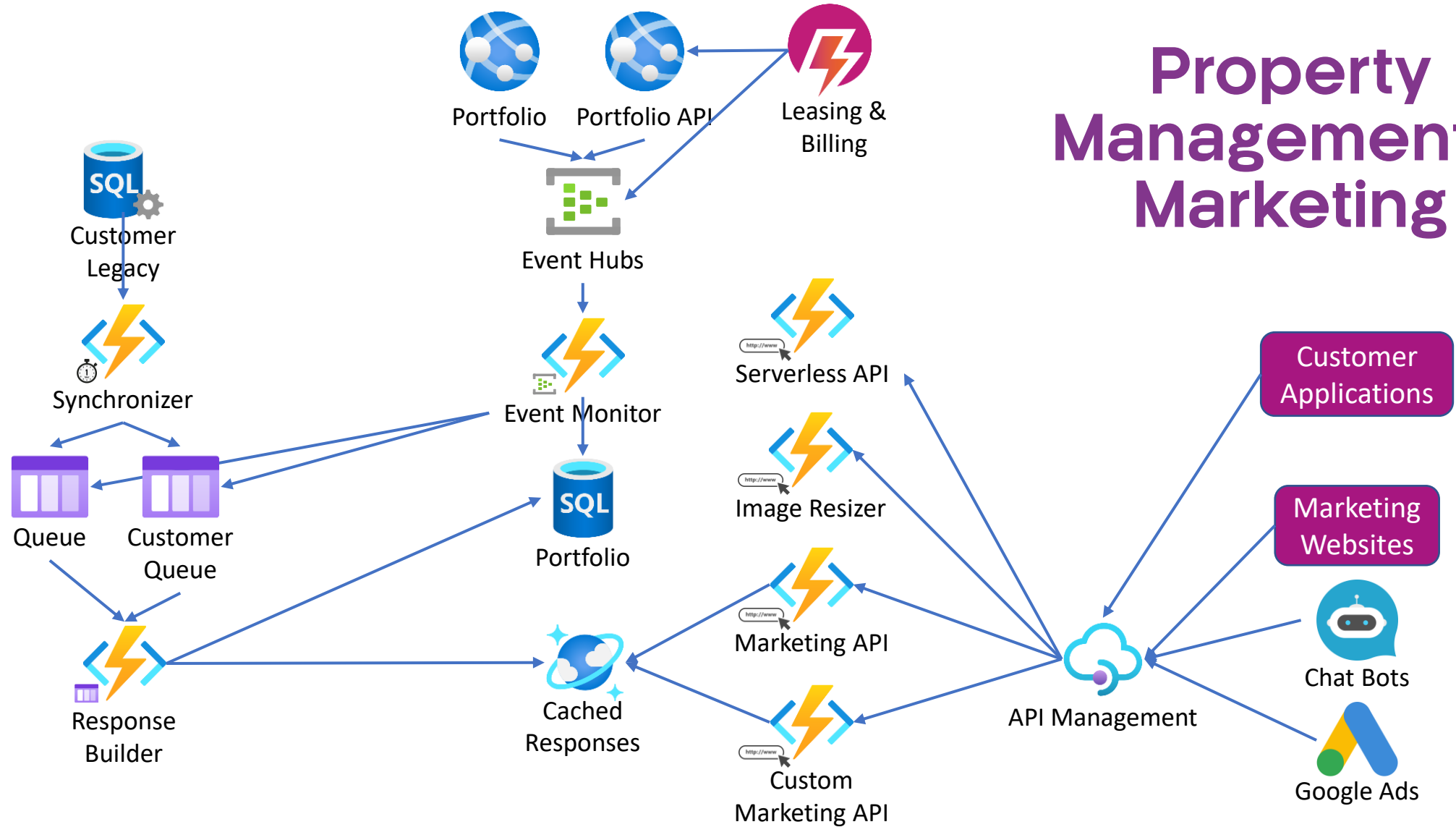
Replicating Data



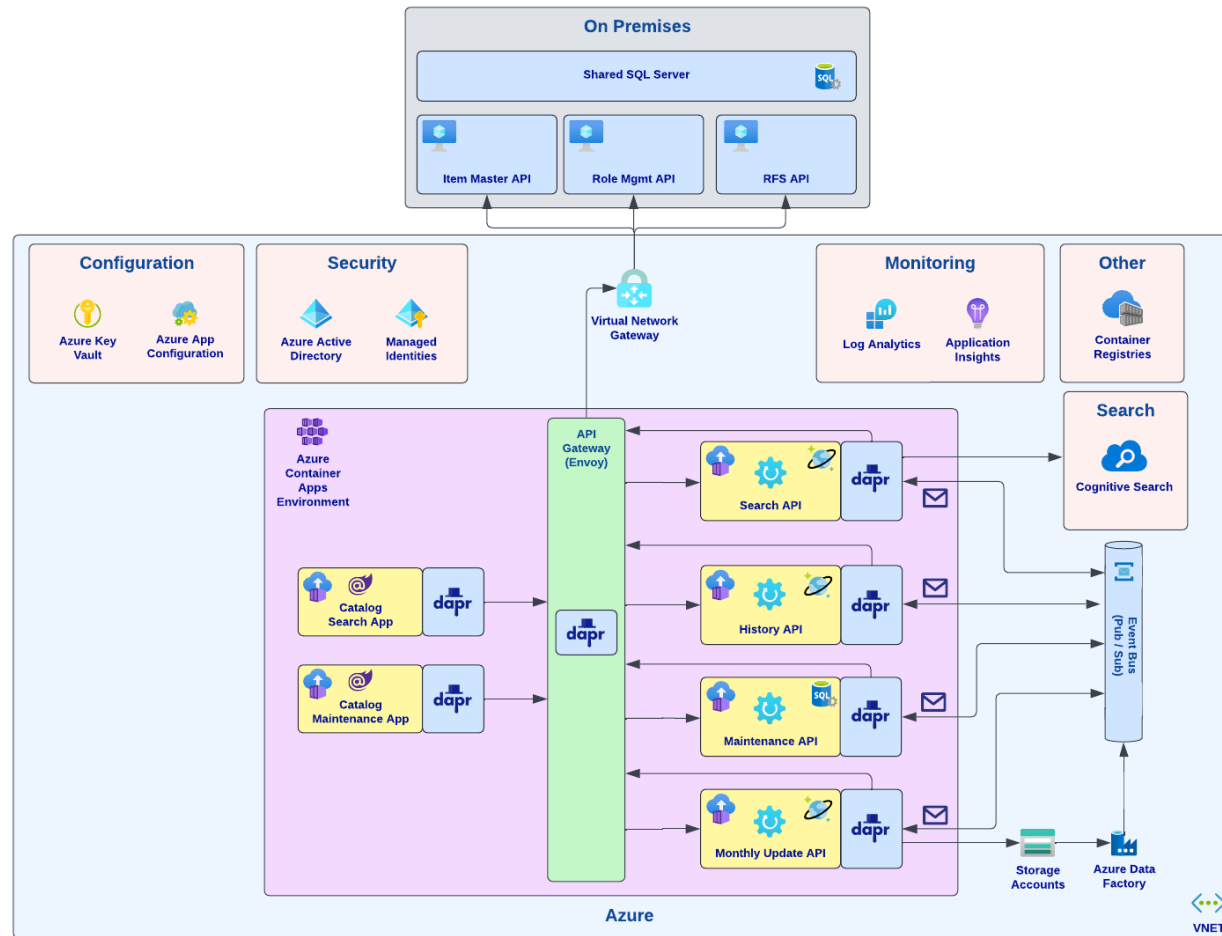
Real-Time Reporting



Property Management & Marketing



Catalog Maintenance



Interactive Lab

Azure Serverless Solutions Demystified: Learn, Build, and Scale with Ease!

Flight Tracking

- Receive telemetry data from aircraft
- Process it in real-time
- Provide accurate flight status



Key Requirements

**Telemetry Data
Processing**

**Flight Status
Updates**

**Scalability and
Reliability**

Challenges to Address

**Data Volume and
Velocity**

**Real-Time
Responsiveness**

**Data Integrity
and Security**

Interactive Lab

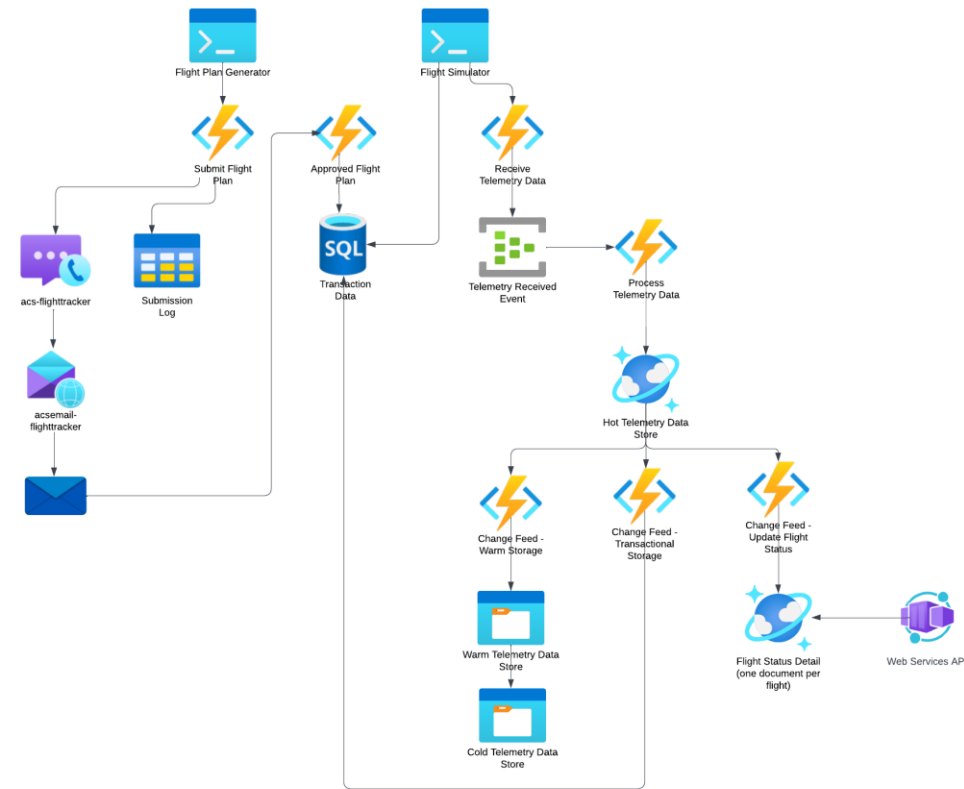
- Brainstorm on possible solutions for the flight tracking system
- You are not limited on cloud platforms



Possible Flight Tracking System

Azure Serverless Solutions Demystified: Learning, Build, and Scale with Ease!

My Flight Tracking System



Thank You



chadgreen@chadgreen.com



TaleLearnCode



ChadGreen.com



ChadGreen



ChadwickEGreen