EVENT-DRIVEN ARCHITECTURE SPECIFICATION

Summit Digital Solutions, Inc.

Document Version: 2.4

Last Updated: January 9, 2024

Classification: CONFIDENTIAL

1. INTRODUCTION

1. This Event-Driven Architecture Specification ("Specification") sets forth the technical and operational requirements for the event-driven architecture implementation within Summit Digital Solutions, Inc.'s ("Company") Peak Performance Platform(TM) and related systems.

2. This Specification is a controlled document subject to the Company's Information Security Policy (REF: SEC-2023-441) and Intellectual Property Protection Guidelines (REF: IP-2023-118).

2. DEFINITIONS

1. "Event" means any discrete change in state within the system that requires processing or notification.

2. "Event Producer" means any system component that generates events for consumption.

3. "Event Consumer" means any system component that receives and processes events.

4. "Event Bus" means the message broker infrastructure facilitating event transmission.

5. "Event Schema" means the formal definition of event structure and payload format.

3. ARCHITECTURAL REQUIREMENTS

1. Core Components

1.1. The architecture shall implement a distributed event bus using Apache Kafka v3.5 or later.

1.2. Event producers and consumers shall maintain loose coupling through standardized interfaces.

1.3. All components must support horizontal scaling and maintain high availability (99.99% uptime).

2. Event Processing

2.1. Events shall be processed according to the following principles:

a) At-least-once delivery guarantee

b) Ordered delivery within partitions

c) Idempotent processing capabilities

d) Dead letter queue implementation

2.2. Maximum event latency shall not exceed:

a) 50ms for critical events

b) 200ms for standard events

c) 1000ms for batch processing events

4. EVENT SCHEMAS AND CONTRACTS

1. Schema Requirements

1.1. All events shall conform to the Apache Avro schema format.

1.2. Schemas must include:

a) Unique event identifier

b) Timestamp (ISO 8601 format)

c) Source system identifier

d) Event type classification

e) Schema version

f) Payload data

2. Schema Governance

2.1. Schema changes shall follow semantic versioning (MAJOR.MINOR.PATCH).

2.2. Backward compatibility must be maintained for MINOR version changes.

5. SECURITY REQUIREMENTS

1. Authentication and Authorization

1.1. All event producers and consumers must authenticate using OAuth 2.0.

1.2. Event access control shall be implemented using role-based authorization.

2. Data Protection

2.1. Events containing sensitive data must be encrypted using AES-256.

2.2. Transport layer security (TLS 1.3) is required for all network communications.

6. MONITORING AND OBSERVABILITY

1. Required Metrics

1.1. The following metrics shall be collected:

a) Event throughput rate

b) Processing latency

c) Error rates

d) Consumer lag

e) Resource utilization

2. Alerting

2.1. Automated alerts shall be generated for:

a) SLA violations

b) Error rate thresholds

c) Consumer lag exceeding defined limits

d) Resource utilization above 80%

7. DISASTER RECOVERY

1. Recovery Requirements

1.1. Recovery Point Objective (RPO): 5 minutes

1.2. Recovery Time Objective (RTO): 30 minutes

2. Backup and Redundancy

2.1. Event logs shall be replicated across three geographic regions.

2.2. Hot standby systems must be maintained for critical components.

8. COMPLIANCE AND AUDIT

1. All event processing must maintain audit trails sufficient for SOC 2 Type II compliance.

2. Event retention periods shall align with data retention policies specified in DOC-2023-892.

9. PROPRIETARY RIGHTS

1. This Specification and all implementations thereof are proprietary to Summit Digital Solutions, Inc. and constitute protected trade secrets under applicable law.

10. APPROVAL AND MAINTENANCE

1. This Specification requires approval from the Chief Technology Officer and Chief Information Security Officer prior to implementation.

2. Review and updates shall occur at minimum annually or upon significant architectural changes.

APPROVED BY:

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Summit Digital Solutions, Inc.
Date: January 9, 2024

James Henderson
Chief Digital Officer
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Date: January 9, 2024