

API Integration Architecture Specification

Summit Digital Solutions, Inc.

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Classification: Confidential

1. Overview and Scope

1. This API Integration Architecture Specification ("Specification") defines the technical and security requirements for all application programming interfaces ("APIs") developed, maintained, or integrated by Summit Digital Solutions, Inc. ("Company") as part of its Peak Performance Platform(TM) and related service offerings.

2. This Specification applies to all internal and external APIs, including but not limited to:

- a) Core Platform APIs
- b) IoT Device Integration APIs
- c) Analytics Engine APIs
- d) Client Integration APIs
- e) Third-Party Service APIs

2. API Design Standards

1. All APIs must conform to RESTful architecture principles and implement the following:

- a) HTTP/HTTPS protocol compliance
- b) JSON data format for request/response payloads
- c) Standard HTTP methods (GET, POST, PUT, DELETE)
- d) Semantic versioning (v1, v2, etc.)
- e) Resource-oriented URLs

2. Authentication Requirements:

- a) OAuth 2.0 implementation for external APIs
- b) JWT (JSON Web Tokens) for session management
- c) API key authentication for internal services
- d) Multi-factor authentication for administrative endpoints

3. Security Requirements

1. Encryption Standards:

- a) TLS 1.3 or higher for all API communications
- b) AES-256 encryption for data at rest
- c) Perfect Forward Secrecy (PFS) implementation
- d) Regular rotation of encryption keys

2. Access Control:

- a) Role-based access control (RBAC)
- b) IP whitelisting capabilities
- c) Rate limiting and throttling
- d) Automated threat detection

4. Performance Requirements

1. Response Time Targets:

- a) 95th percentile response time < 200ms
- b) 99th percentile response time < 500ms
- c) Maximum timeout threshold of 30 seconds

2. Availability Requirements:

- a) 99.99% uptime for production environments
- b) Maximum planned downtime of 4 hours per quarter
- c) Automatic failover capabilities

5. Documentation Requirements

1. API Documentation Must Include:

- a) OpenAPI (Swagger) specification
- b) Authentication procedures
- c) Example requests and responses
- d) Error codes and handling
- e) Rate limiting details

2. Version Control:

- a) GitHub Enterprise repository maintenance
- b) Changelog documentation
- c) Deprecation notices (minimum 6 months)

6. Integration Requirements

1. Standard Integrations:

- a) IoT sensor data ingestion
- b) Machine learning model deployment
- c) Analytics engine connectivity
- d) Client system interfaces

2. Data Format Standards:

- a) UTF-8 encoding
- b) ISO 8601 datetime format
- c) Standardized error response structure
- d) Consistent naming conventions

7. Monitoring and Logging

1. Required Monitoring:

- a) Real-time performance metrics
- b) Error rate tracking
- c) Usage analytics
- d) Security event logging

2. Logging Requirements:

- a) Structured log format (JSON)
- b) Correlation IDs for request tracking
- c) PII data masking
- d) 12-month retention period

8. Compliance and Governance

1. Regulatory Compliance:
 - a) SOC 2 Type II requirements
 - b) GDPR compliance
 - c) CCPA compliance
 - d) Industry-specific regulations

2. Audit Requirements:
 - a) Quarterly security assessments
 - b) Annual penetration testing
 - c) Regular code reviews
 - d) Compliance documentation

9. Intellectual Property

1. All APIs, documentation, and related materials developed under this Specification are the exclusive property of Summit Digital Solutions, Inc.
2. Third-party components must be properly licensed and documented.

10. Modification and Updates

1. This Specification may be updated by the Company's Technology Governance Board with appropriate notice to affected parties.
2. Version history must be maintained in the Company's documentation management system.

Approval and Authorization

This API Integration Architecture Specification is approved and authorized by:

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Michael Chang

Chief Technology Officer

Summit Digital Solutions, Inc.

Date: January 9, 2024

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Summit Digital Solutions, Inc.

Date: January 9, 2024

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