Technical Specification: Enterprise API Gateway

# Document Information

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# Overview

This document specifies the technical requirements and implementation details for the Enterprise API Gateway system. The gateway will serve as the central entry point for all API requests, providing authentication, authorization, rate limiting, and monitoring capabilities.

# Functional Requirements

## Authentication and Authorization

The API Gateway must support multiple authentication methods:

* • OAuth 2.0 with JWT tokens
* • API key authentication
* • Basic authentication for internal services
* • SAML integration for enterprise SSO

## Rate Limiting and Throttling

* • Per-user rate limiting: 1000 requests per hour
* • Per-API rate limiting: 10000 requests per minute
* • Burst capacity: 200 requests per second
* • Configurable rate limits per client tier

## Monitoring and Logging

* • Real-time metrics collection
* • Request/response logging
* • Error tracking and alerting
* • Performance monitoring dashboards

# Non-Functional Requirements

## Performance

* • Response time: < 50ms for 95th percentile
* • Throughput: 10,000 requests per second
* • Availability: 99.9% uptime

## Security

* • TLS 1.3 encryption for all communications
* • Input validation and sanitization
* • DDoS protection
* • Security audit logging

# System Architecture

The API Gateway will be implemented using a microservices architecture with the following components:

* • Load Balancer: NGINX with SSL termination
* • API Gateway Core: Kong or AWS API Gateway
* • Authentication Service: Custom OAuth 2.0 provider
* • Monitoring Service: Prometheus + Grafana
* • Logging Service: ELK Stack (Elasticsearch, Logstash, Kibana)

# Implementation Plan

Phase 1: Core Gateway Setup (Weeks 1-4)

Phase 2: Authentication Integration (Weeks 5-8)

Phase 3: Monitoring and Logging (Weeks 9-12)

Phase 4: Testing and Deployment (Weeks 13-16)