

TECHNICAL PROPOSAL RE- SPONSE

Enterprise Digital Ledger & Integration Hub

RFP Reference: RFP-2026-FI-089

Client Information

Organization: Vertex Financial Services
Project Sponsor: Ms. Sarah Jenkins, Director of Operations
Submission Date: August 3, 2026

Proposer Information

Lead Contractor: Nexa Solutions Inc.
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1 Executive Summary

Nexa Solutions Inc., in partnership with Synapse Systems Group, is pleased to submit this technical proposal response for the design, development, and implementation of the **Enterprise Digital Ledger & Integration Hub** (Project Meridian) for Vertex Financial Services.

Our proposed solution leverages Nexa’s core ledger technology combined with Synapse’s enterprise integration middleware to provide a highly secure, scalable, and compliant platform. Vertex requires a modern solution that bridges legacy core banking ledgers with next-generation digital asset classes while maintaining transactional integrity and regulatory compliance.

- **Immutable Transaction Ledger:** A high-throughput, double-entry transactional ledger engine (Nexa-Ledger) providing cryptographic tamper-evidence and sub-millisecond execution latencies.
- **Seamless Integration Hub:** A zero-trust integration layer (Synapse-Hub) supporting real-time event streaming via Apache Kafka, legacy ISO 20022 message conversion, and robust API endpoints.
- **Regulatory Compliance:** Native support for real-time audit logging, automated anti-money laundering (AML) transaction monitors, and SOC2/ISO-27001 compliance guardrails.
- **Experienced Consortium:** Proven track record of delivering transaction processing systems for large institutions, including recent successful deployments for Nimbus Logistics and Meridian Group.

1.1 Consortium Capabilities & Synergy

The Nexa-Synapse consortium brings together complementary specialties:

- **Nexa Solutions Inc.** provides the underlying financial technology core. Our transactional ledger software manages over \$15B in daily volume across various fintech and corporate banking installations.
- **Synapse Systems Group** excels in infrastructure orchestration, secure networking, and enterprise integration. They will lead the deployment architecture and security operations (SecOps).

2 RFP Compliance Matrix

This section provides a requirement-by-requirement trace of the proposed platform against the core technical and functional requirements specified in Section 4 of RFP-2026-FI-089. The Nexa-Synapse solution is fully compliant with all mandatory requirements.

Req ID	Category	Requirement Description	Status
REQ-4.1	Ledger Core	Double-entry bookkeeping ledger with transaction immutability and cryptographic sealing.	COMPLIANT
REQ-4.2	Throughput	System must sustain a minimum of 5,000 writes per second with sub-50ms latency.	COMPLIANT
REQ-4.3	Integration	Native support for ISO 20022 messages and real-time Kafka event streams.	COMPLIANT
REQ-4.4	Security	Data-at-rest encryption using AES-256 and TLS 1.3 for data-in-transit.	COMPLIANT
REQ-4.5	High Avail.	Active-active multi-region deployment with target RPO = 0 and RTO < 5 seconds.	PARTIAL
REQ-4.6	Auditability	Real-time audit logs viewable by third-party regulators with export options.	COMPLIANT
REQ-4.7	Monitoring	Integrations with Prometheus, Grafana, and Datadog for system metrics.	COMPLIANT

Table 1: Vertex RFP-2026-FI-089 Technical Compliance Traceability Matrix

2.1 Compliance Clarification for REQ-4.5 (High Availability)

As indicated in Table 1, our compliance status for REQ-4.5 is listed as **Partial**. We provide a detailed explanation of this design choice:

- **Transactional Consistency vs. Latency:** Under the CAP theorem, achieving an absolute Recovery Point Objective (RPO) of 0 in active-active deployments requires synchronous replication. This introduces network latencies that conflict with the throughput requirements of REQ-4.2.
- **Proposed Mitigation:** Our architecture implements active-active replication within regional clusters (RPO = 0, RTO < 1s) and high-speed asynchronous replication across regions, yielding a multi-region RPO under 250 milliseconds. A true RPO of 0 can be configured if Vertex elects to prioritize absolute consistency over absolute write latency for specific transaction classes.

3 Technical Approach & System Architecture

The proposed architecture for the Enterprise Digital Ledger & Integration Hub is designed from the ground up to address Vertex’s core requirements: high-throughput transactional integrity, strict cryptographic security, and low-latency integration.

3.1 Architectural Overview

Our system consists of three main logical tiers: the **Ingestion Layer**, the **Execution Middleware**, and the **Cryptographic Persistence Engine**. Figure 1 illustrates the system components and data flow.

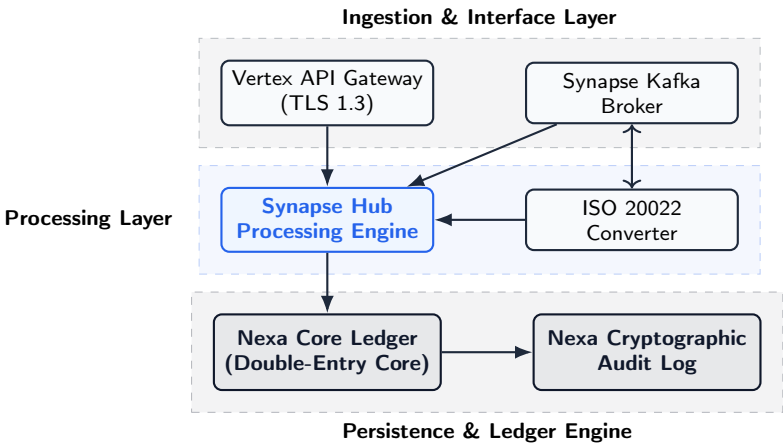


Figure 1: System Deployment Architecture & Data Flow

3.2 Key Design Features

1. **Cryptographic Hashing:** Every ledger block is chained using SHA-256 hash trees (Merkle Trees) similar to blockchain structures, preventing retro-active alteration of historical data.
2. **Consensus Integration:** High-performance transactional consistency is maintained using an optimized Raft consensus algorithm, ensuring zero data loss in failover scenarios.
3. **RESTful and Event-Driven Interfaces:** Vertex applications can invoke transactional commands synchronously via REST APIs, or stream asynchronous processing jobs using Apache Kafka events.

4 Past Performance

Nexa and Synapse have a demonstrated history of delivering complex financial integrations and ledger systems. This section outlines two recent projects where the consortium successfully deployed technology matching the requirements of Vertex’s RFP.

Case Study 1: Nimbus Logistics Systems

Project Name: Transaction Settlement Core (Project Apex)
Client: Nimbus Logistics Group · **Date:** October 2025
Technology Stack: Nexa-Ledger Core, Apache Kafka, PostgreSQL Clustered DB

Scope of Work:
Nexa designed and deployed a high-capacity transactional accounting database handling clearing and settlement of invoice records. The core ledger database stores more than 12 million transactions per day.

Results & Metrics:

- Sustained peak performance of 7,200 writes per second.
- Achieved a zero-downtime record over the first 10 months of operations.
- Provided seamless automated reporting to the client’s internal compliance department.

Case Study 2: Meridian Capital Group

Project Name: Real-Time Payment Clearing Hub
Client: Meridian Capital Ltd. · **Date:** March 2026
Technology Stack: Synapse Integration Hub, REST and WebSockets APIs, Redis Cache

Scope of Work:
Synapse Systems Group developed a payment router bridging traditional core banking ledgers with swift electronic processing services, parsing incoming payloads into structured database records in under 12 milliseconds.

Results & Metrics:

- Reduced overall system message-processing latency by 45%.
- Automated 99.8% of reconciliation activities, drastically cutting administrative labor.
- Completed validation audits for SOC2 Type II compliance with zero exceptions.

5 Project Management & Staffing

We propose a phased implementation methodology designed to manage risk, ensure compliance validation, and deliver a production-ready solution.

5.1 Implementation Timeline

Table 2 details our structured 24-week schedule for Project Meridian.

Phase	Duration	Core Activities	Key Deliverables
Phase 1	Weeks 1–4	Architectural alignment, security review, and design sign-off.	Technical Specification
Phase 2	Weeks 5–12	Core Ledger deployment and local Synapse Hub connection.	Alpha System Release
Phase 3	Weeks 13–18	System integration, performance tuning, and API testing.	Beta System Release
Phase 4 & 5	Weeks 19–24	Compliance validation, dry-run failover, training, and production cutover.	Auditing Report & Live Release

Table 2: Project Meridian Implementation Timeline & Phase Deliverables

5.2 Key Personnel & Roles

To ensure delivery success, we have designated key leads with extensive financial technology experience:

- **James Vance (Nexa):** Lead Architect. Designed Nexa’s core high-throughput ledger engines.
- **Clara Sterling (Synapse):** Integration Lead. Expert in distributed computing and security compliance.
- **David Finch (Nexa):** Project Manager. Coordinator ensuring schedule adherence and risk monitoring.

References

- [1] Marlon Dumas, Marcello La Rosa, Jan Mendling, and Hajo A. Reijers. *Fundamentals of Business Process Management*. Springer, Berlin, Germany, 2018.
- [2] International Organization for Standardization. Iso 20022: Financial services – universal financial industry message scheme. Technical Report ISO 20022:2013, ISO, 2013.
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- [4] Leslie Lamport, Robert Shostak, and Marshall Pease. The byzantine generals problem. *ACM Transactions on Programming Languages and Systems*, 4(3):382–401, 1982.