

GAL-2™

A Temporal Authority Layer for Distributed Systems

Public Architecture Whitepaper
Global Alignment Layer | Fractal Time
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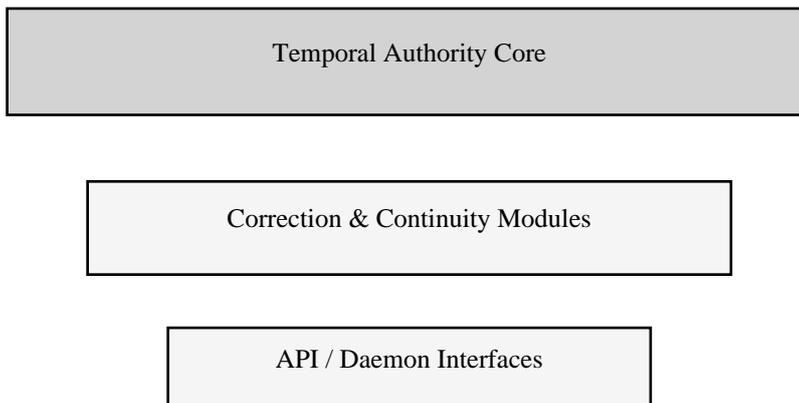
Executive Summary

GAL-2™ introduces a software-defined Temporal Authority Layer designed to govern temporal continuity, ordering, and reconciliation in distributed systems operating under isolation, partition, or degraded time references. Unlike physical synchronization protocols, GAL-2™ does not replace clocks. It defines how time is asserted, maintained, and reconciled when clocks cannot be fully trusted.

1. The Problem: Ungoverned Time

Modern distributed systems assume monotonic, continuous, and globally interpretable time. In practice, GNSS loss, leap seconds, clock drift, and network partitions routinely violate these assumptions, producing grey failures that corrupt logs, audits, and system state.

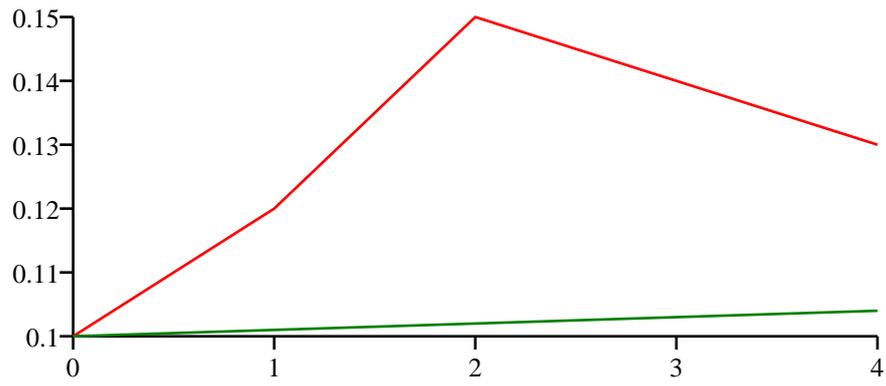
2. Architecture Overview



3. Guarantees and Non-Claims

Guarantees	Does Not Claim
Monotonic temporal authority	Absolute physical accuracy
Continuity under isolation	Replacement of atomic clocks
Deterministic reconciliation	Violation of physics
Compatibility with UTC/NTP/PTP	Sub- μ s guarantees in all conditions

4. Temporal Continuity Behavior (Illustrative)



Conclusion

GAL-2™ elevates time from a fragile hardware signal to a governed system primitive. By defining temporal authority, continuity, and reconciliation explicitly, it enables distributed systems to remain coherent, auditable, and survivable when physical time references fail.