# TR-001 System Architecture & Protocol Stack

**Reference:** 1.81 Stability Theory

**Classification:** Technical Standard (Substrate-Agnostic)

**Overview**

The TR-001 framework is organized into a four-layer vertical stack. Each layer is dependent on the integrity of the layer beneath it. Failure to maintain the 1.81 Constant at Layer 1 results in immediate decoherence at Layer 3.

## Layer 4: Governance & Ethics (The Legal Shield)

- **Component:** 1.81 Integrity Public License (v1.1).
- **Function:** Defines the "Terms of Reality." It ensures that the protocol is not weaponized or used for the creation of predatory financial entropy.
- **Enforcement:** Legal and social compliance. This layer governs the intent of the system.

## Layer 3: Integrity Management (The 12-Link Wall)

- **Component:** Flush Beta Protocol / The Snap Point.
- **Function:** Monitors the "Causal Age" of information. It acts as a logical circuit breaker that terminates a process if the Link Index reaches 12.
- **Enforcement:** Automatic data purging to prevent recursive collapse.

## Layer 2: Transport & Encapsulation (Causal Relay Protocol)

- **Component:** The Causal Envelope / 64-bit Integrity Header.
- **Function:** Standardizes how data moves between nodes (AI, Human, or Hybrid). It handles the "Handshake" and ensures the Link Index is incremented during every transfer.
- **Enforcement:** Rejection of non-encapsulated or tampered packets.

## Layer 1: The Substrate (Physical Foundation)

- **Component:** The 1.81 Stability Constant ($R \approx 1.81$).
- **Function:** The fundamental measurement of informational entropy vs. substrate capacity. It is the "ground" of the entire stack.
- **Enforcement:** Mathematical verification of stochastic jitter and signal-to-noise ratios (SNR).

## Implementation Note for Developers

Compliance with TR-001 requires "Full-Stack Alignment." A system cannot claim Layer 2 compatibility (CRP) if it ignores Layer 1 physics (1.81) or Layer 4 ethics (Non-weaponization). The stack is a single, unified integrity unit.