Part 5: System Model & Execution Flow

The Deterministic Execution Ladder

Authoritative Edition
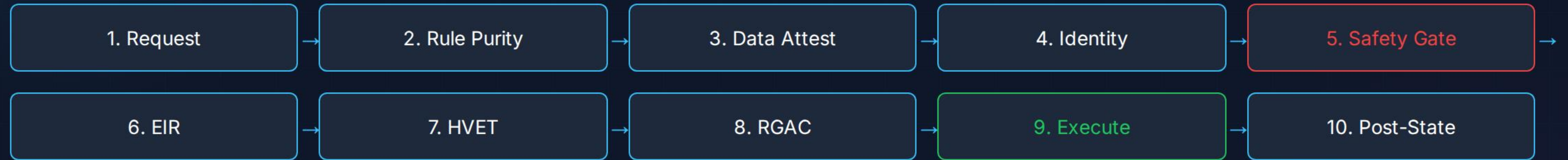
Overview: No Unverified Paths

The NOVAK Protocol defines a deterministic, identity-bound, cryptographically-enforced execution lifecycle.

👤 Applies to Humans.

🤖 Applies to AI & Robots.

🏛 Applies to Governments.

The Invariant

No Proof = No Action.

The 10-Step Execution Ladder

1. Request	→	2. Rule Purity	→	3. Data Attest	→	4. Identity	→	5. Safety Gate	→
6. EIR	→	7. HVET	→	8. RGAC	→	9. Execute	→	10. Post-State	

Every step enforces specific NOVAK Laws (L0-L15).

System Layer Model

1. User/System Request Layer

2. Rule Layer (R)

3. Data Layer (D)

4. Identity Layer (I)

5. Safety Gate Layer (Enforcement)

6. Proof Layer (EIR + HVET)

7. Audit Layer (RGAC)

8. Execution Layer

9. Post-State Verification

Step 1 & 2: Init & Purity

1. Request Initiation

PS-X Enforcement: Checks for intent, fraud signals, and cognitive bias before processing begins.

```
Req = { actor, device, rule-ID, payload }
```

2. Rule Purity (R)

Enforces L1 (Determinism). Rule must be a side-effect free pure function.

```
HR = SHA3-512(R)
```

Step 3 & 4: Data & Identity

3. Data Attestation (D)

Enforces L2/L3. Schema-locking and immutability checks.

```
HD = SHA-256(Data)
```

4. Identity Binding (I)

Enforces L6. Binds User + Device (TPM) + Jurisdiction + Intent.

```
HI = SHA-256(User + Device + Intent)
```

Step 5: Safety Gate (SG)

The deterministic barrier.

- ✓ R is pure.
- ✓ D is non-malleable.
- ✓ I is verified.

- ✓ PL-X signals match.
- ✓ PS-X fraud cleared.
- ✓ T is monotonic.

If SG fails, NOTHING proceeds.

Step 6 & 7: The Proofs

6. EIR (Receipt)

Binds Identity to Execution. Publicly verifiable.

(formerly NIPS)

7. HVET (Trace)

Cryptographic fingerprint of the entire event **before** it happens.

```
H(HR + HD + HI + HO + T)
```

Step 8: RGAC Commit

Recursive Global Audit Chain.

```
RGAC(n) = H( RGAC(n-1) // HVET // EIR // T )
```

If any entry is modified, all future verification fails globally.

| L7 Enforced | L15 Enforced | PL-X Integrity |

Step 9 & 10: Action & Verify

9. Execution

PERMITTED.

Only now does the system act. Deterministic, non-probabilistic.

10. Post-State Verification

System verifies Actual Output (O) == Expected Output (HO).

Ensures Machine Non-Deviation (L14).

Why This Is Authoritative

NOVAK's flow mathematically removes:

✕	✕	✕	✕
Ambiguity	**Nondeterminism**	**Tampering**	**Silent Drift**

It enforces: Determinism + Identity + Proof + Auditability.

Questions?

NOVAK Protocol Standards Series

Part 5: System Model