

Intelligent Data Transformation.  
Coherence-Scored. Evidence-Backed.









**AetheriaForge**

```
sys.init('ÆtheriaForge')
```

```
// The definitive transformation engine for  
Medallion Lakehouse architectures.
```



# The Invisible Risks in Standard Medallion Transformations

	Standard Pipeline	ÆtheriaForge Standard
Information Loss	 <b>Unmeasured</b> Data is reshaped or dropped silently. Quality is assumed if the job completes.	 <b>Scored</b> Every operation receives a mathematical Shannon Entropy coherence score (0.0 to 1.0).
Entity Resolution	 <b>Ad-hoc</b> Hardcoded mapping tables that do not scale and leave no audit trail.	 <b>Governed</b> Deterministic cross-source matching with explicit evidence of every merge.
Temporal Collisions	 <b>Invisible Overwrites</b> CDC streams, SCD Type 2, and batch loads clash in silent merge conflicts.	 <b>Reconciled</b> Explicit temporal conflict detection with strategy-driven resolution reporting.



# The Four Pillars of the Transformation Core

## The Forge Engine

Transformation Core.  
Uses Shannon entropy to  
measure exact information  
preservation ratios.



sys.mod.coherence

## The Temporal Engine

Intercepts and merges  
conflicting CDC and batch  
timestamps.



sys.mod.time

## The Resolution Engine.

Reconciles disparate  
source identifiers into  
unified entities.



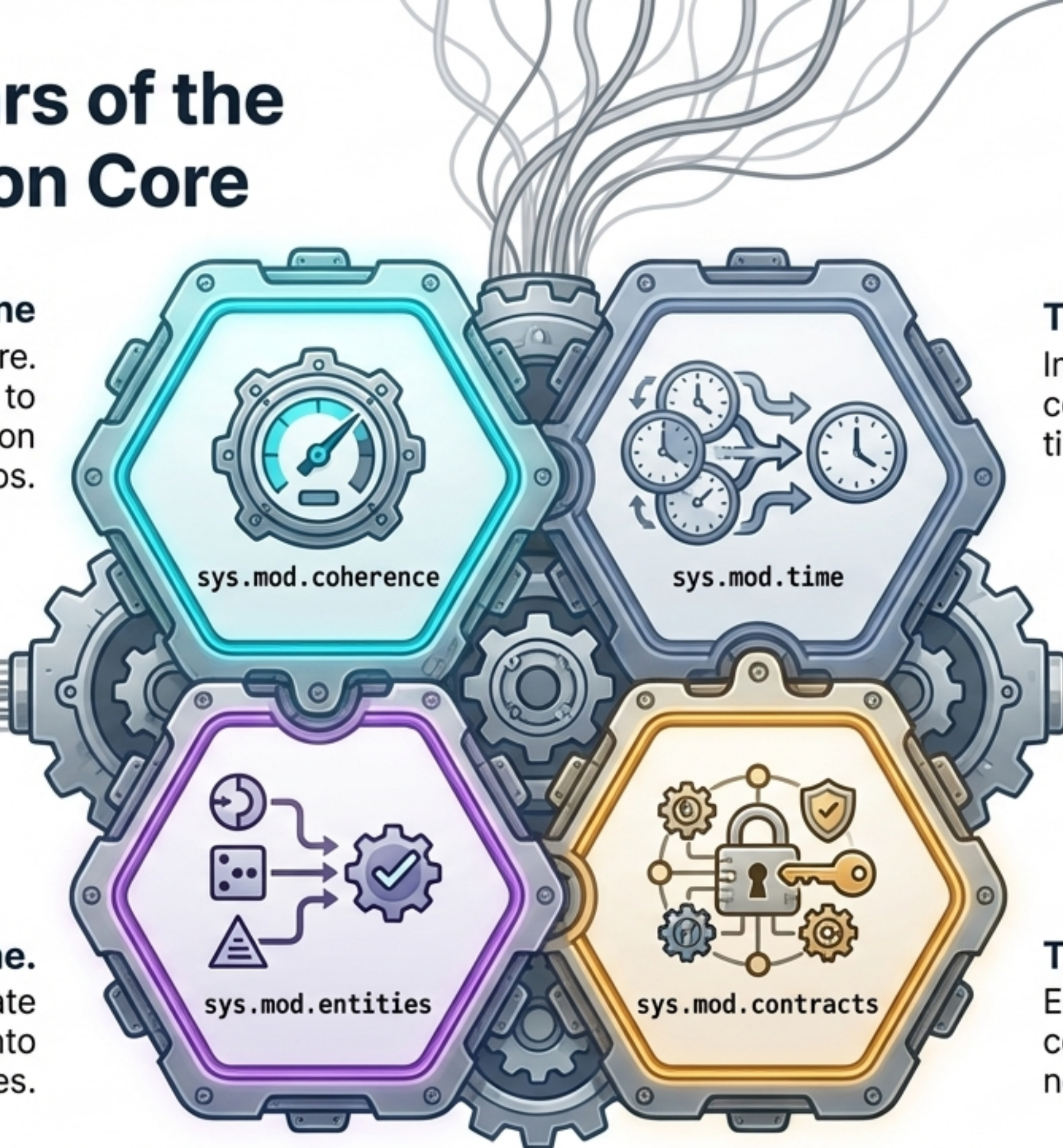
sys.mod.entities

## The Schema Engine.

Enforces versioned YAML  
contracts, quarantining  
non-conformant records.



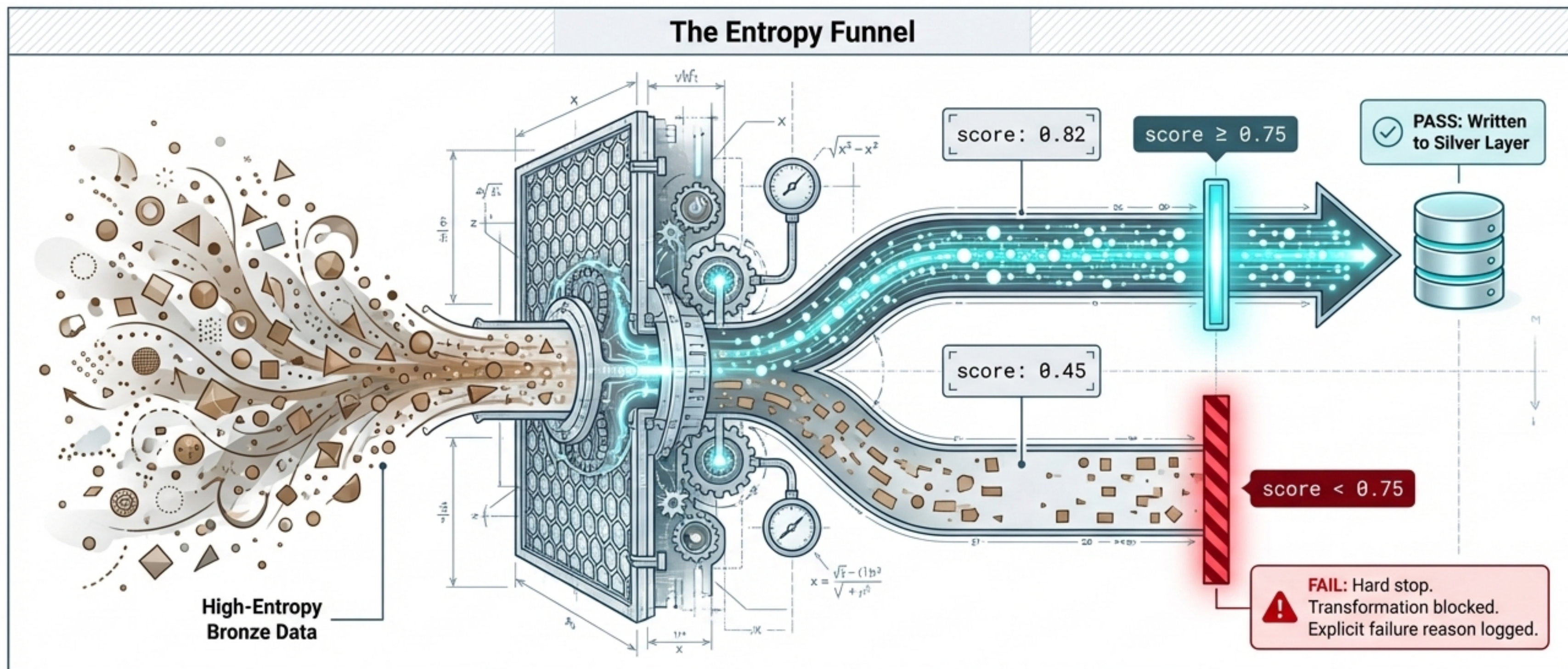
sys.mod.contracts





# Transformation Quality Must Be Measured, Not Assumed

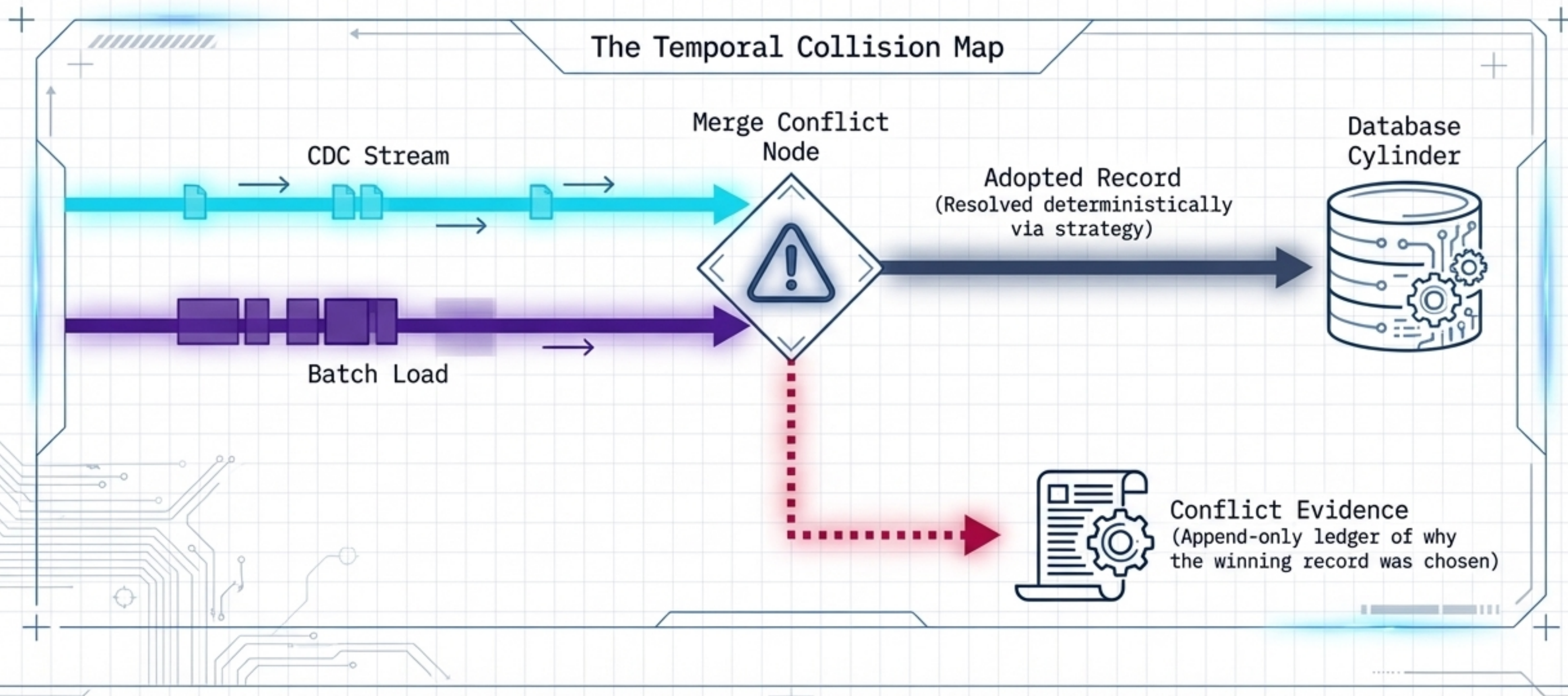
Every transformation alters data. ÆtheriaForge calculates the Shannon Entropy before and after the operation, producing a coherence score representing the ratio of preserved information.





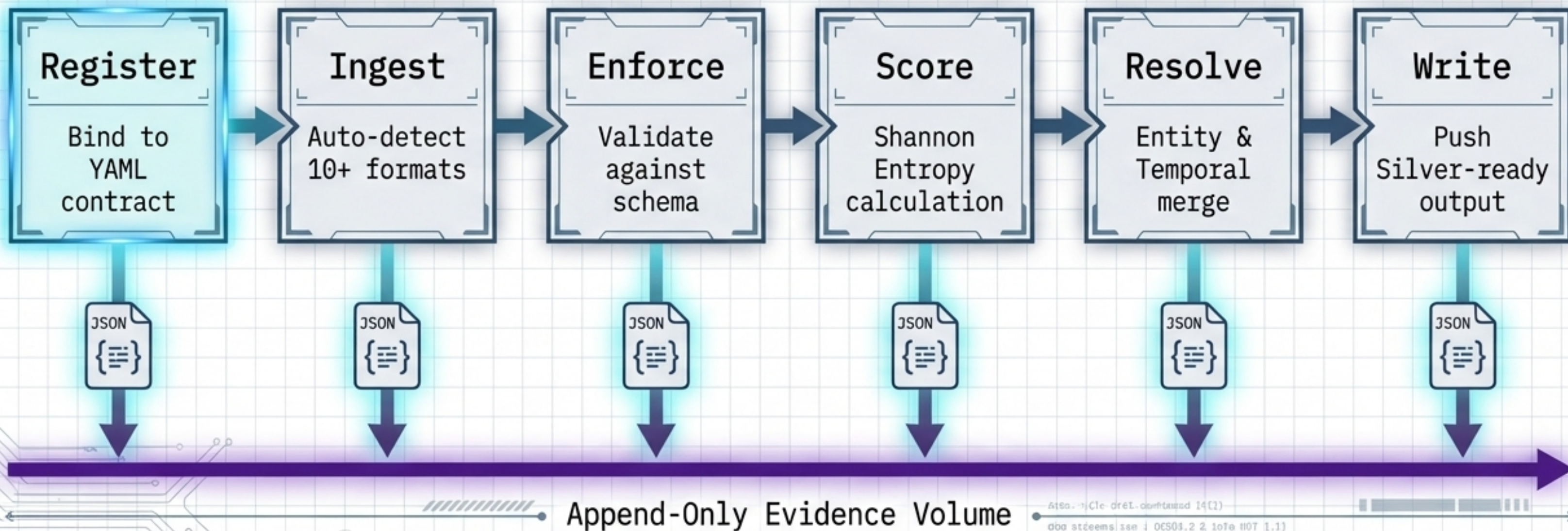
# Resolving Temporal Collisions with Zero Silent Overwrites

When CDC streams and Batch loads create overlapping records, the Temporal Engine intercepts the collision and explicitly logs the overwritten data.





# The Declarative Transformation Lifecycle

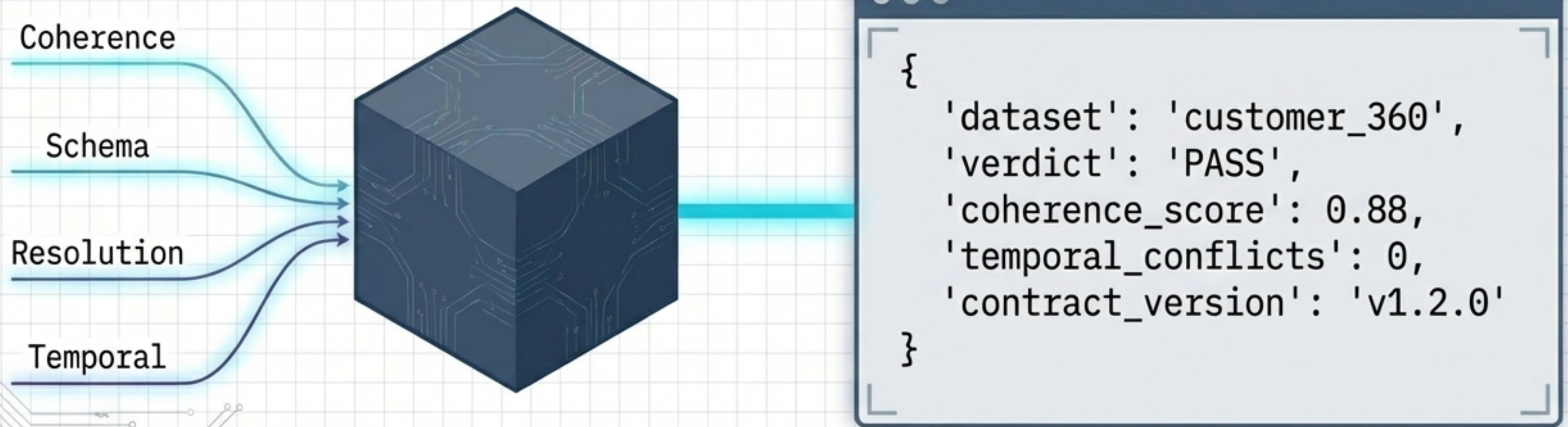


Every phase writes append-only artifacts. Nothing passes silently.



# The True Differentiator: The Immutable Audit Trail

ÆtheriaForge isn't just a pipeline; it is an evidence-generation machine. Every action converges into a single, queryable mathematical record.



**A mathematical, append-only record of what changed, why, and whether it met the threshold.**

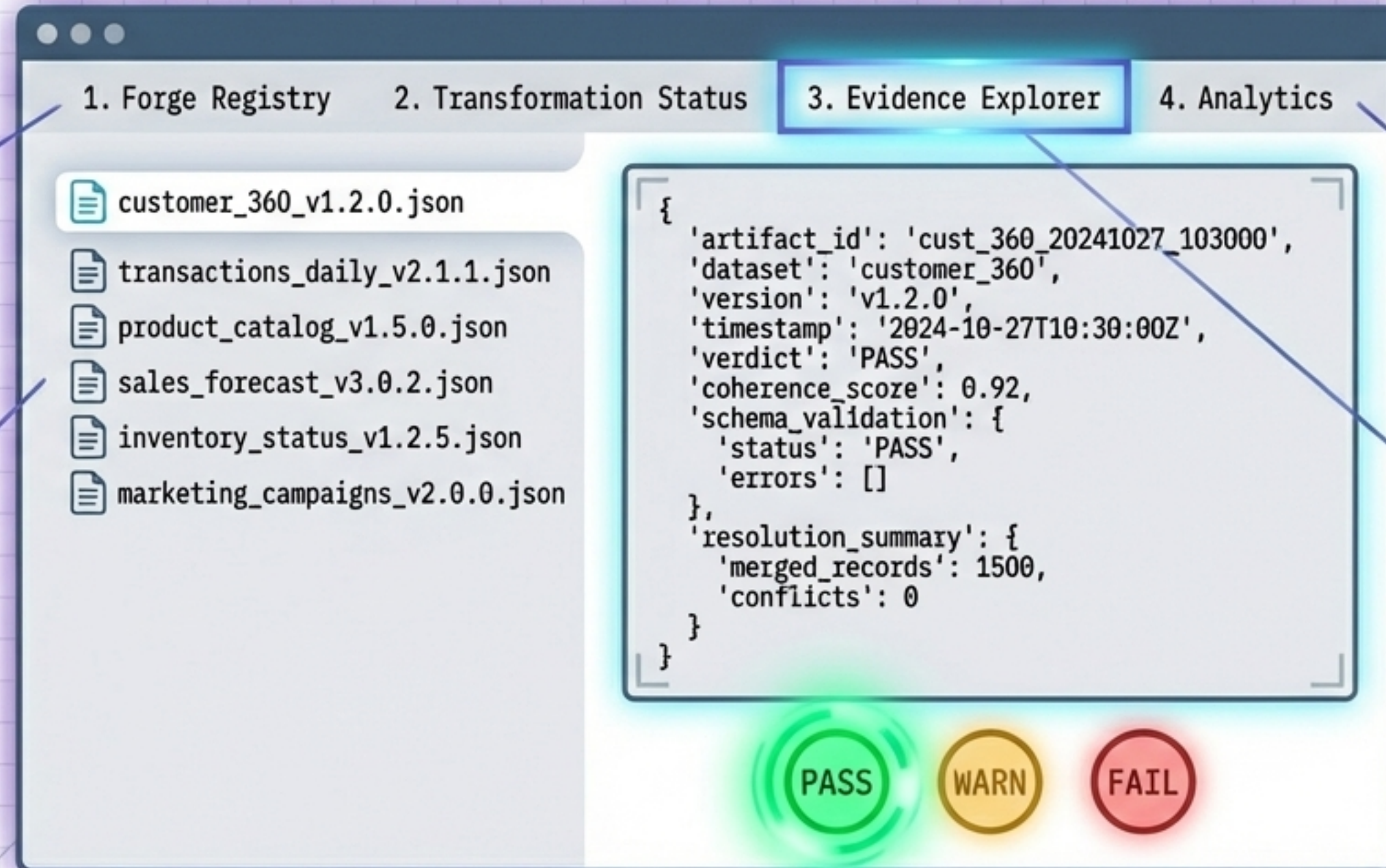


# Governed Visibility via the Operator Dashboard

A read-only App providing full access to the transformation history. Operators review data health without editing notebooks or writing queries.

Browse version-aware schema topologies.

Filter recent runs by PASS/WARN/FAIL verdicts.



1. Forge Registry   2. Transformation Status   **3. Evidence Explorer**   4. Analytics

customer\_360\_v1.2.0.json  
transactions\_daily\_v2.1.1.json  
product\_catalog\_v1.5.0.json  
sales\_forecast\_v3.0.2.json  
inventory\_status\_v1.2.5.json  
marketing\_campaigns\_v2.0.0.json

```
{
  'artifact_id': 'cust_360_20241027_103000',
  'dataset': 'customer_360',
  'version': 'v1.2.0',
  'timestamp': '2024-10-27T10:30:00Z',
  'verdict': 'PASS',
  'coherence_score': 0.92,
  'schema_validation': {
    'status': 'PASS',
    'errors': []
  },
  'resolution_summary': {
    'merged_records': 1500,
    'conflicts': 0
  }
}
```

PASS   WARN   FAIL

Inspect the full payload of any single artifact.

Visual breakdowns of coherence trends over time.



# Flexible Topologies: Standalone by Default, Powerful When Bundled

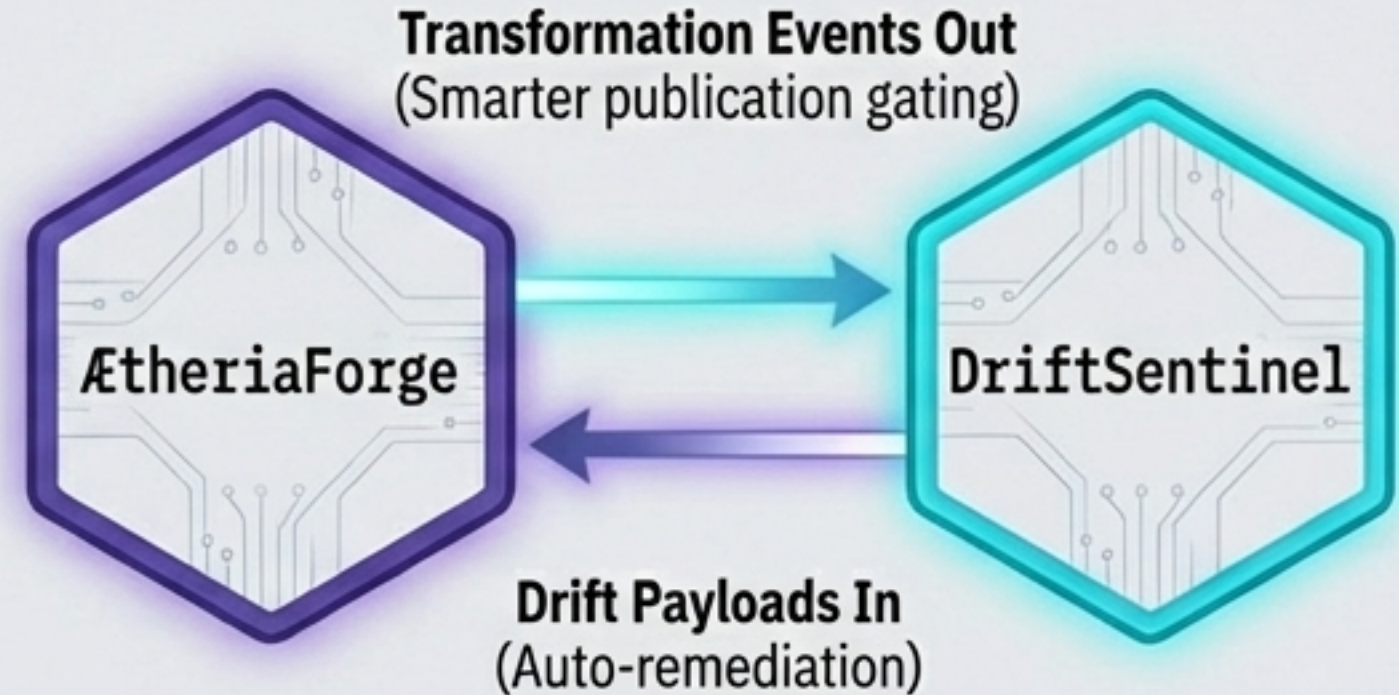
## Standalone Mode (Default)



NullEventChannel

Operates independently. Zero external dependencies. Maximum architectural purity.

## Bundled Mode (Opt-In)



Integrates seamlessly into the workspace to form a closed-loop governance cycle.



# The Complete Governed Medallion Pipeline

Moving data isn't the hard part. Proving the transformation preserved what it should, with evidence, is the standard we deliver.

## DriftSentinel

Primary Layer: Bronze (Detection) & Gold (Gating)

- Detect statistical drift
- Block bad publishes
- Enforce data shapes

## ÆtheriaForge

Primary Layer: Silver (Transformation)

- Reconcile entities across sources
- Merge temporal timeframes
- Forge clean data with scored coherence

The EthereaLogic Databricks Suite

