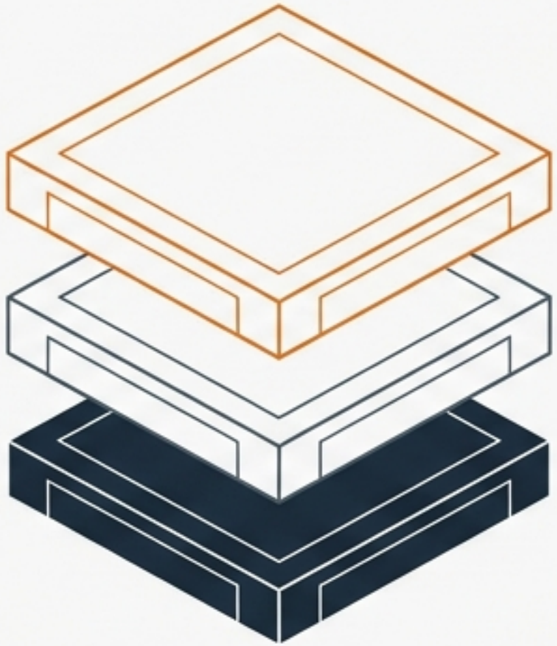
The Vertically Integrated Architecture for Enterprise AI Governance

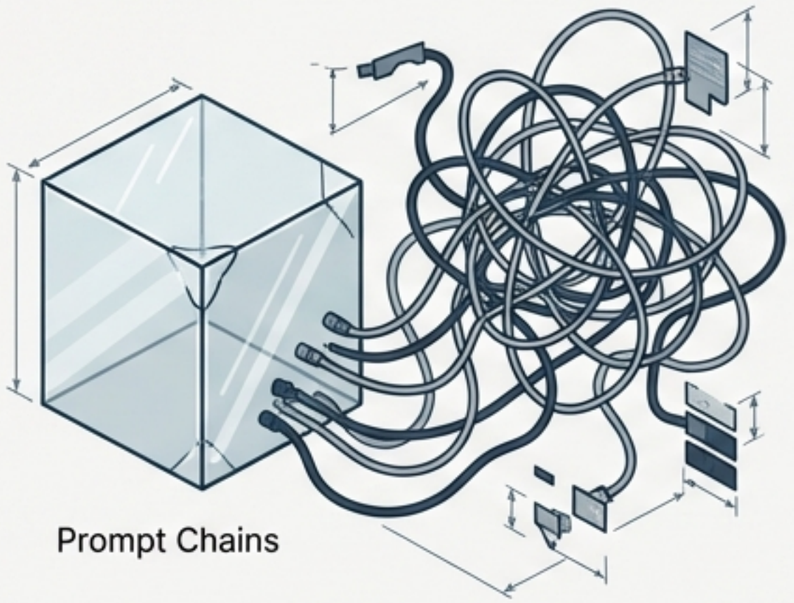


From Smart Models to Trusted Operations

OPENLINK SOFTWARE | ARCHITECTURAL OVERVIEW

The Operational Shift: From Chatbots to Agentic Systems

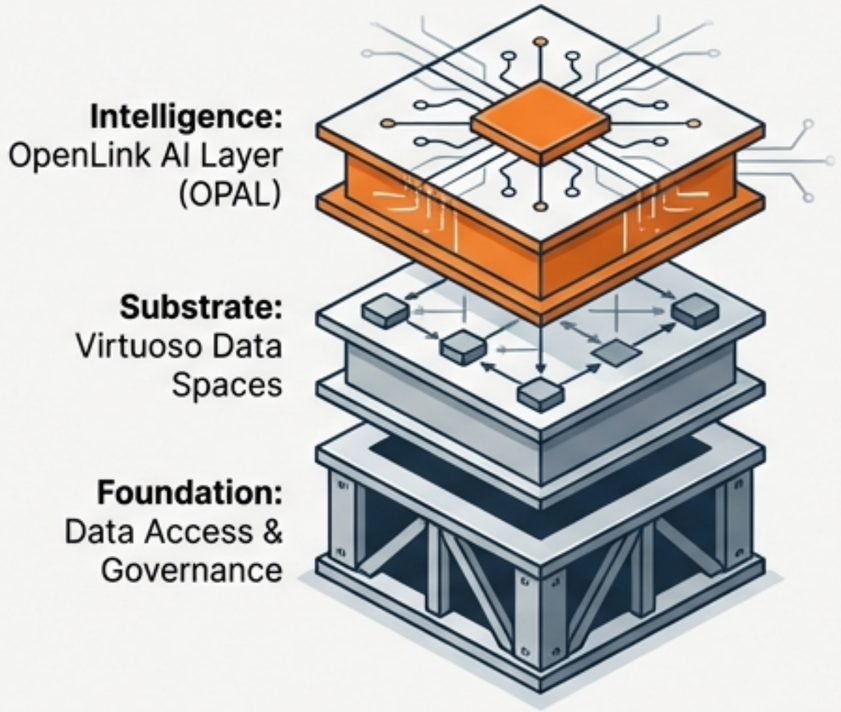
The Challenge: Brittle & Opaque



AI agents are transitioning from passive retrieval to active operations. However, current infrastructures are failing:

- **Context Failure:** Models lack reliable memory.
- **Operational Risk:** Reliance on fragile prompt chains and data copies.
- **Governance Gap:** Security policies are invisible to the model.

The Solution: Vertically Integrated



OpenLink provides a vertically integrated platform:

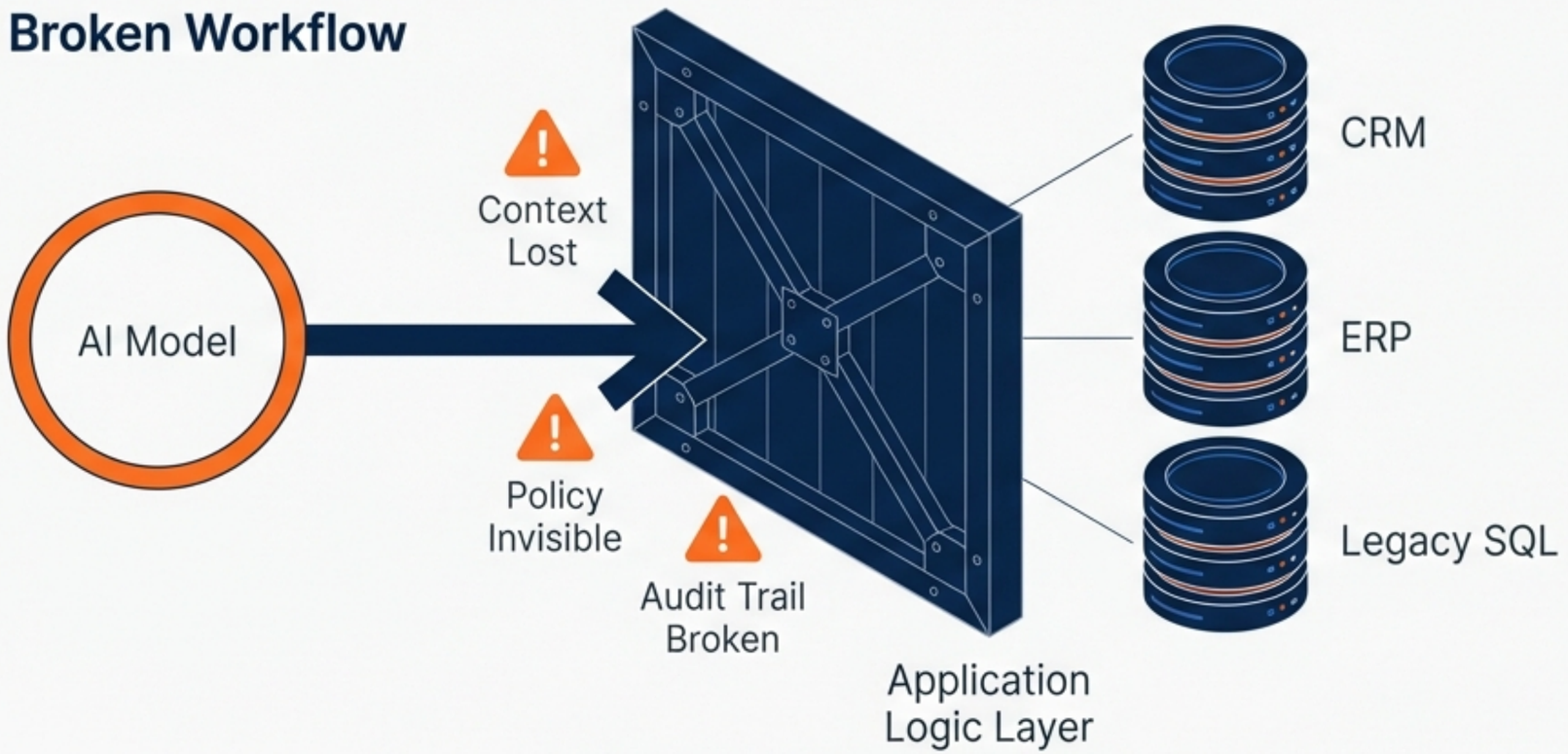
- **Foundation:** Governance enforced at the Data Access layer (ODBC/JDBC).
- **Substrate:** Semantic harmonisation via Virtuoso Data Spaces.
- **Intelligence:** Continuous AI Agents (OPAL) using open standards.

Swiss Engineering White Paper

The Challenge is Integration, Not Intelligence

The industry has solved for model intelligence, but enterprise adoption is stalled by integration risks. Agents need to reason across fragmented systems, but “black box” deployments sever the link between policy and action.

Broken Workflow



Key Friction Points:

1. **Context Failure**: Agents struggle to reason across fragmented systems without hallucinating.
2. **Operational Risk**: “Brittle prompt chains” create security blind spots.
3. **Governance Gap**: Policies applied at the application level are invisible to agents accessing data directly.

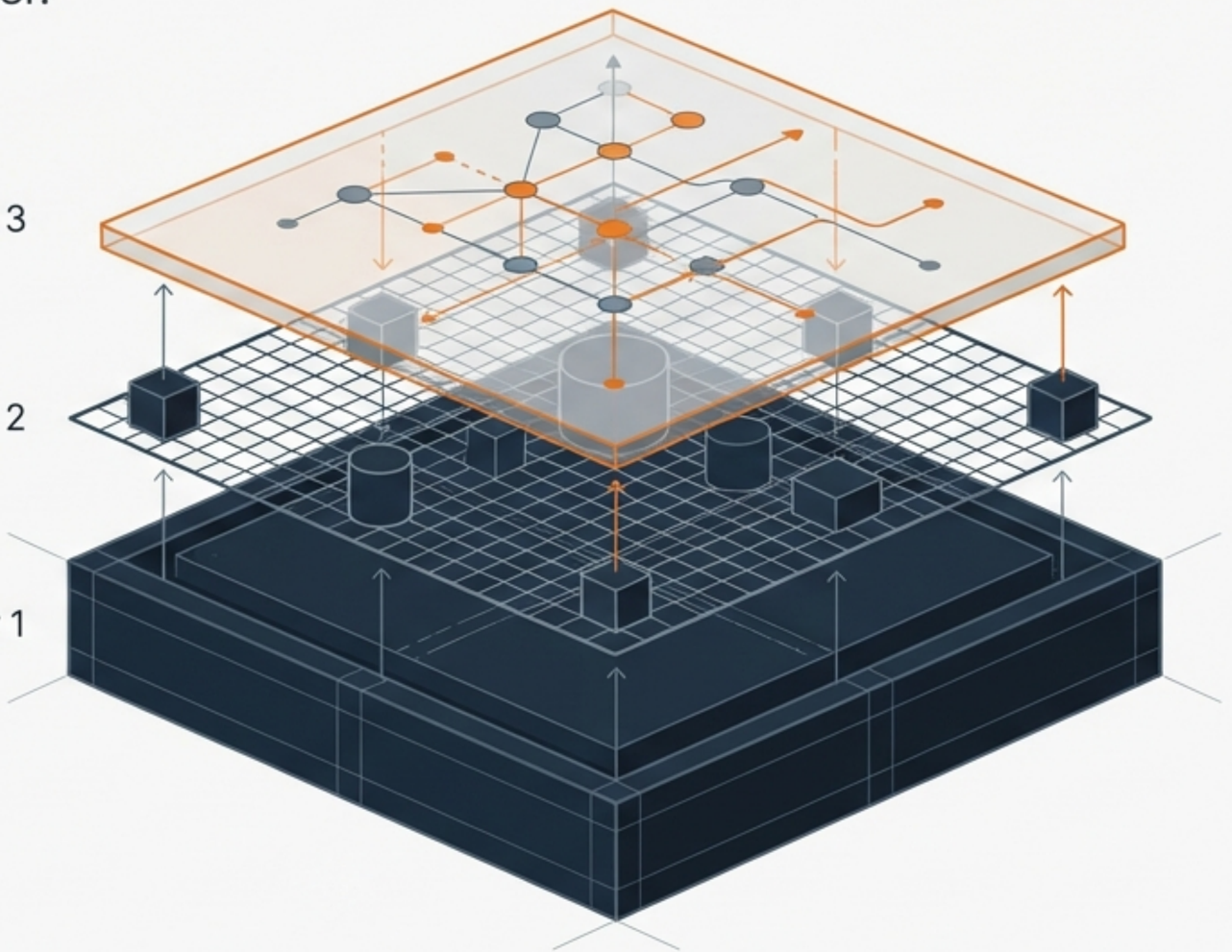
A Complete Vertical Stack for Production-Grade AI

OpenLink addresses the integration gap by starting where enterprise reality reality begins: the data access layer.

OpenLink AI Layer (OPAL) | Agents, Skills, Markdown, MCP — Layer 3

Virtuoso Data Spaces | Semantic Harmonisation, Loose Coupling, RDF — Layer 2

Universal Data Access (UDA) | ODBC, JDBC, Drivers, Control Plane — Layer 1



Supports:

SQL

SPARQL

HTTP

ODBC

JDBC

MCP

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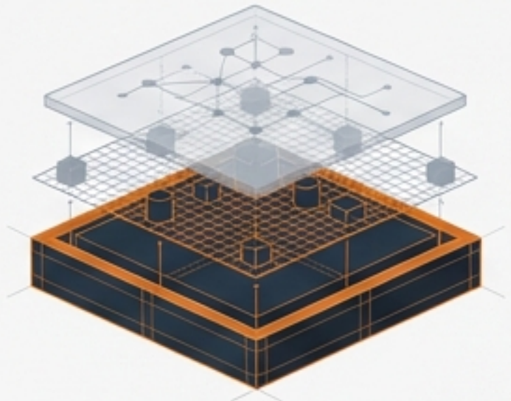
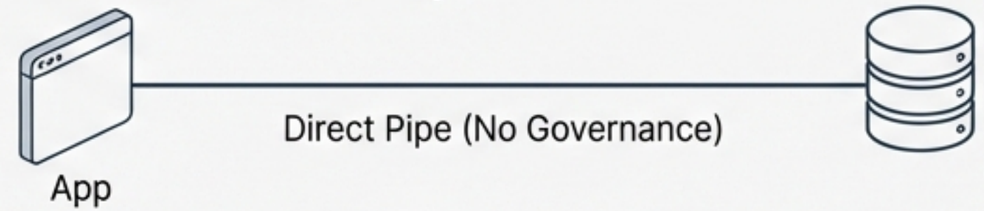
The Foundation: Universal Data Access (UDA)

True governance cannot be an afterthought; it must exist at the connection level. OpenLink UDA introduces a "Missing Control Plane" into standard ODBC/JDBC drivers.

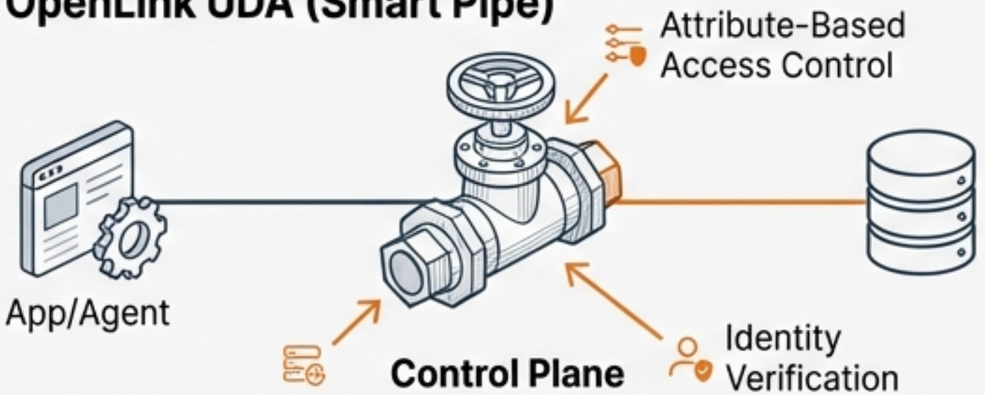


Standard vs. OpenLink

Standard Connectivity



OpenLink UDA (Smart Pipe)



Technical Detail:

- **DBMS-Agnostic Connectivity:** High-performance drivers for heterogeneous environments.
- **The Control Plane:** Enforces fine-grained policies directly at the driver level.
- **Impact:** Legacy apps and AI agents are subject to the same enforceable policies.

ODBC JDBC SQL

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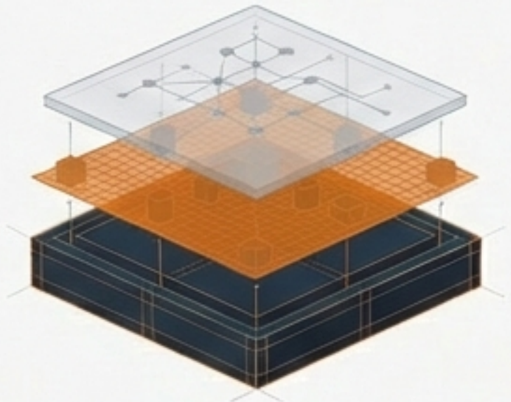
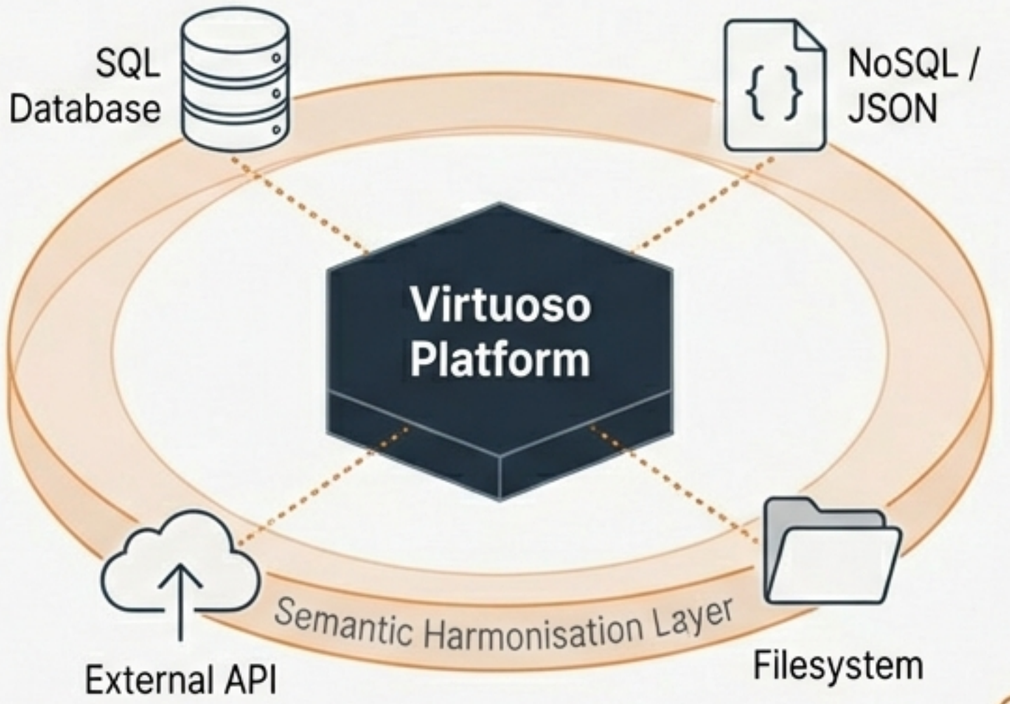
The Substrate: Virtuoso Data Spaces

Turning fragmented systems into a coherent substrate without forced migration.
Virtuoso creates a “Knowledge Graph” view of existing infrastructure.





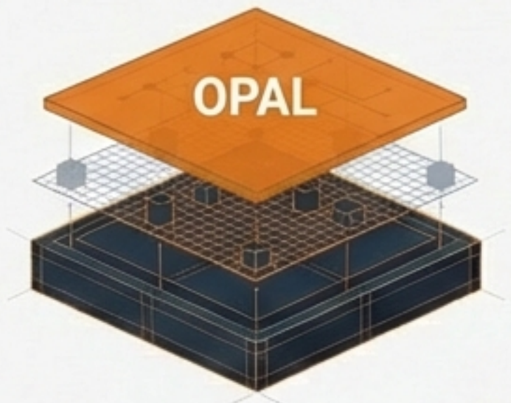
Technical Detail:

- **Loose Coupling:** Data remains in its original source but becomes interoperable.
- **Semantic Harmonisation:** Assets are exposed through a unified, standards-based interface.
- **Result:** Disparate sources become queryable as a single logical unit.

SPARQL RDF HTTP DAV

The Intelligence: OpenLink AI Layer (OPAL)

Agents as first-class citizens, defined in natural language and operating on governed data.




```
# Agent: FinancialAnalyst

Description: Analyzes Q3 revenue trends.

Skills:
  - query_database(target='sales_db')
  - generate_report(format='pdf')

Policy: ReadOnly
```

Technical Detail:

- **Markdown Definition:** Agents and skills are deployed using simple natural language.
- **Standards-Based:** Utilizes MCP (Model Context Protocol), OpenAPI, and A2A.
- **Execution:** Skills execute against the harmonised data layer, inheriting UDA security.

MCP | OpenAPI | A2A

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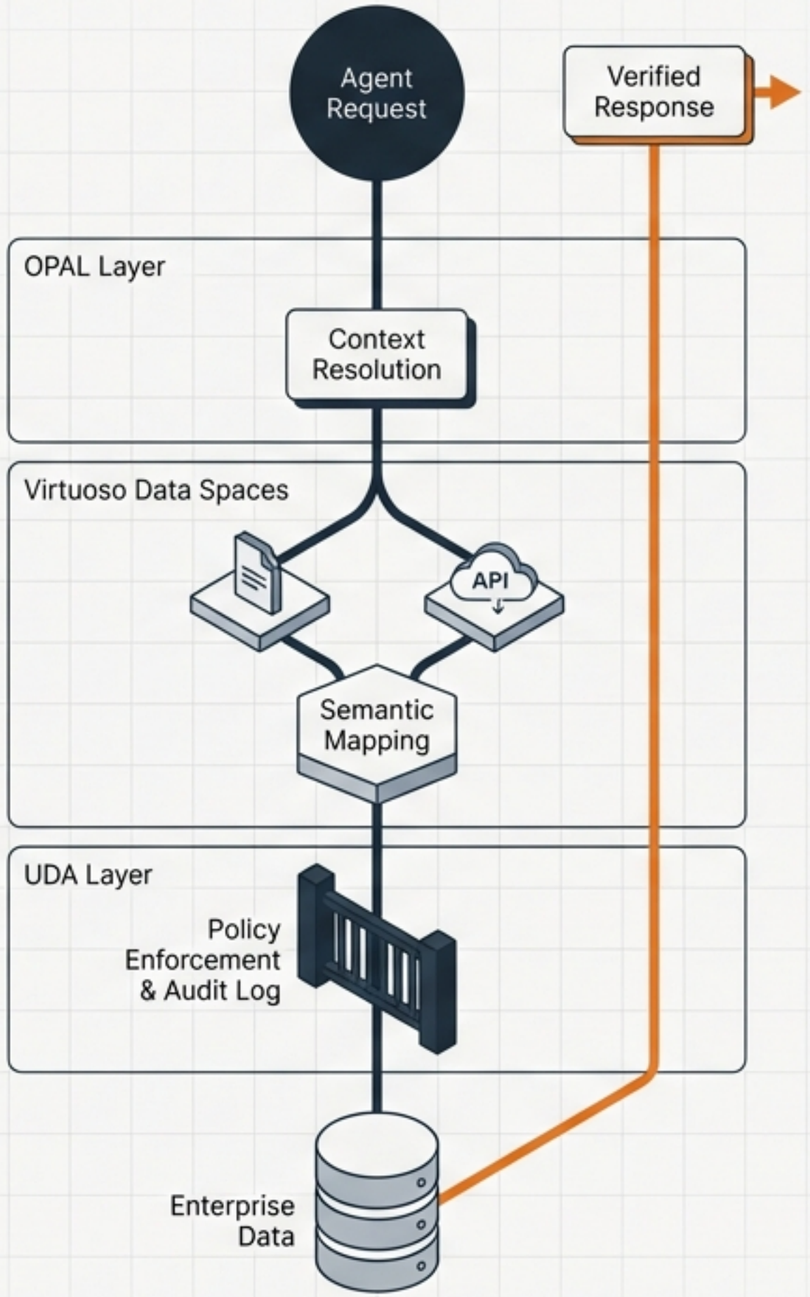
The Vertical Advantage: Coherence and Auditability

By integrating the stack, we eliminate the fragility of “bolted-on” security.



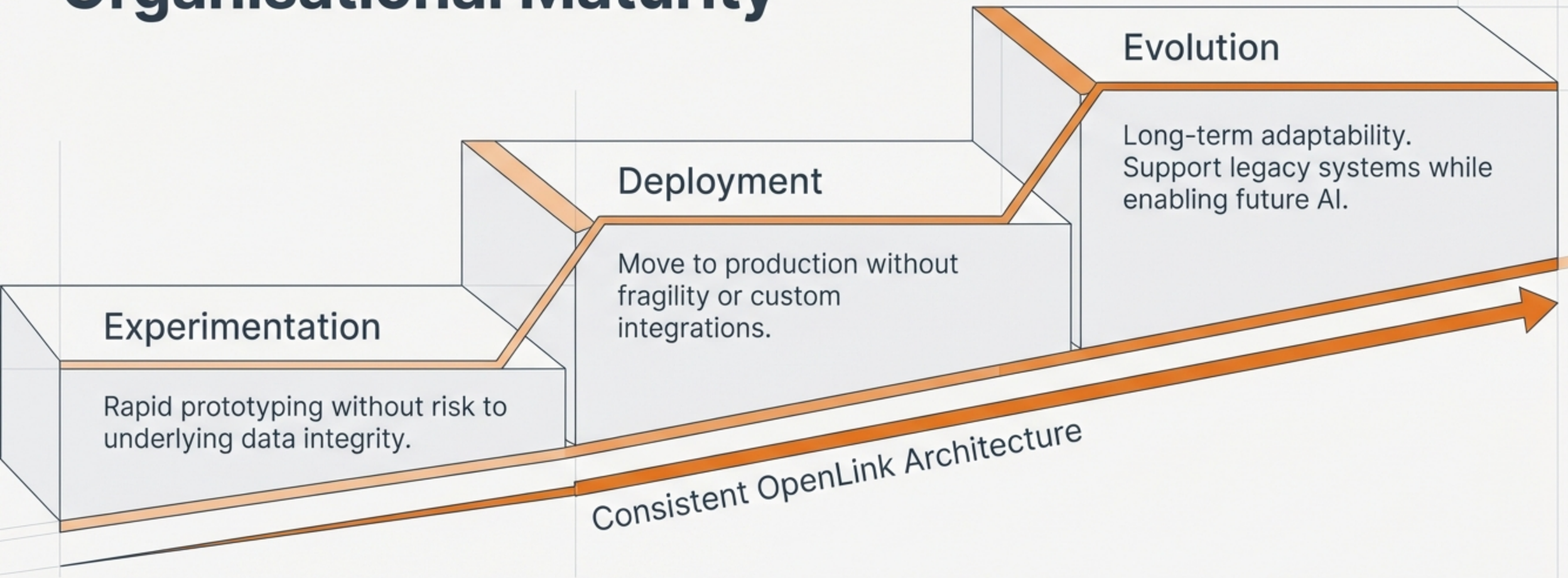
The Workflow:

1. **Reasoning:** Agents reason over live enterprise data.
2. **Action:** Actions are coordinated via established standards.
3. **Audit:** Every request flows through the UDA layer, creating a persistent audit trail.

Key Takeaway:

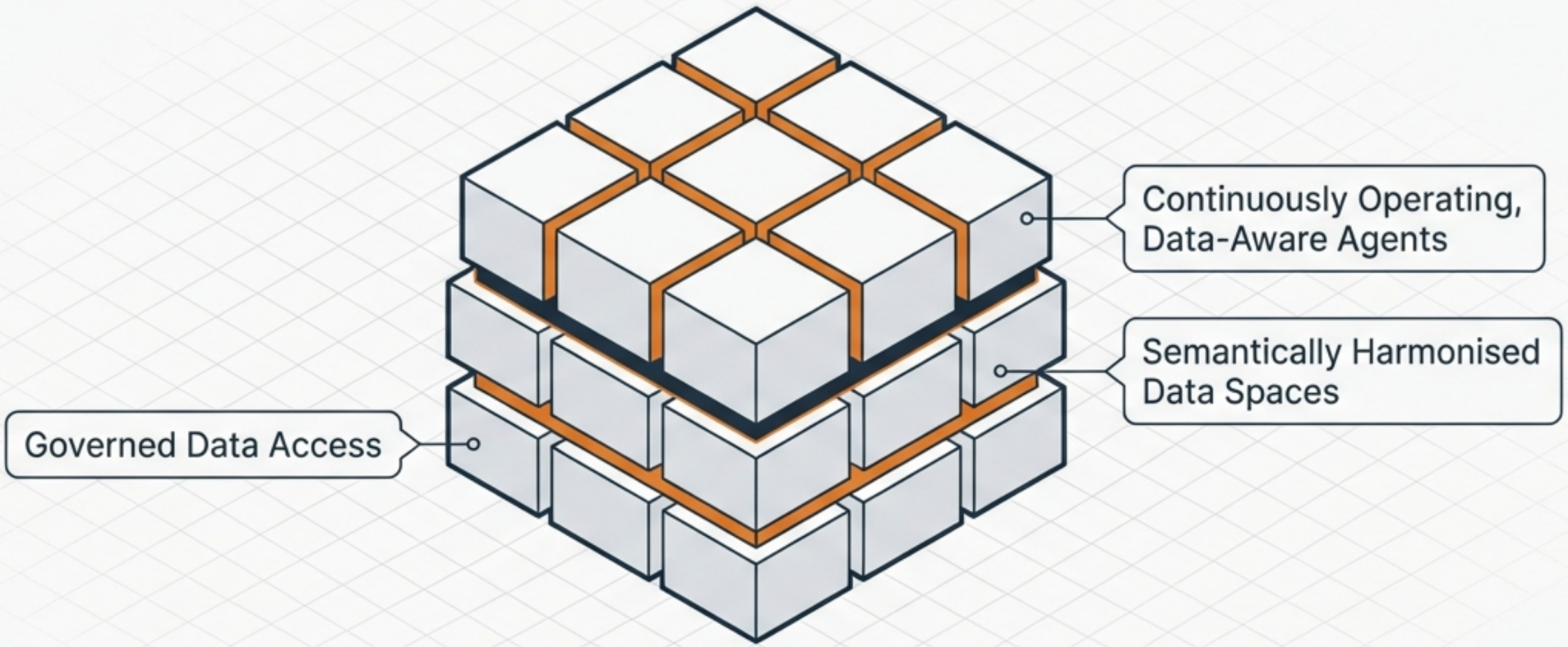
This is the only path to Production-Grade systems. It removes the need for brittle prompt engineering to solve security problems.

Scaling Across Organisational Maturity



Alignment: The platform aligns AI adoption with the way enterprises *already* manage data, security, and operations. It supports experimentation without risking compliance.

A Coherent Narrative for the AI-Enabled Enterprise



The Outcome: AI systems that enterprises can trust to reason, decide, and act at scale. OpenLink delivers the end-to-end architecture required for the next decade of automation.

Contact OpenLink Software to begin the architectural transition.