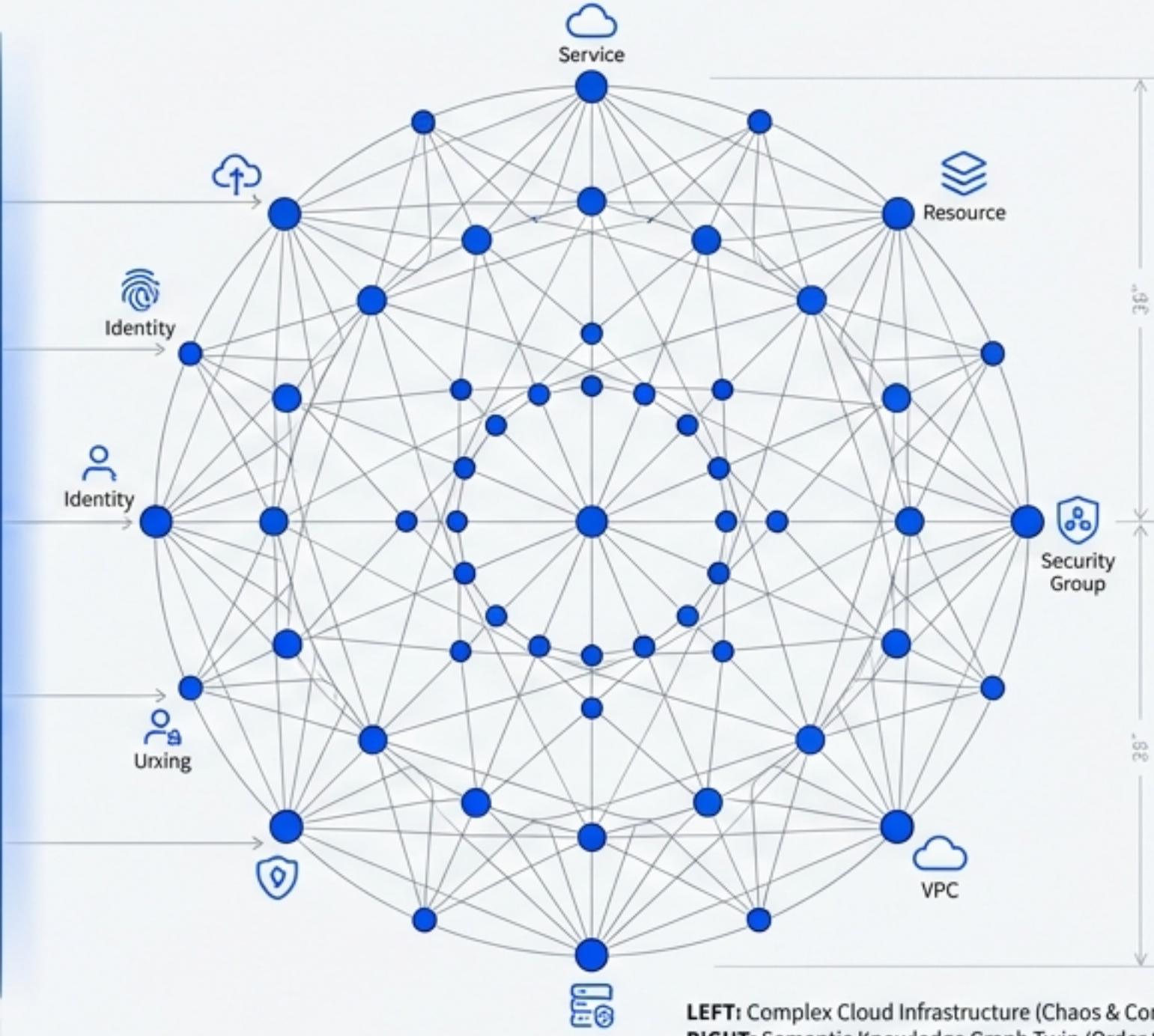
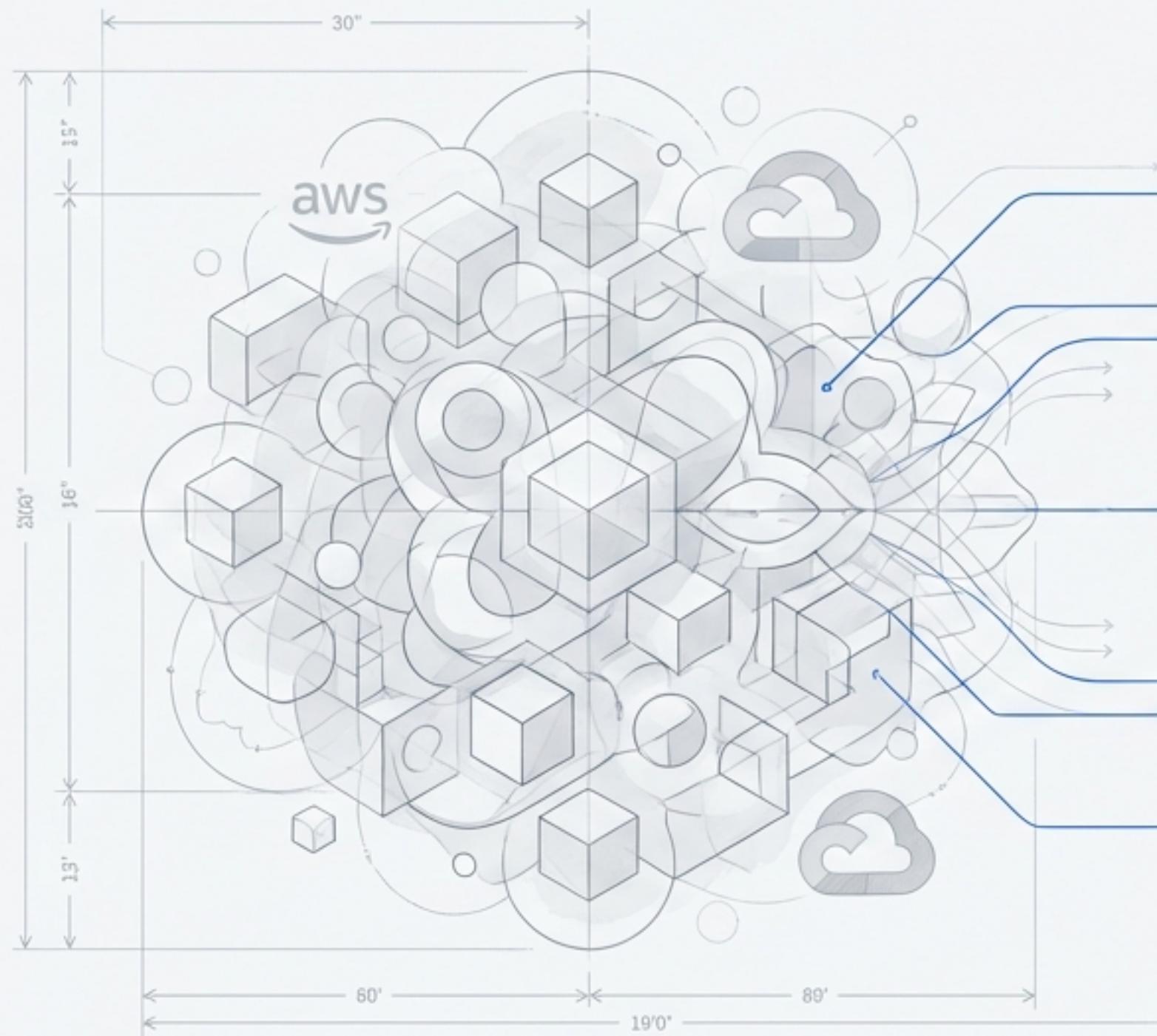


GenCloudTwin: Your Cloud's Living Replica

A Digital Twin for Cloud Infrastructure built on Semantic Knowledge Graphs.

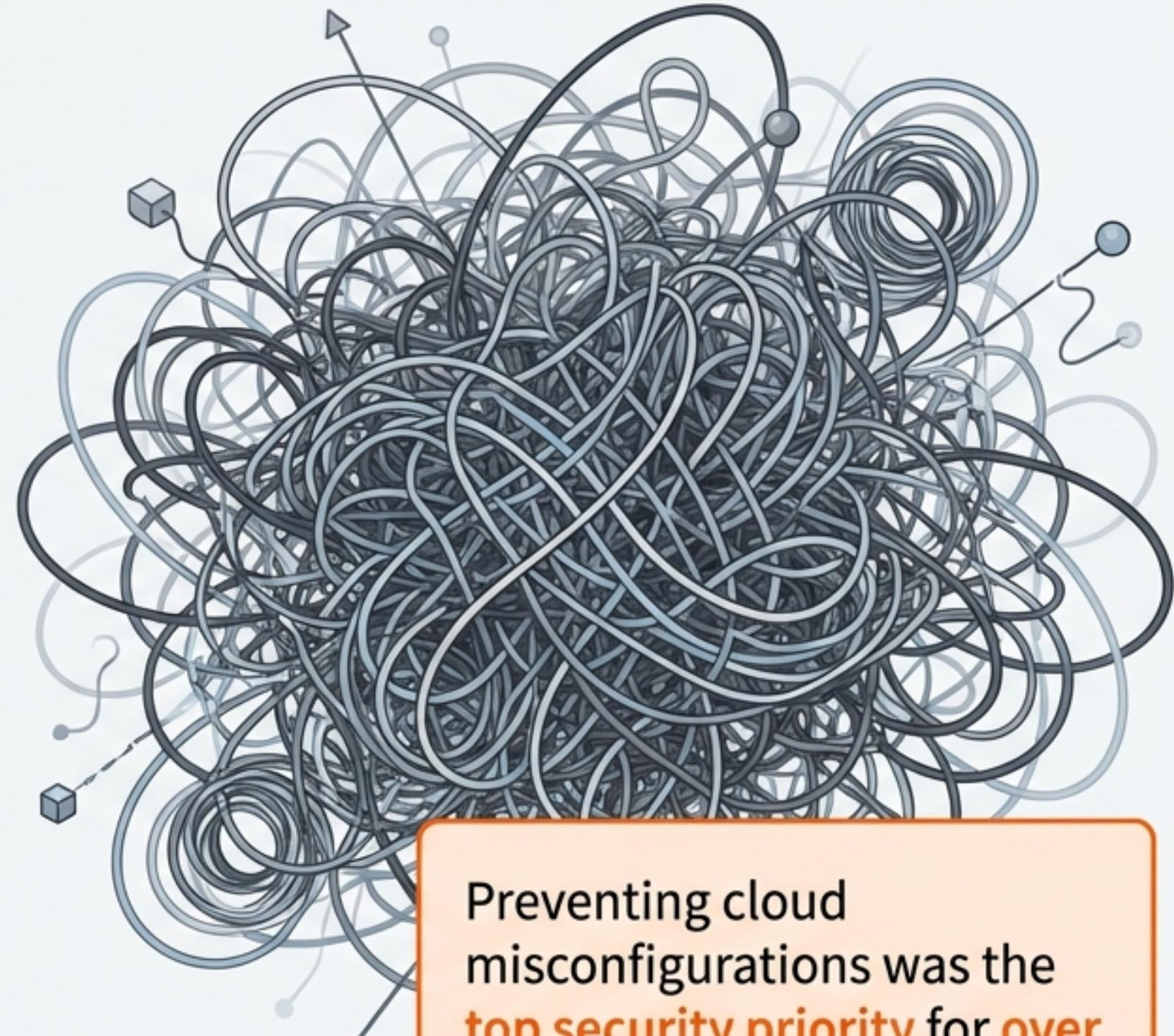


LEFT: Complex Cloud Infrastructure (Chaos & Complexity)
RIGHT: Semantic Knowledge Graph Twin (Order & Clarity)
CENTER: Transformation & Mirroring (Blueprint Process)

Modern Cloud Environments are a Black Box of Complexity

As infrastructure scales, visibility shrinks. Answering fundamental questions about security, cost, and dependencies becomes nearly impossible due to fragmented data across hundreds of services and APIs.

- Cloud accounts contain hundreds of interdependent resources: compute, storage, networking, and identities all connected in non-obvious ways.
- Configuration changes happen rapidly, making documentation and manual diagrams instantly obsolete.
- Critical information is siloed: IAM policies in one place, network ACLs in another, billing data elsewhere.



Preventing cloud misconfigurations was the **top security priority** for **over half** of companies.

The Solution is a Proven Concept: The Digital Twin

Originally pioneered by NASA for simulating spacecraft, a digital twin is a living, **virtual** representation of a **real-world system**. It connects disparate data points to create a unified model for insightful decision-making.



The “Real-World System”

Your entire AWS, Azure, or GCP account's state.

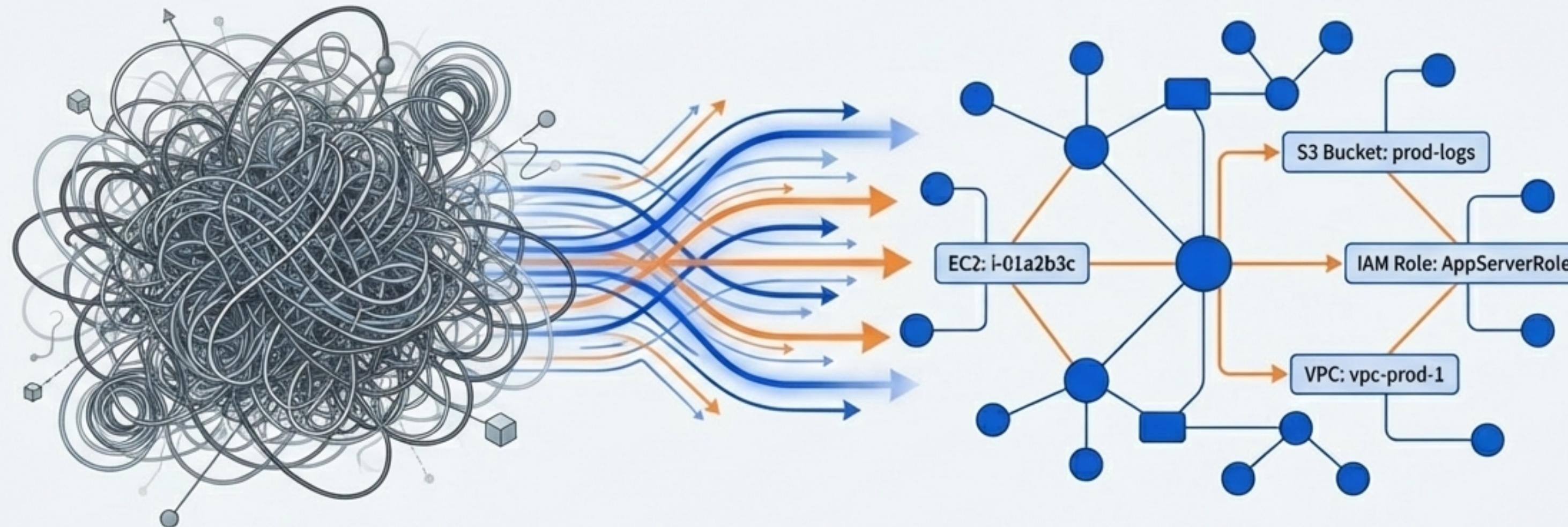
The “Digital Twin”

A complete, point-in-time digital replica, continuously updated with configuration data.

The Value

It breaks down data silos by aggregating and interlinking all configuration data into one consistent, queryable model.

Introducing GenCloudTwin: A Semantic Replica of Your Cloud



GenCloudTwin is a cloud-agnostic digital twin that automatically captures all cloud resources, configurations, identities, and their relationships in a rich, semantic knowledge graph.

It provides a living, queryable mirror of your environment, allowing you to:

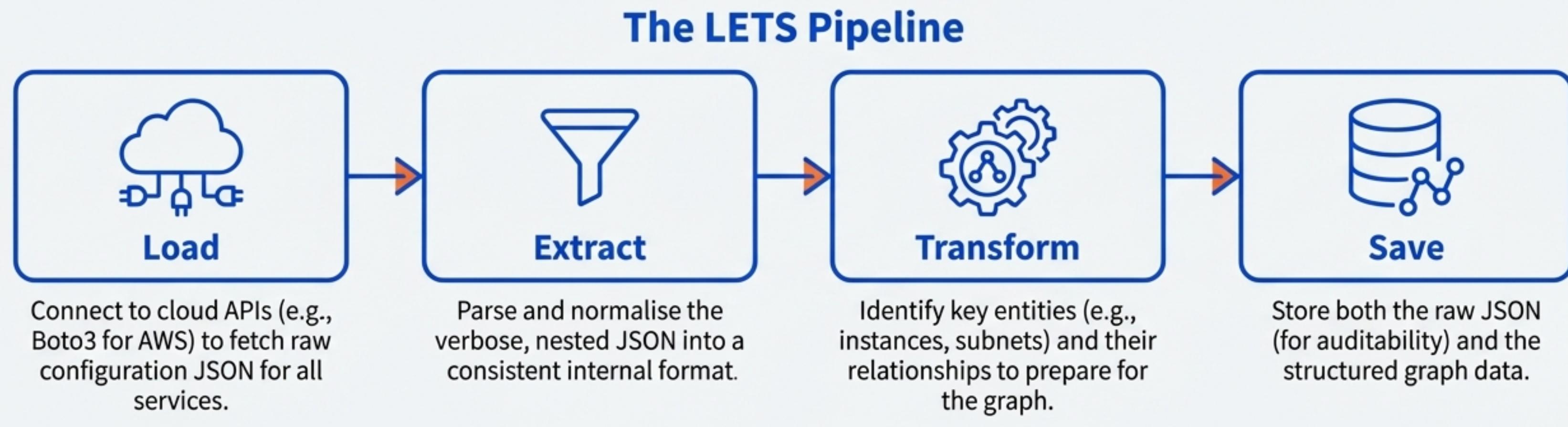
Visualise your complete architecture.

Analyse complex relationships and hidden dependencies.

Run powerful simulations on a safe, offline copy.

How It's Built, Part 1: Automated Data Ingestion

Creating a complete, point-in-time snapshot of your cloud account.



The snapshot captures everything:

- ✓ IAM (Users, Roles, Policies)
- ✓ Compute (Instances, Clusters, Functions)
- ✓ Storage & Databases (Buckets, Volumes)
- ✓ Networking (VPCs, Subnets, Security Groups)
- ✓ And more...

How It's Built, Part 2: Constructing the Semantic Graph

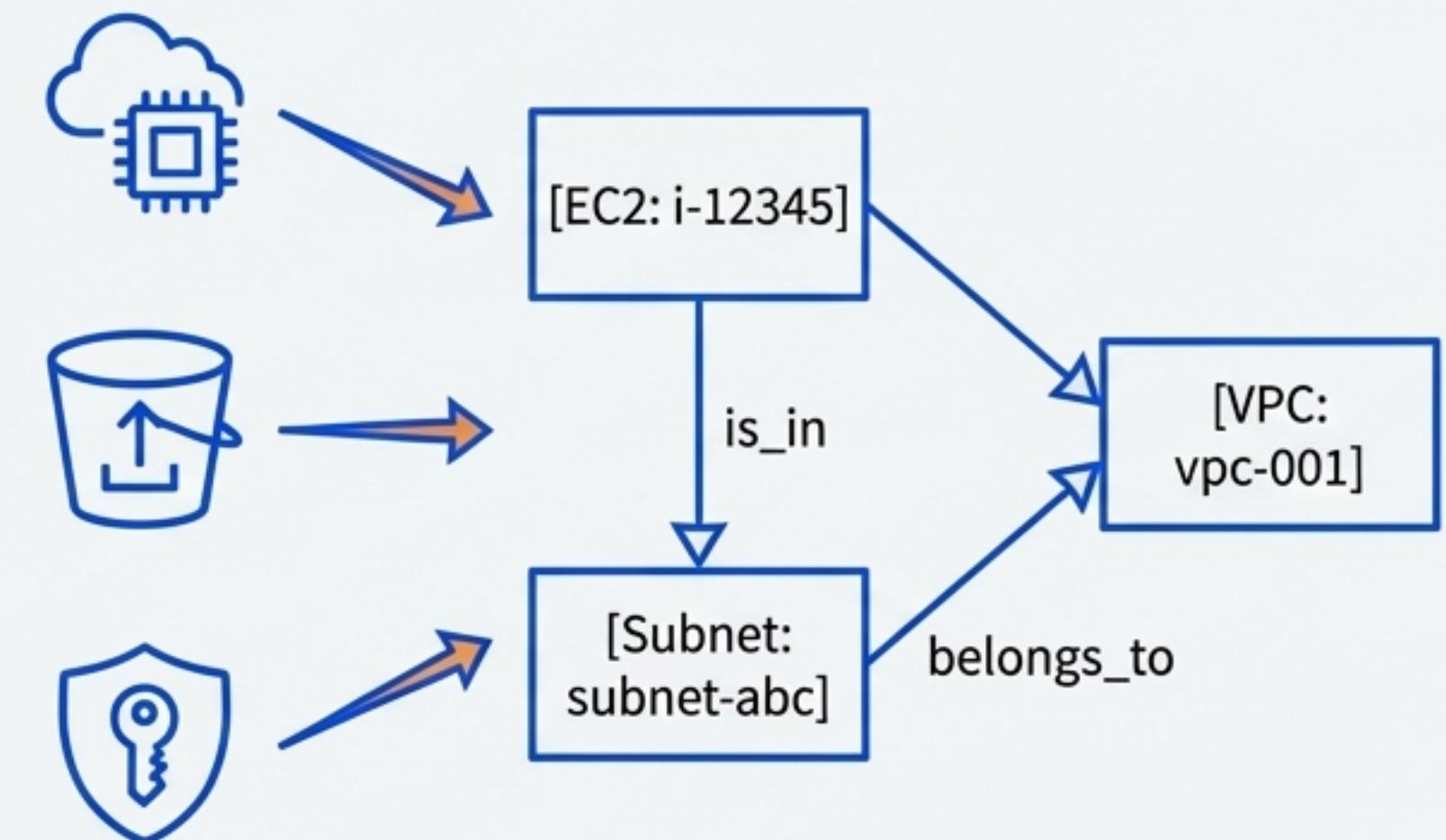
We don't just list resources; we model their relationships and meaning.

What is a Semantic Graph?

- Each cloud object becomes a **node** (e.g., an EC2 instance).
- Relationships become labeled **edges** (e.g., [EC2 Instance] --- uses_role ---> [IAM Role]).
- Nodes and edges are given semantic meaning, encoding domain knowledge about cloud concepts (e.g., an EC2 instance *is a type of* Compute Resource).

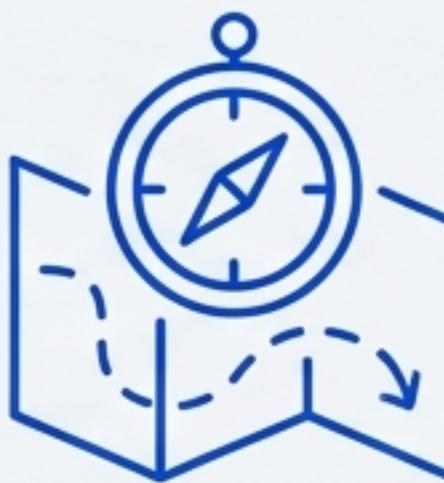
Contextual Enrichment

- Tagging a security group with `PubliclyAccessible` if it contains a 0.0.0.0/0 rule.
- Adding cost data (e.g., hourly rate) directly to compute resource nodes.



From Insight to Action: The Five Pillars of Value

The knowledge graph is not just a model; it's an engine for unlocking powerful capabilities across your cloud operations. We will explore five key use cases.



1. Visualise & Explore

From Chaos to Clarity



2. Security Analysis

See Through an Attacker's Eyes



3. Cost Optimisation

Turn Bills into Intelligence



4. Simulations

Your Cloud's Flight Simulator



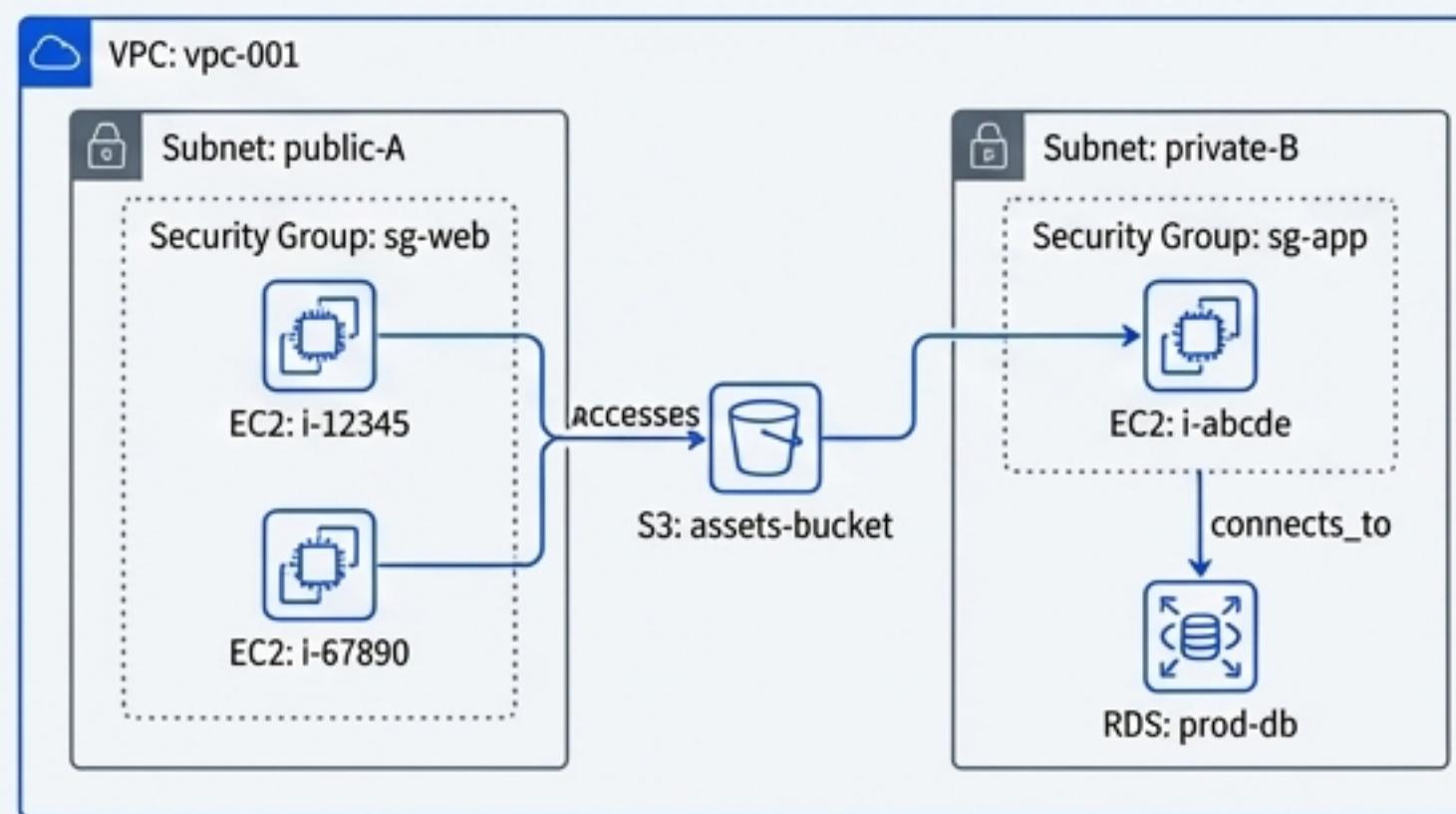
5. Compliance & Recovery

The Blueprint for Resilience

Gaining Clarity and Seeing Through an Attacker's Eyes

Pillar 1: Visualise & Explore (From Chaos to Clarity)

- Automatically generate always-up-to-date architecture diagrams.
- Interactively traverse resource relationships to understand hidden dependencies.
- Accelerate troubleshooting and new engineer onboarding.



Pillar 2: Security Posture Management (See Through an Attacker's Eyes)

Identify Misconfigurations

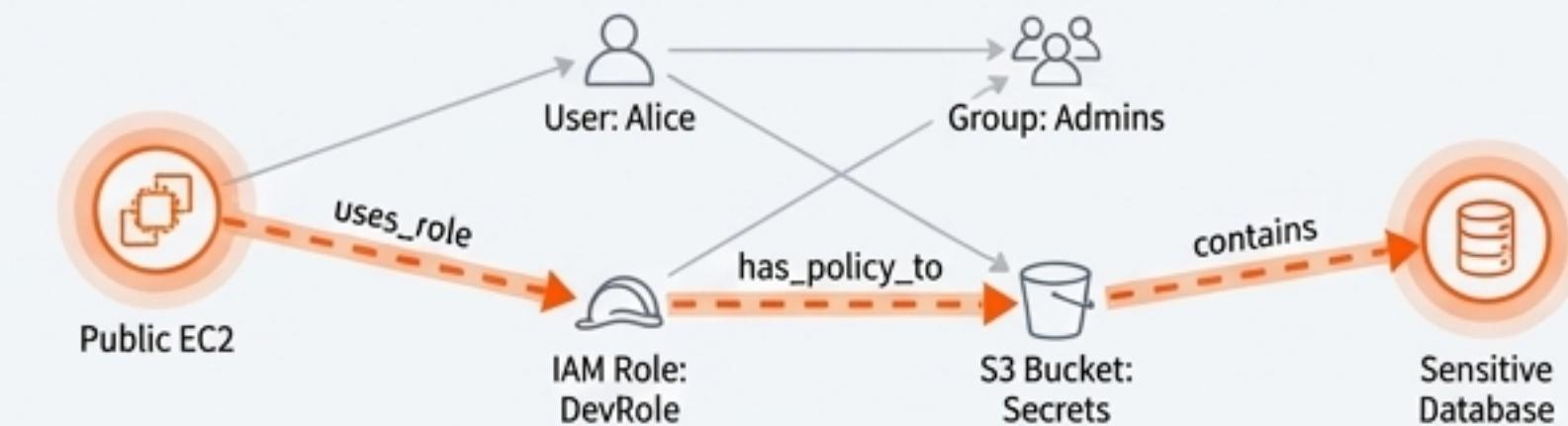
- Run graph queries to find risky patterns like public S3 buckets, overly permissive IAM roles, or open security groups.

Analyse Attack Paths

- Simulate a compromised node and use graph traversal to discover potential lateral movement and blast radius before an attacker does.

Unified Identity Governance

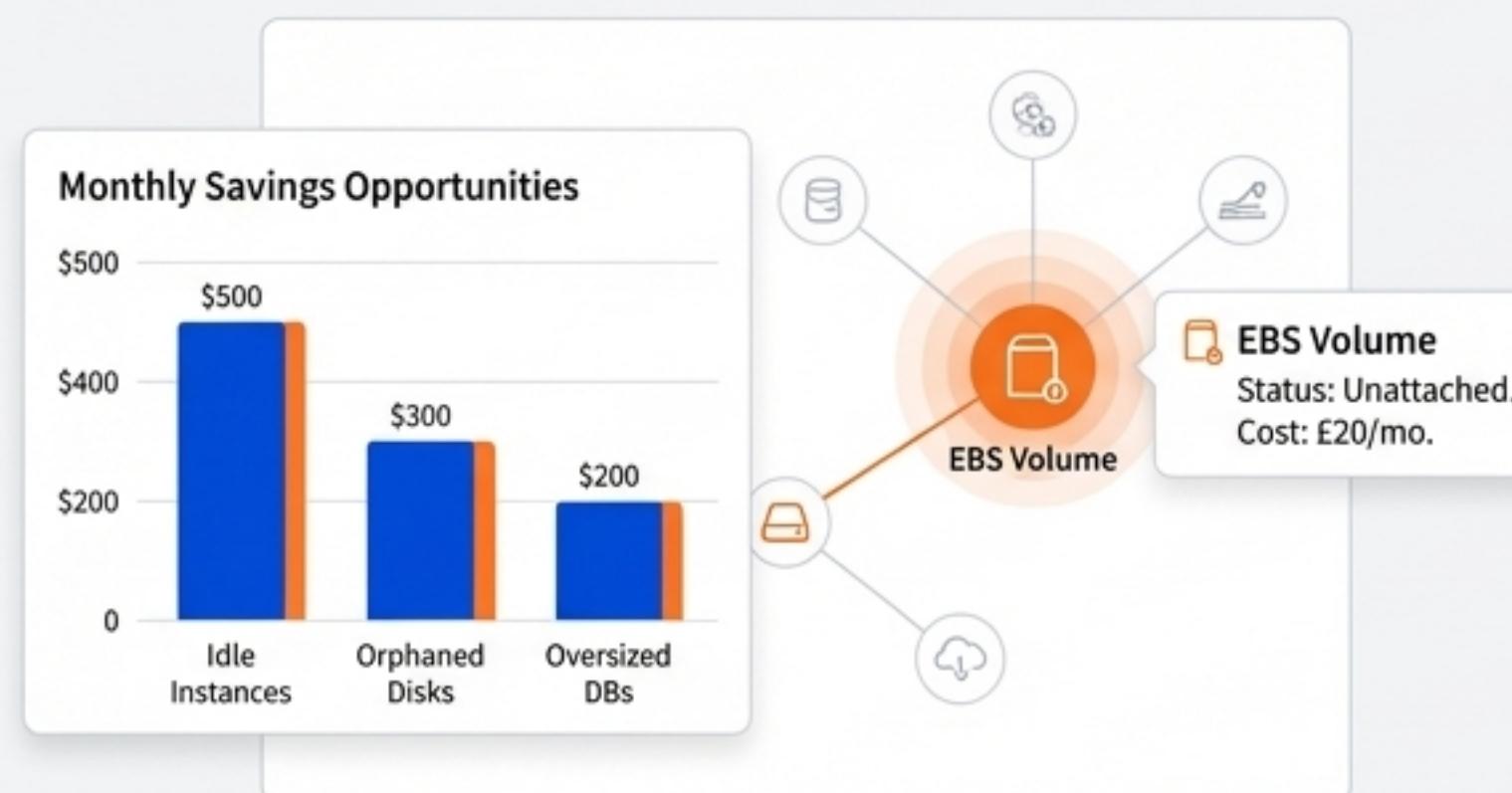
- Get a single view of who can access what across the entire environment.



Turning Bills into Intelligence and Simulating Change Safely

Pillar 3: Cost Optimisation (Turn Bills into Intelligence)

- Map costs directly to architectural components, not just line items on a bill.
- Systematically discover waste by querying for idle or orphaned resources (e.g., unattached EBS volumes, underutilised instances).
- Accurately forecast the cost impact of architectural changes.



Pillar 4. 'What-If' Scenarios (Your Cloud's Flight Simulator)

Failure Simulations

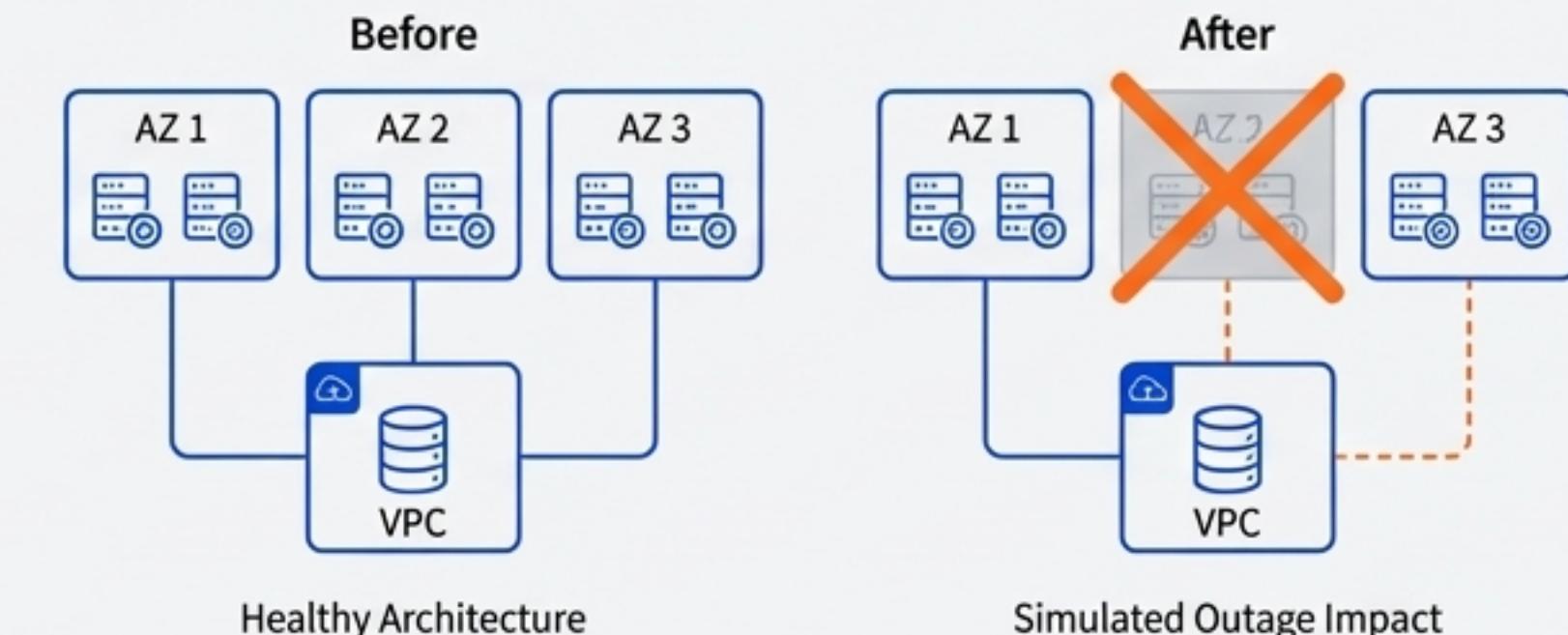
- Safely model an availability zone outage in the twin to test resilience and identify single points of failure.

Change Validation

- Preview the impact of a new firewall rule or the decommissioning of a server before applying it to production.

Cost & Scale Projections

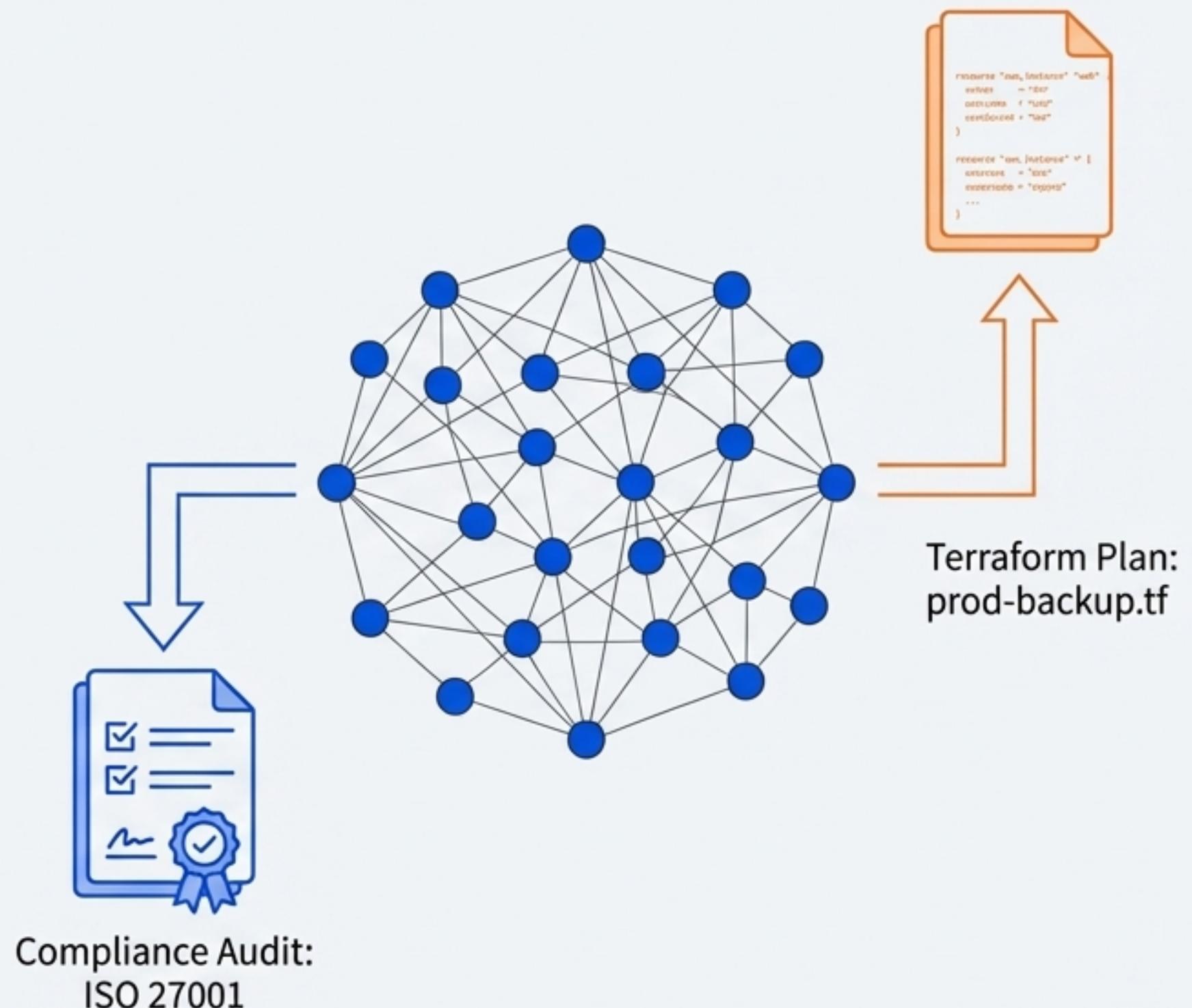
- Simulate doubling your application servers and see the projected impact on cost and service limits.



Your Environment's Blueprint for Resilience and Compliance

Pillar 5: Backup, Recovery & Compliance

- **A Living Blueprint:** The twin serves as the definitive record of your environment's last known-good state, essential for disaster recovery.
- **Automated Documentation:** Fulfill compliance requirements by querying the twin to produce reports on system architecture, data flows, and access controls.
- **Reverse-Engineer to IaC:** Generate Infrastructure-as-Code (e.g., Terraform) templates from the twin, creating a code-based backup even for manually created infrastructure.
- **Drift Detection:** Compare snapshots over time to automatically detect and flag unauthorised or unintended changes to your configuration baseline.



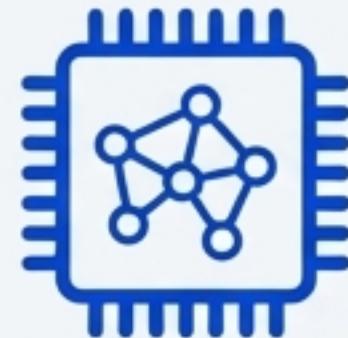
The Technology Foundation: More Than Just a Script

GenCloudTwin is built on a set of robust, open-source design principles.



Semantic Knowledge Graph

Unlike a simple inventory, the graph unifies data with context, enabling deep, insightful queries that break down silos.



MemoryFS & GraphFS

Custom storage abstractions provide a flexible and high-performance way to handle cloud data as a uniform graph, running in-memory or on a dedicated DB.



Full Provenance

Every piece of information in the twin is traceable back to the source API call and timestamp, ensuring trust and auditability.



Open-Source & Extensible

Built on open standards for community collaboration, customisation, and self-hosting, avoiding vendor lock-in.

The Future is Conversational: An AI Co-Pilot for Your Cloud

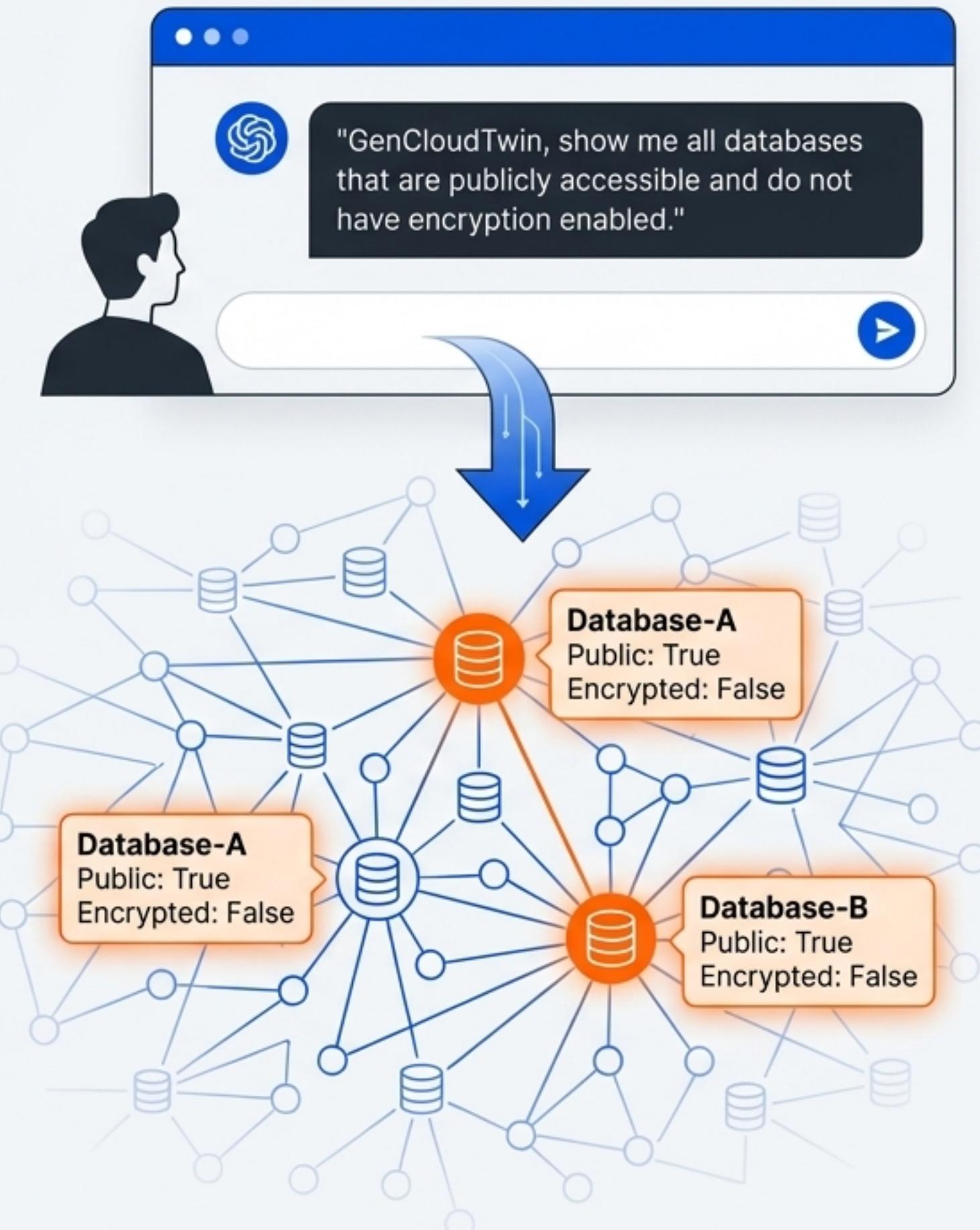
Leveraging the power of LLMs and knowledge graphs to transform cloud operations.

The Next Evolution

The structured knowledge graph provides the perfect grounding data for Large Language Models (LLMs), preventing factual 'hallucinations'.

Future Capabilities

- ✓ **Natural Language Queries:** Ask complex questions in plain English and get immediate, accurate answers from the twin.
- ✓ **Automated Remediation:** Ask the LLM to not only find a misconfiguration but also suggest the code or CLI command to fix it.
- ✓ **Proactive Insights:** An AI agent could constantly monitor the twin, surfacing risks or optimisation opportunities automatically.



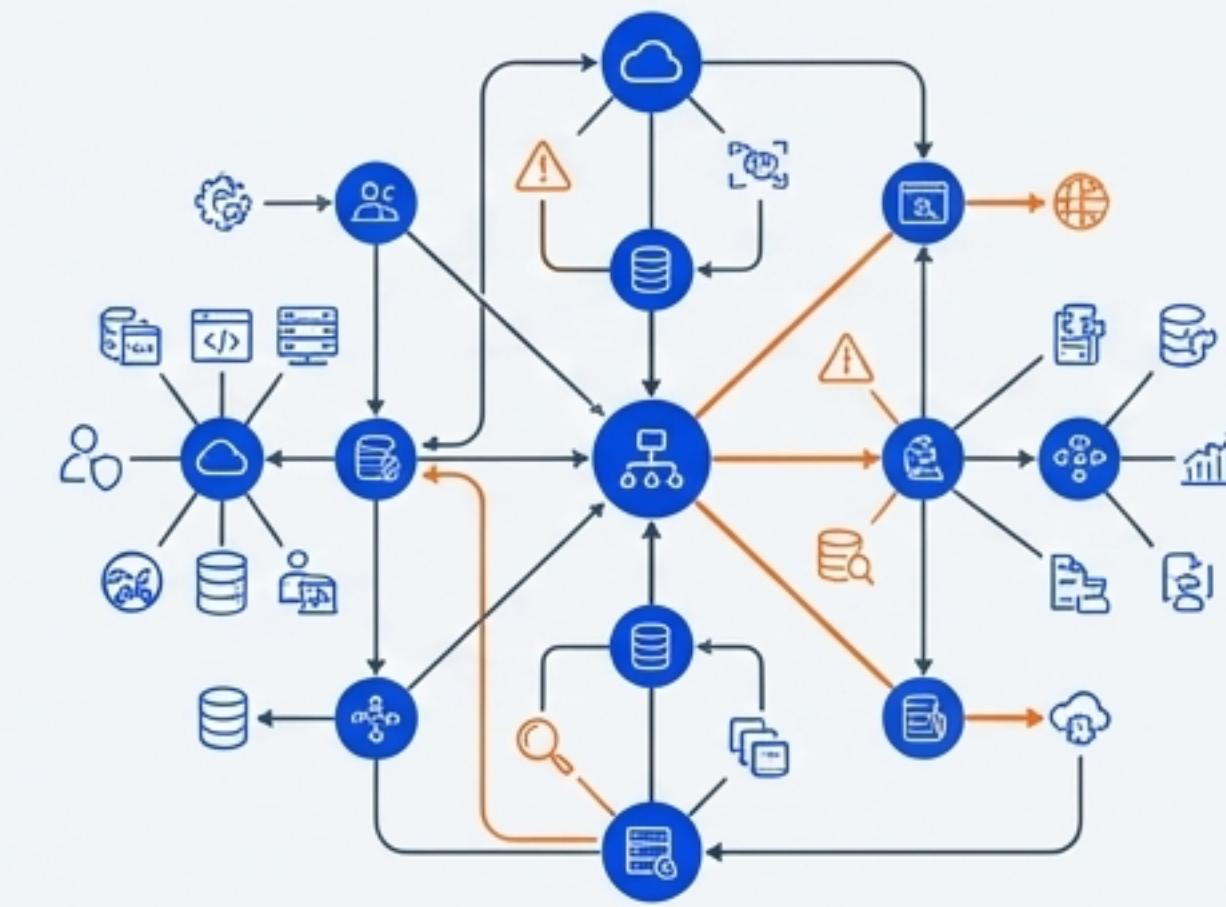
Taming the Chaos, From Reactive to Proactive

GenCloudTwin transforms cloud management into a data-driven science. By creating a living, semantic replica of your environment, it provides the visibility and foresight needed to build more resilient, efficient, and secure systems.

FROM: Ad-hoc, siloed management and reacting to outages or breaches.



TO: Proactive discovery of risks, safe simulation of changes, and continuous optimisation.



It provides a second set of eyes and a second brain for your cloud – meticulous, always up-to-date, and capable of seeing the big picture.