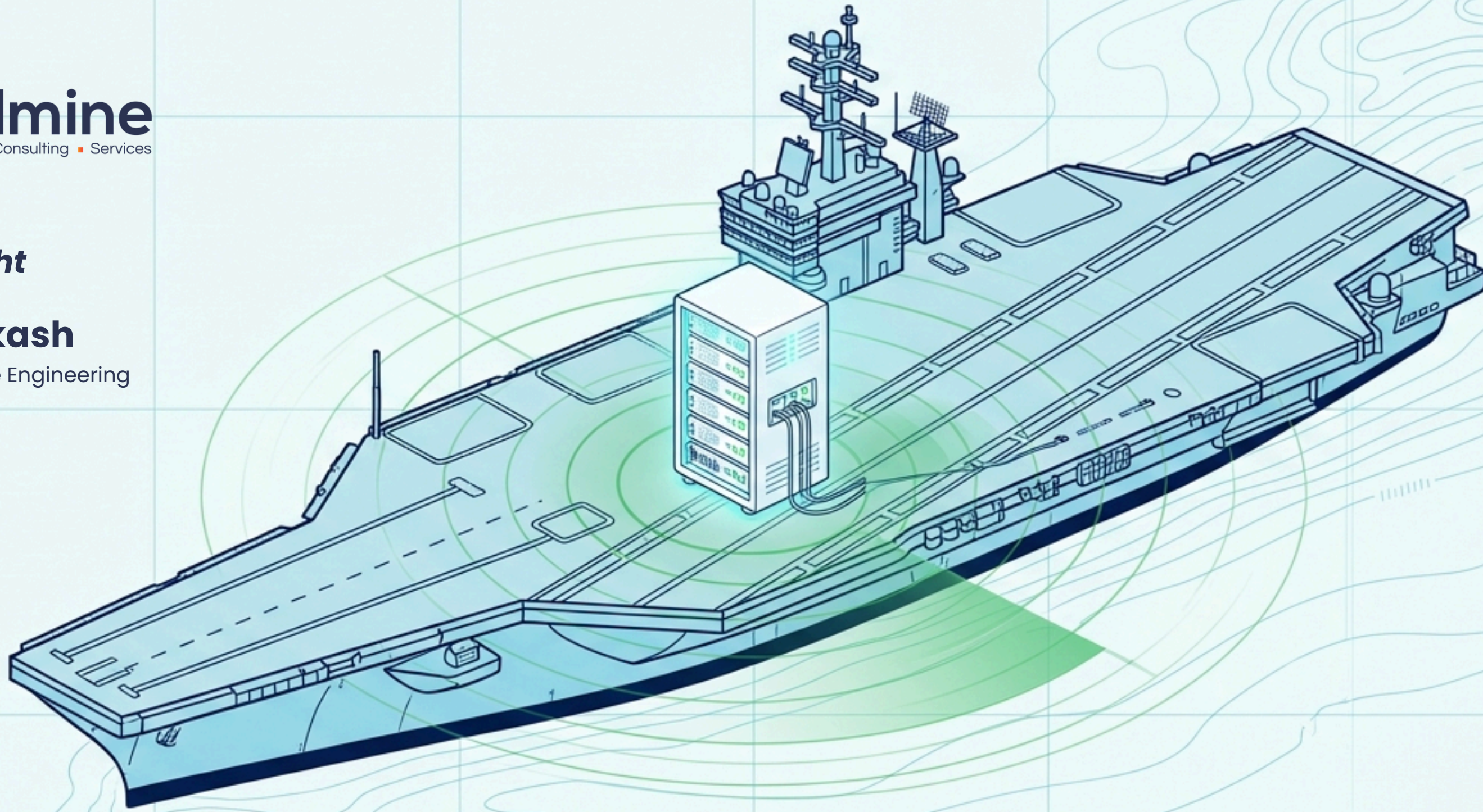


Expert Insight

Vimal Prakash

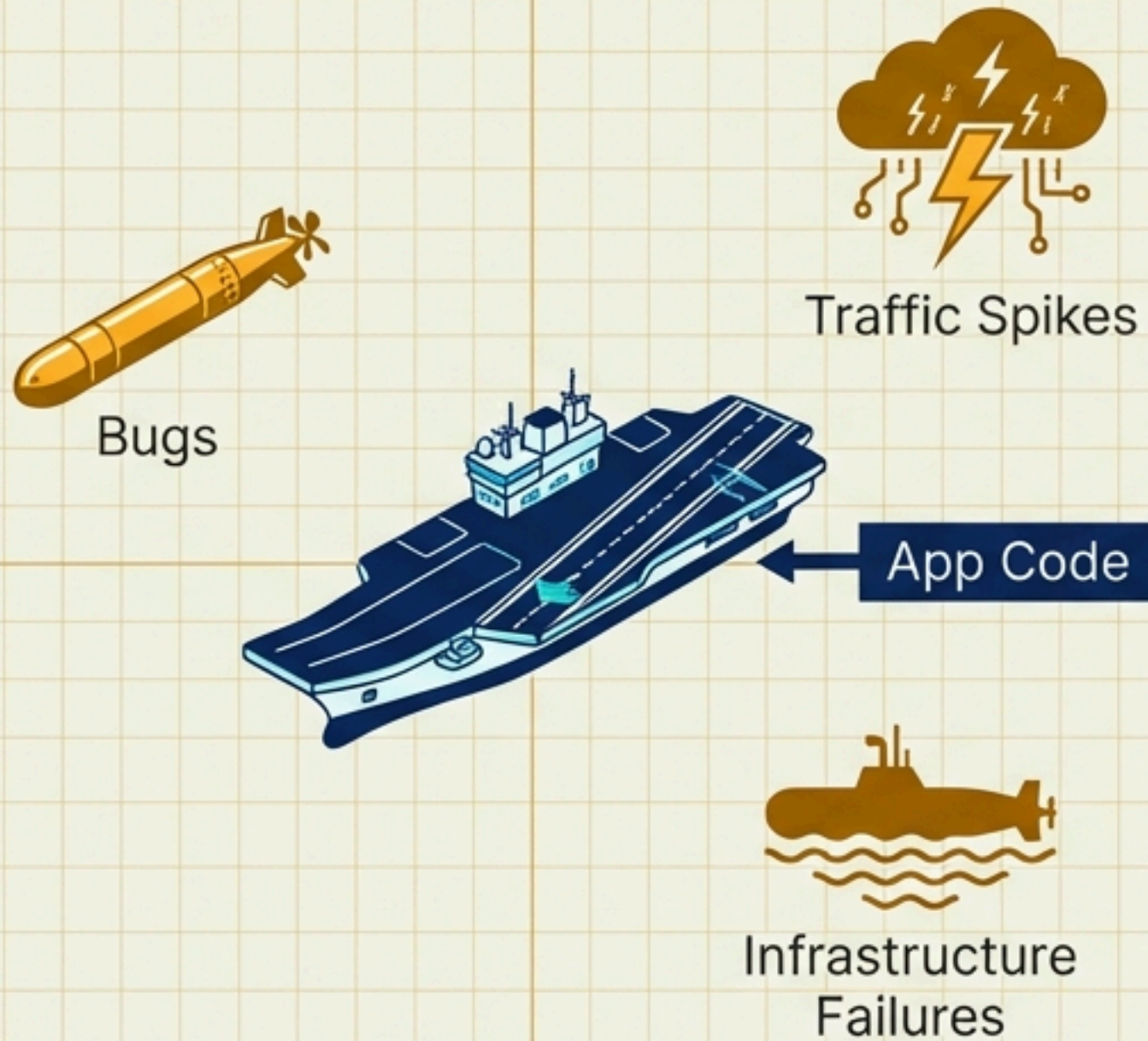
Director - Software Engineering



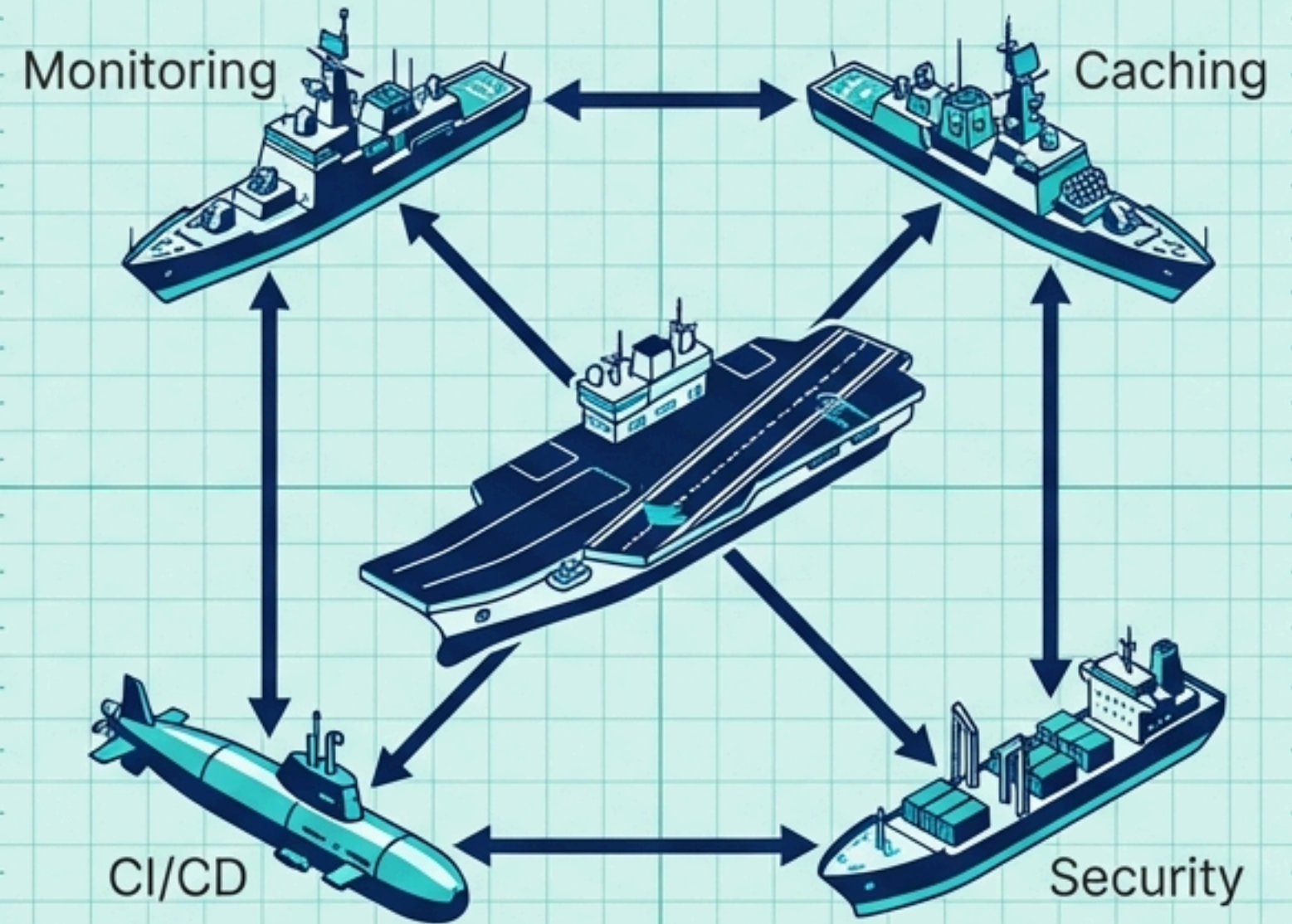
Ship the Battle Group

Application code alone cannot survive production. This is the definitive guide to resilient architecture, enterprise-grade engineering, and the 23-component ecosystem required to navigate hostile waters.

The Myth



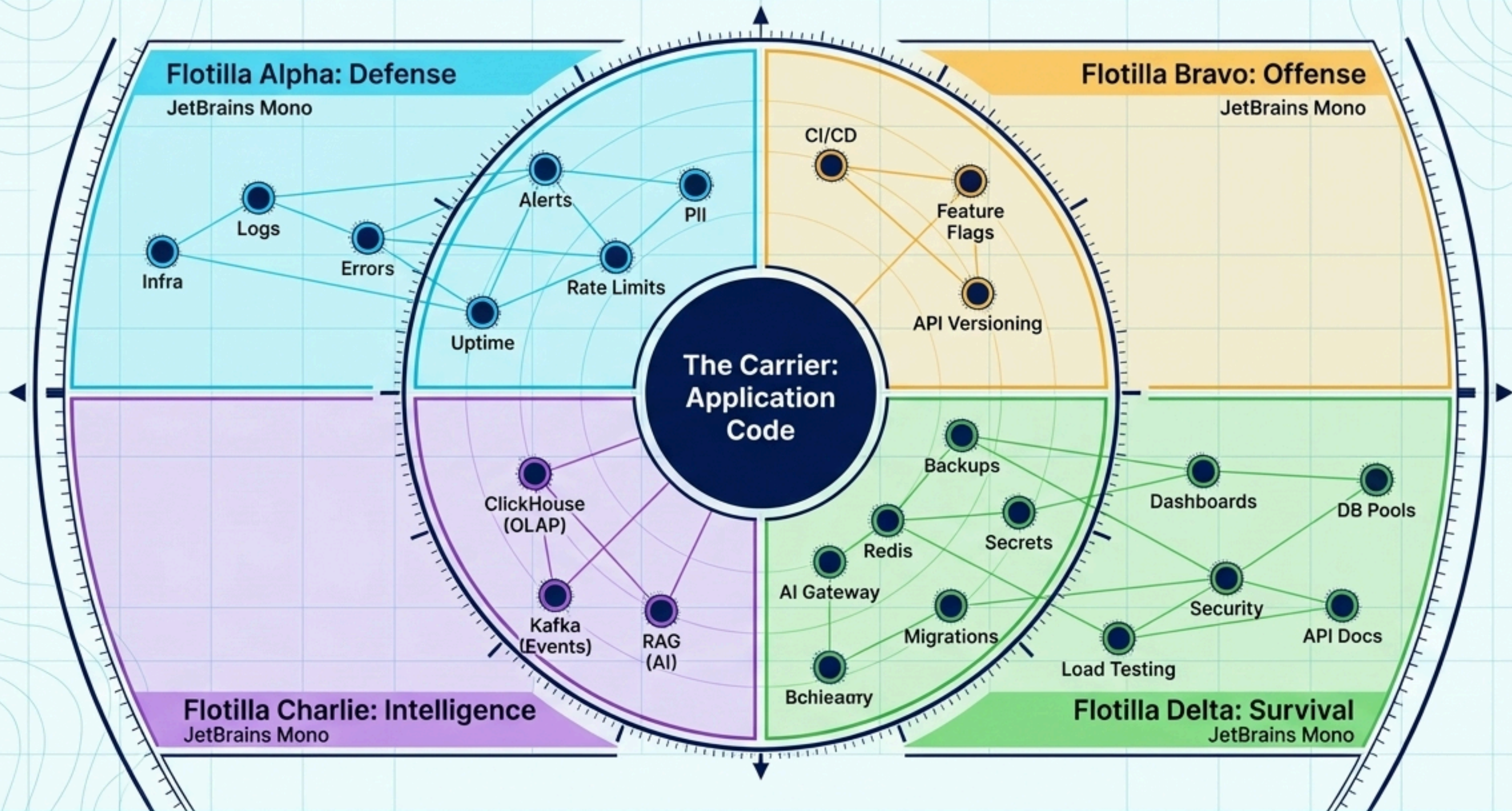
The Reality



INS Vikrant never sails alone. It deploys with destroyers, frigates, and submarines. **Do not ship the application code alone. Ship the battle group.**

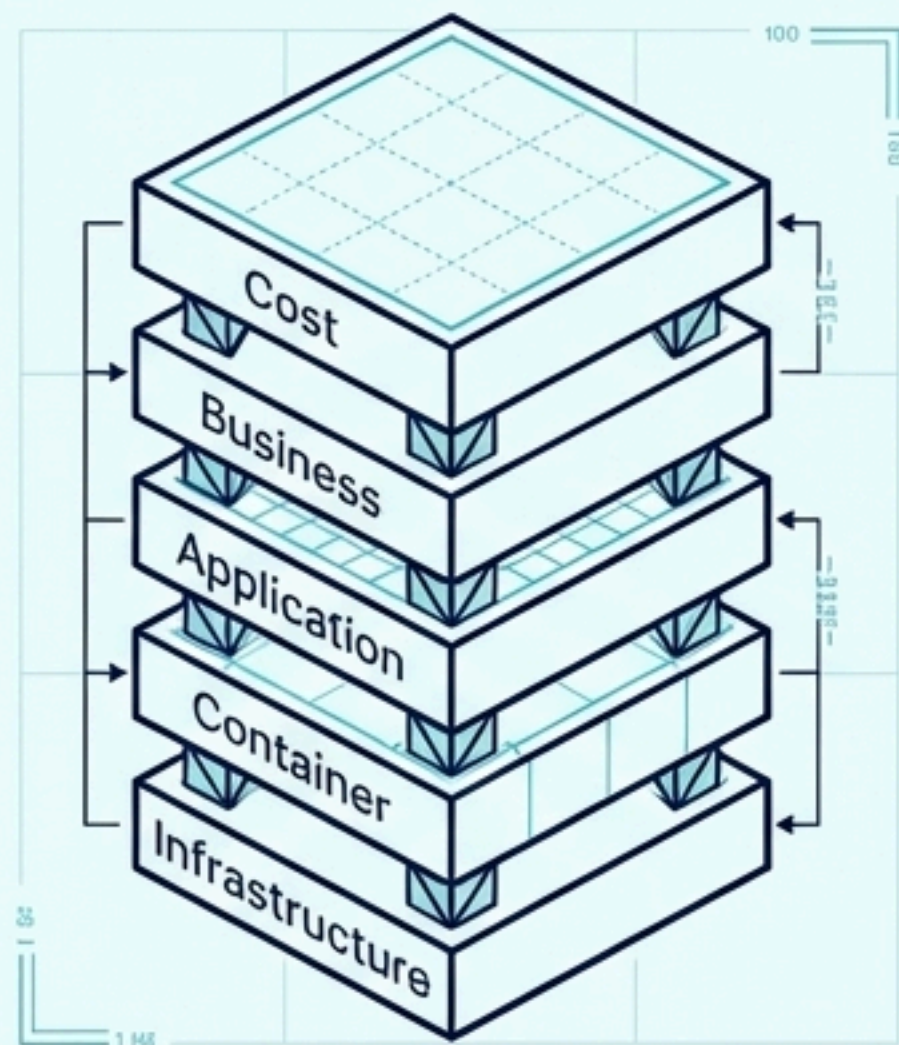
The Fleet Manifest

23 essential components organized into four tactical flotillas.

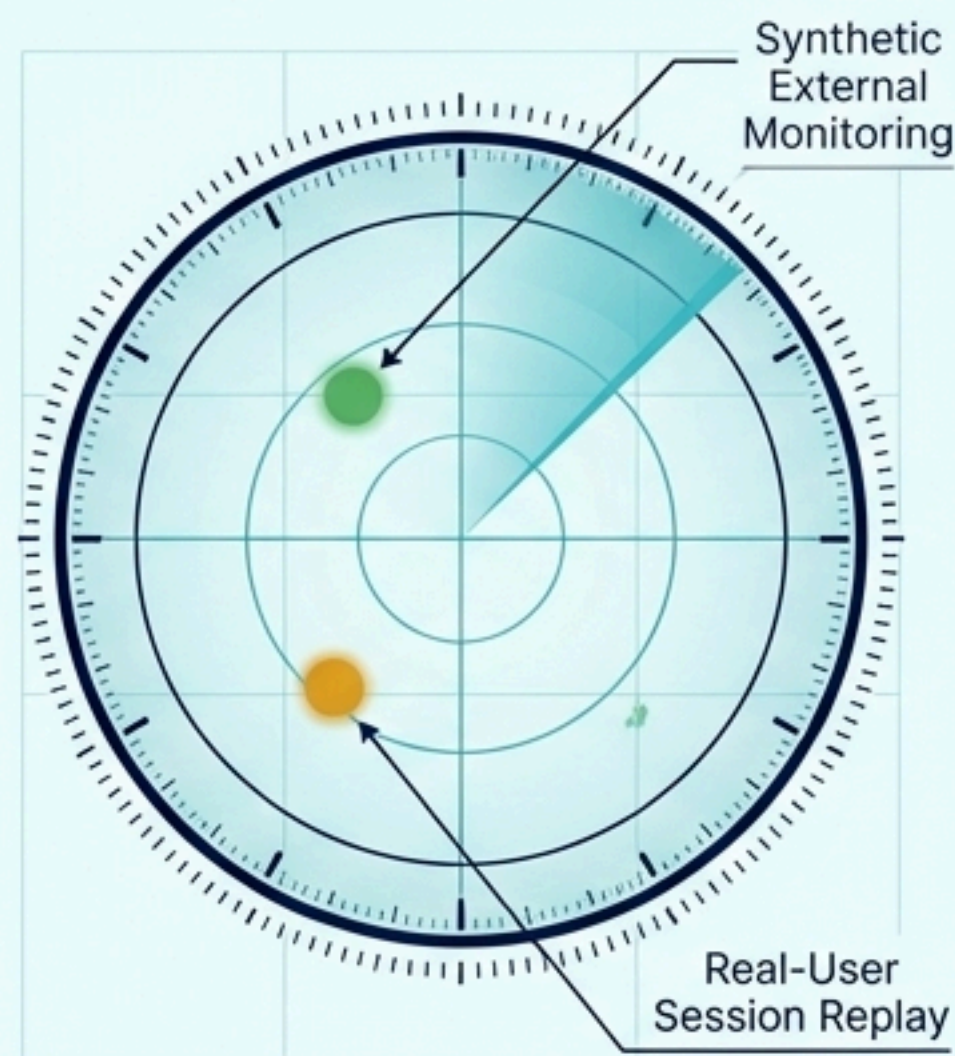


Flotilla Alpha detects threats before they strike the hull

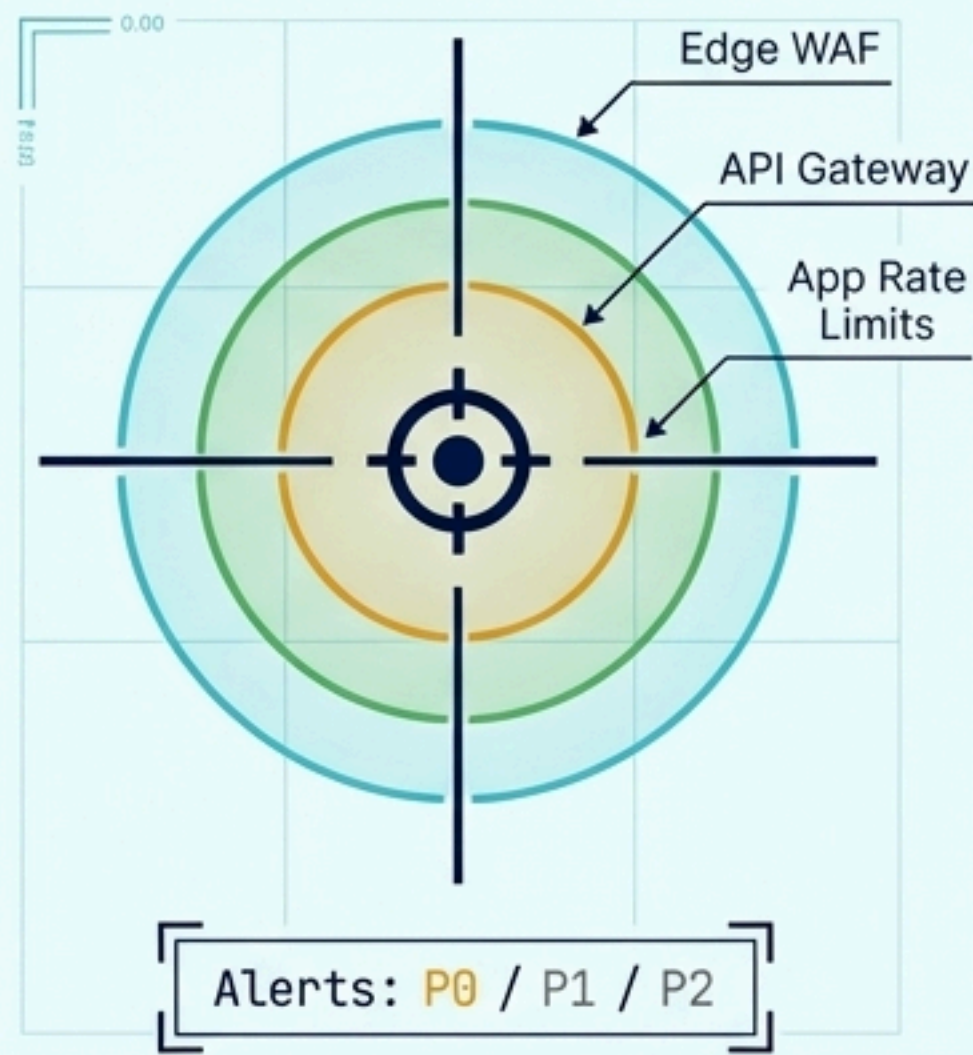
Destroyers: Infra & Logs



Submarines: Errors & Uptime



CIWS: Alerting & Defense

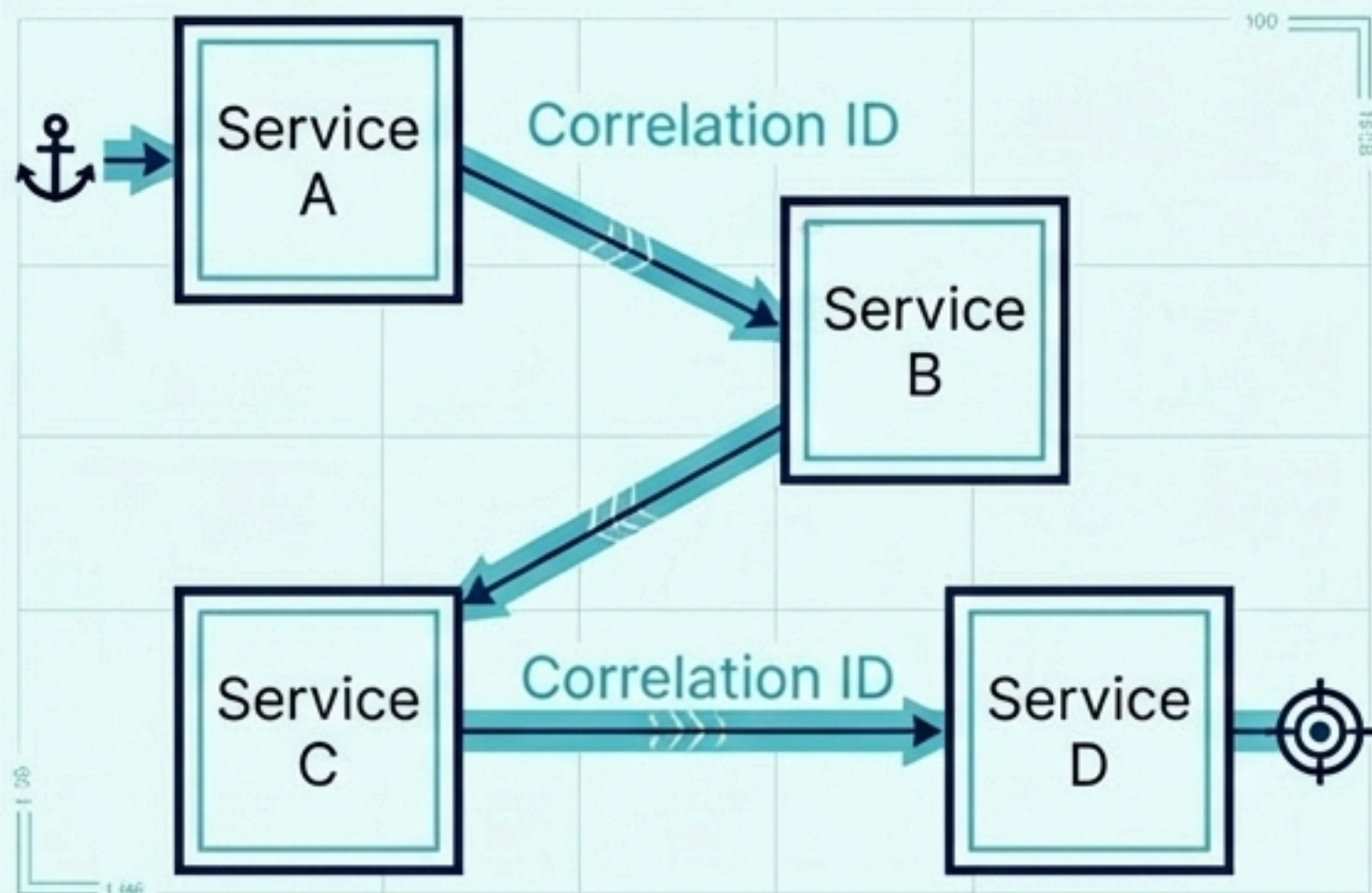


Tech Loadout: Starter Stack

Prometheus | Grafana Loki | Sentry | Better Stack | Pino | Cloudflare WAF

Surveillance blind spots leave the fleet vulnerable

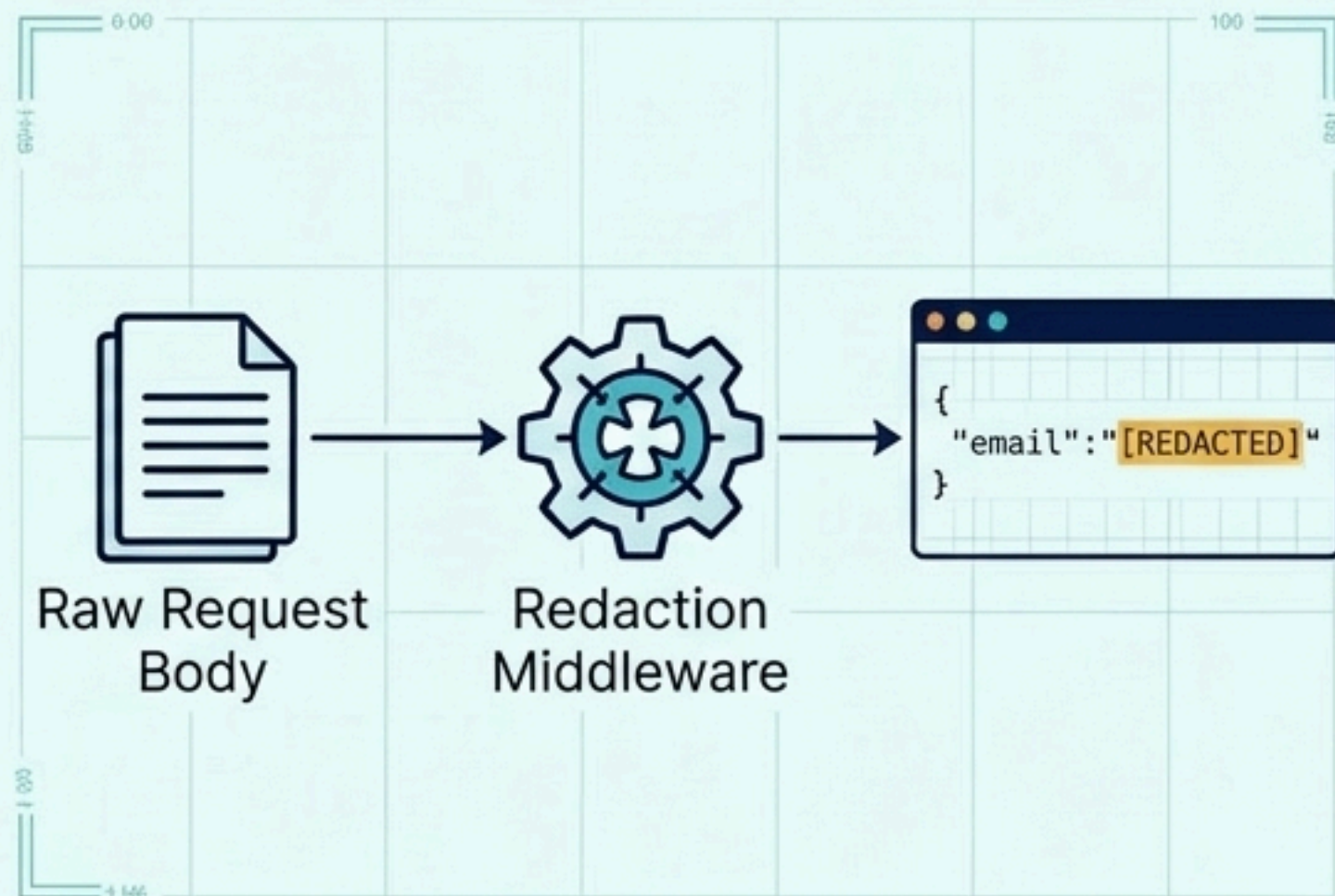
The Trace ID Thread



WARNING

Logs without correlation IDs are noise. Tracing is mandatory for distributed debugging.

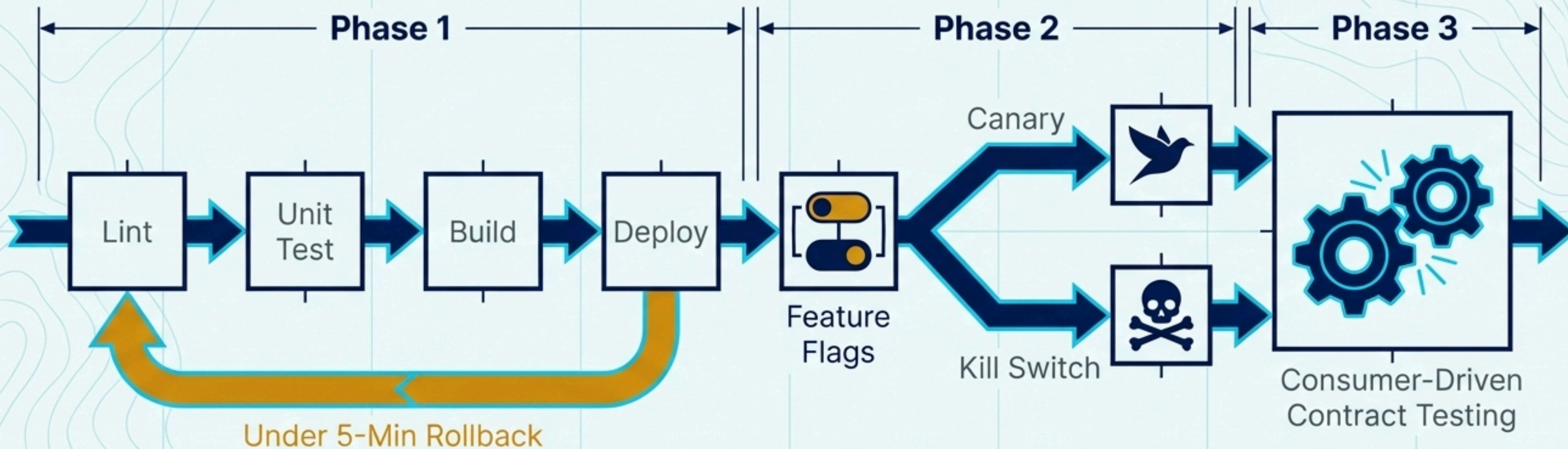
The PII Blackout



WARNING

Never log raw request bodies. Every data exit point needs an active PII filter to comply with OWASP.

Flotilla Bravo strikes with precision and iterates safely



Tech Loadout: The Arsenal

GitHub Actions

ArgoCD

Docker

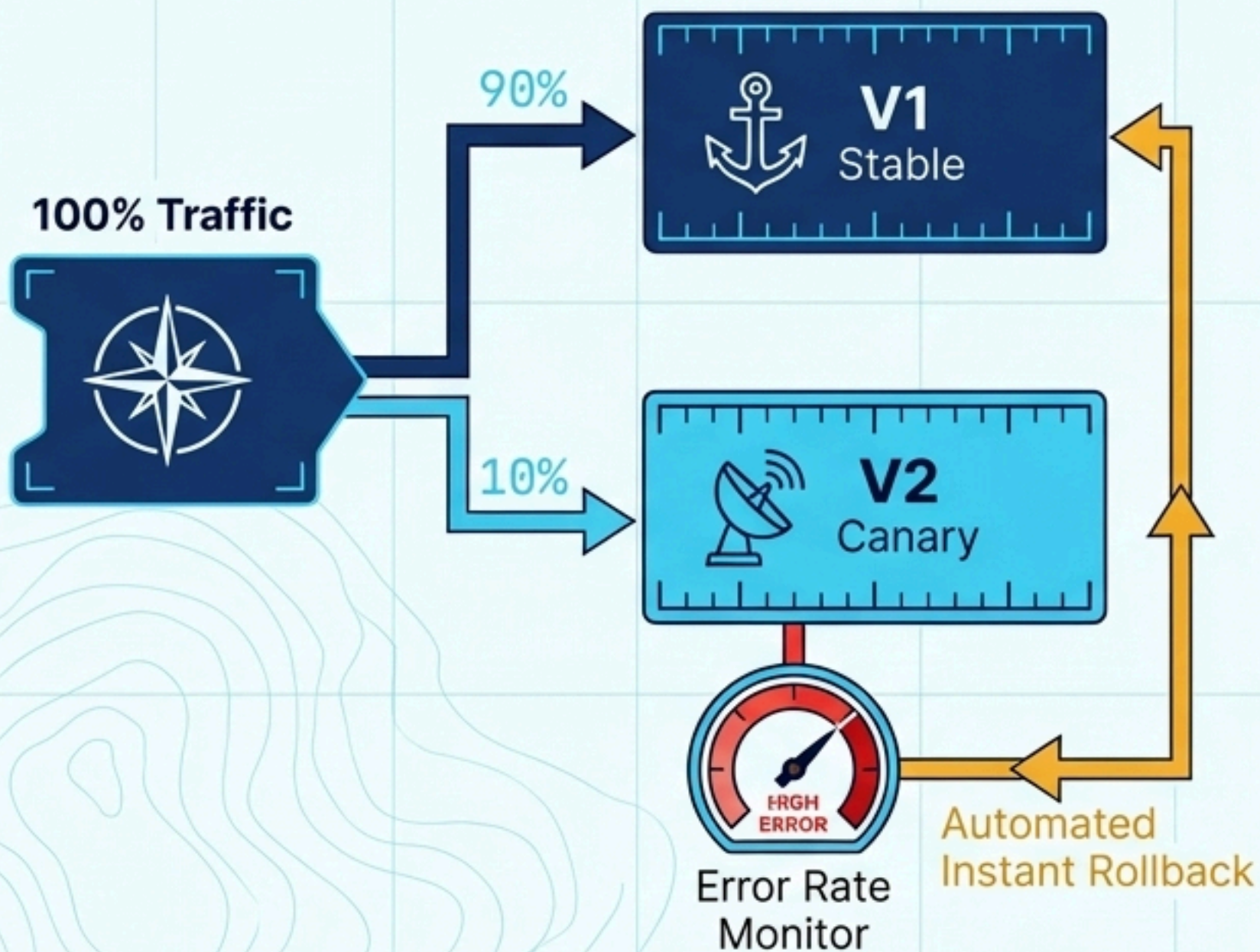
Unleash

Swagger

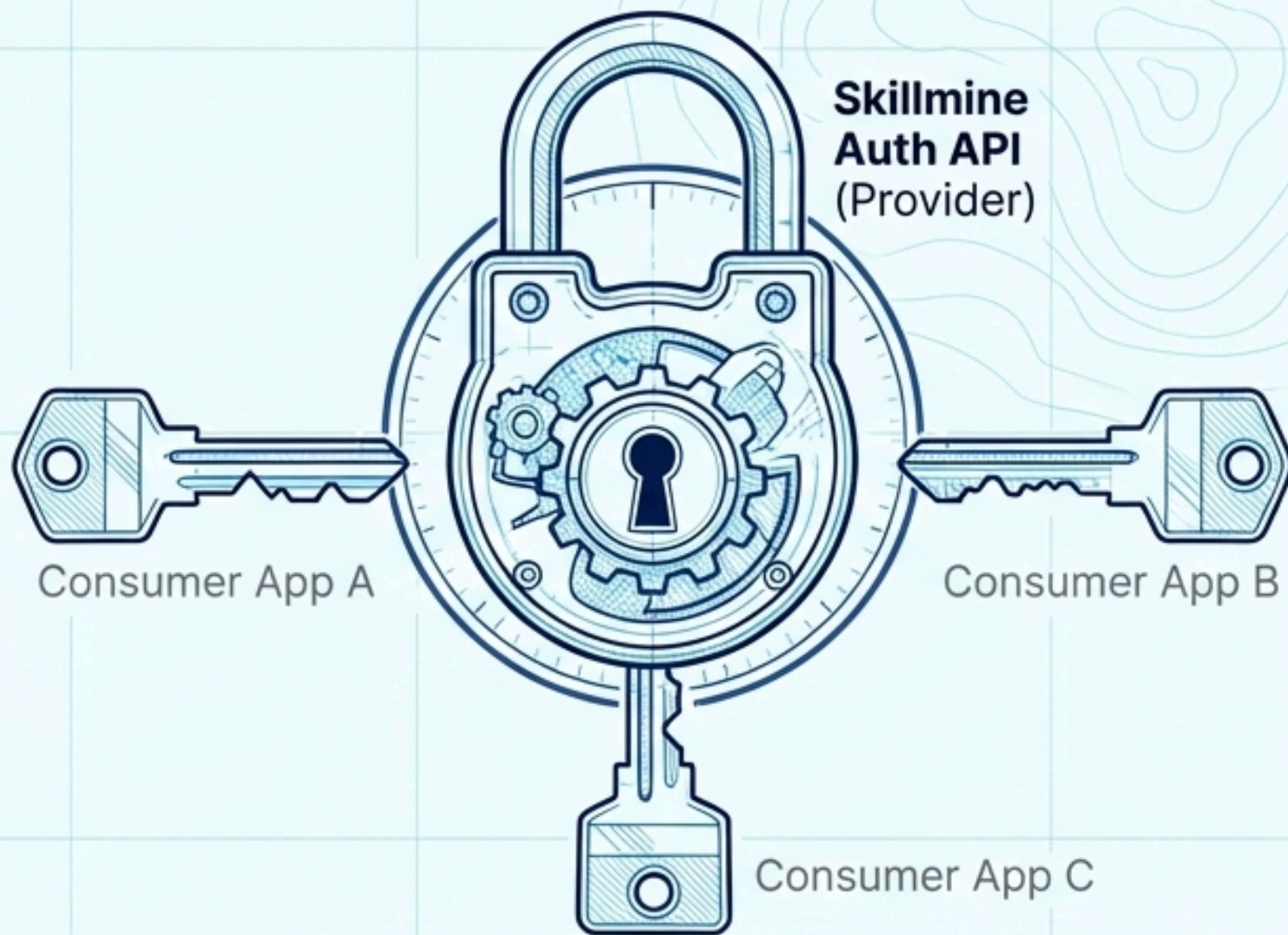
Pact

Evolve the system without breaking existing consumers

Feature Flags in Action

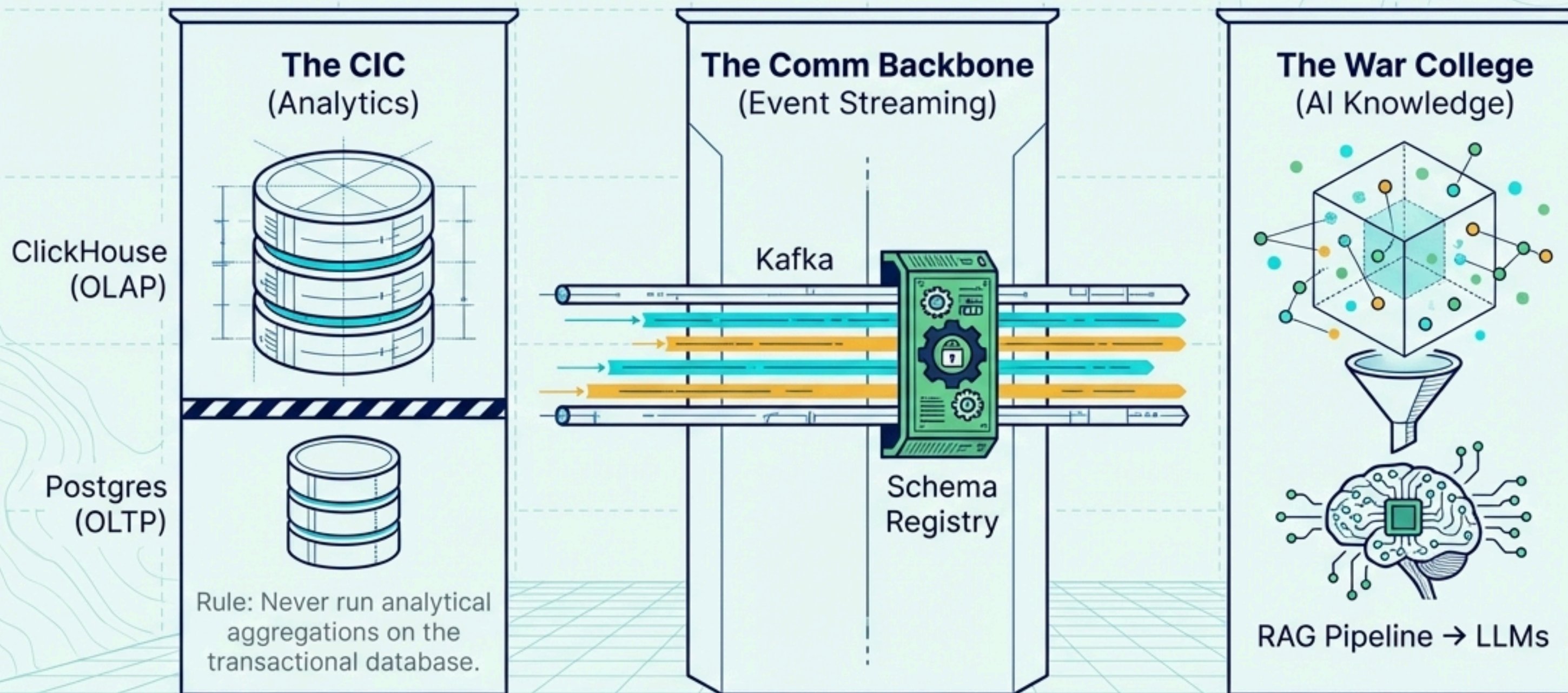


Contract Testing



URL versioning without contract testing is wishful thinking. A shared infrastructure service breaking causes a chain reaction across the entire fleet.

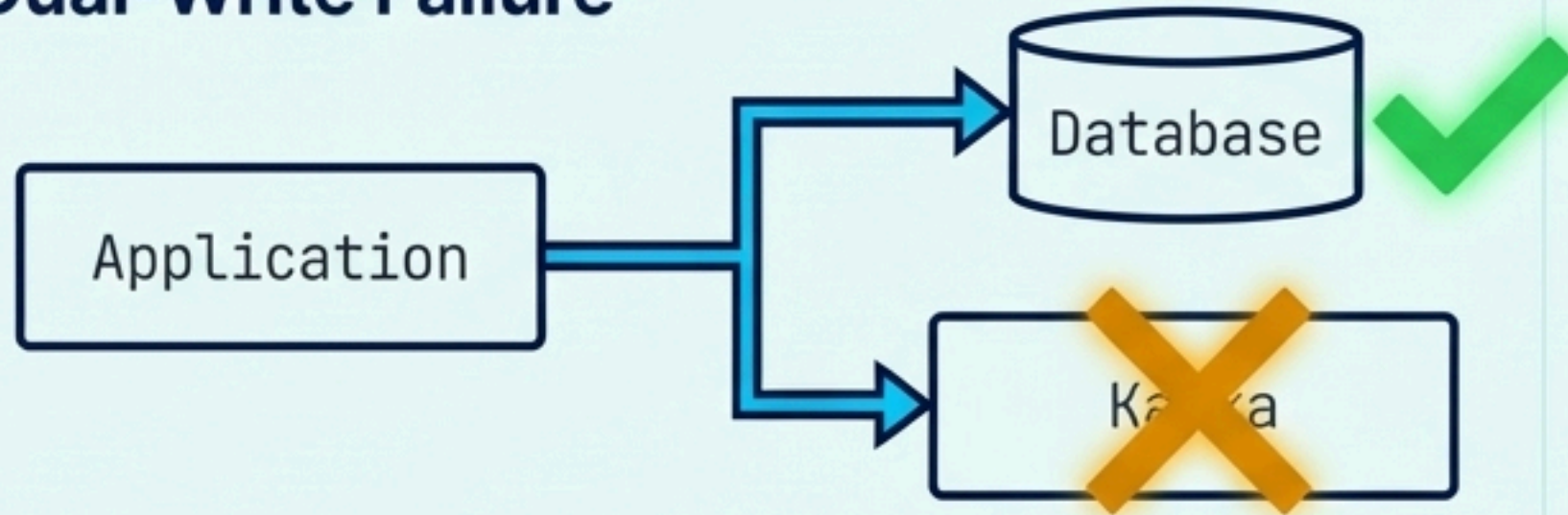
Flotilla Charlie processes massive data into tactical intelligence



Tech Loadout
ClickHouse | Kafka | BullMQ | pgvector | LangChain | OpenAI

The Outbox Pattern prevents distributed data corruption

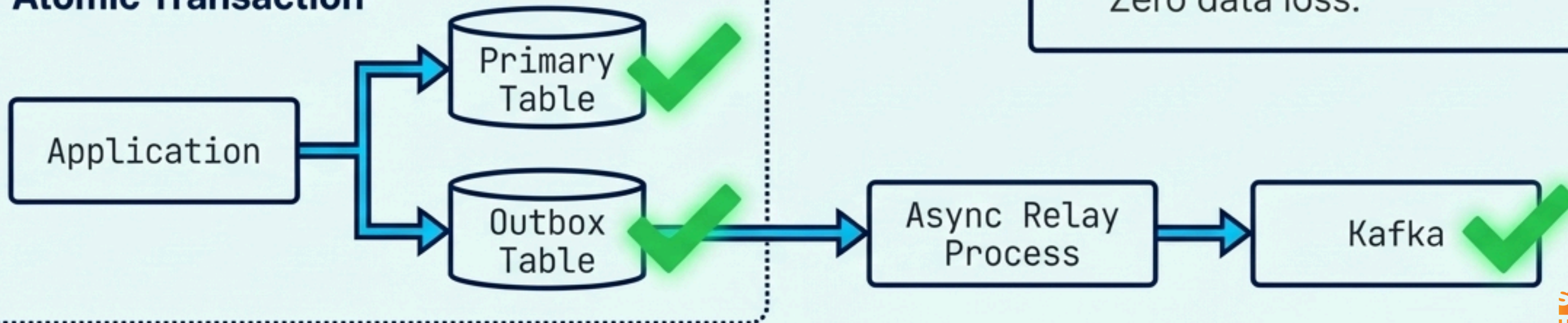
Dual-Write Failure



Result: Corrupted state. The database thinks the event happened; the rest of the system does not.

Outbox Success

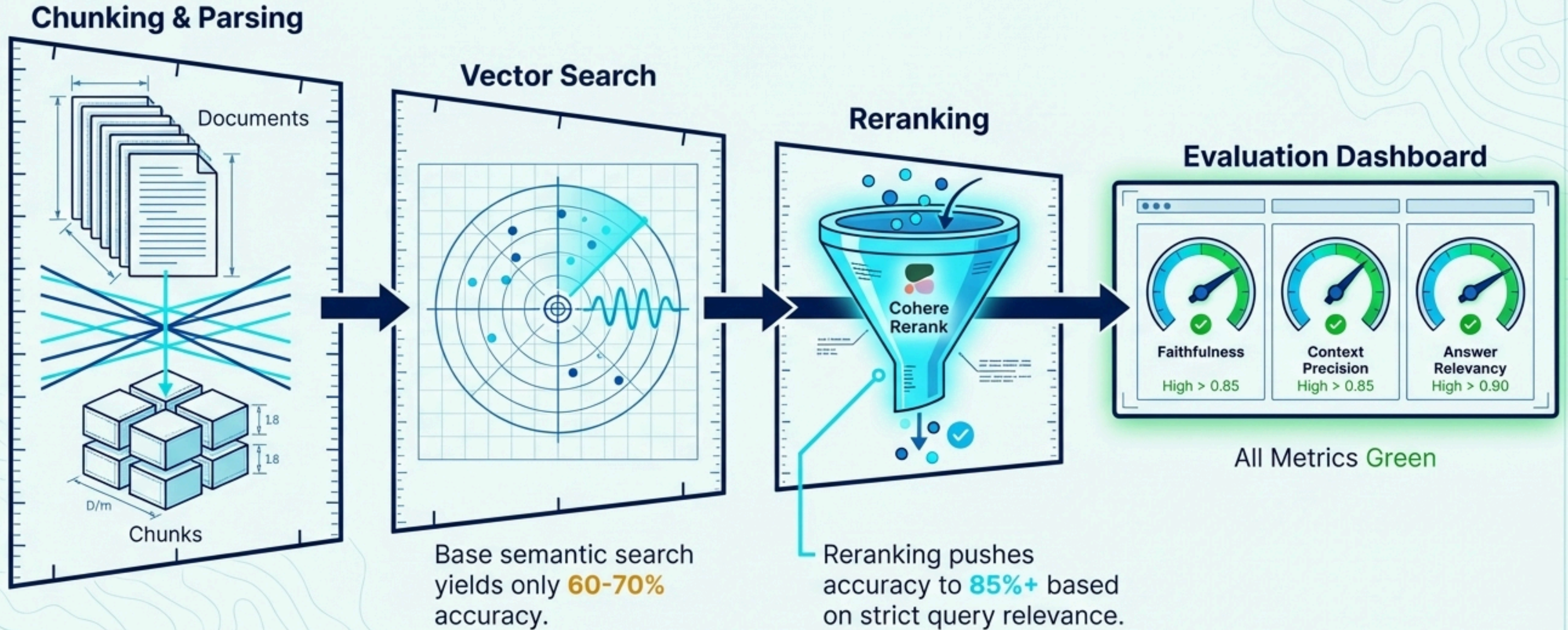
Atomic Transaction



Result: Absolute consistency.

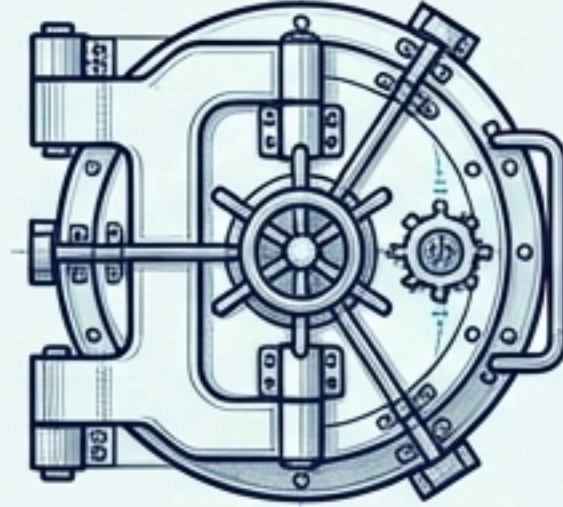
Zero data loss.

Battle-ready RAG architectures mandate reranking and evaluation



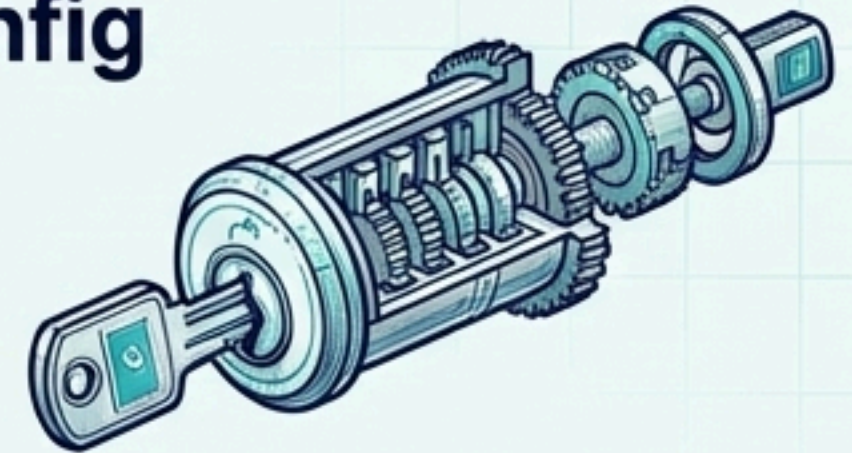
Flotilla Delta sustains, protects, and recovers the fleet

Backups & DR



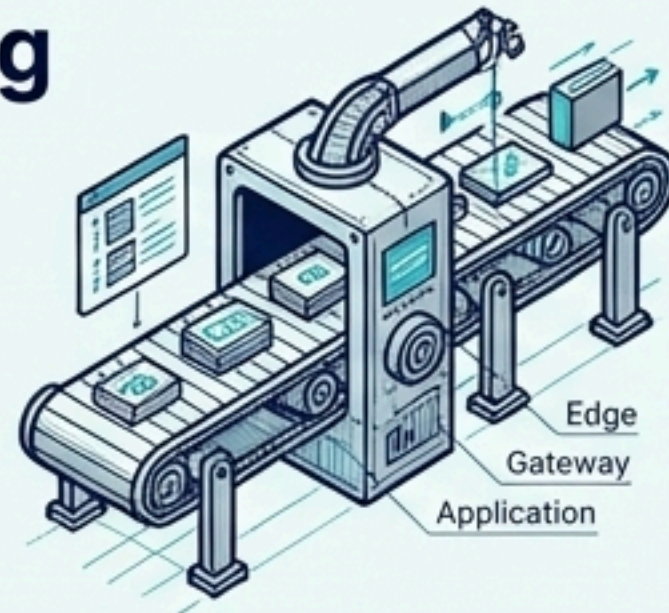
A backup never restored is just an assumption. Automated restore testing is mandatory.

Secrets & Config



Eliminate static tokens. Use dynamic, short-lived credentials via JetBrains Mono: Vault.

Caching & Pooling



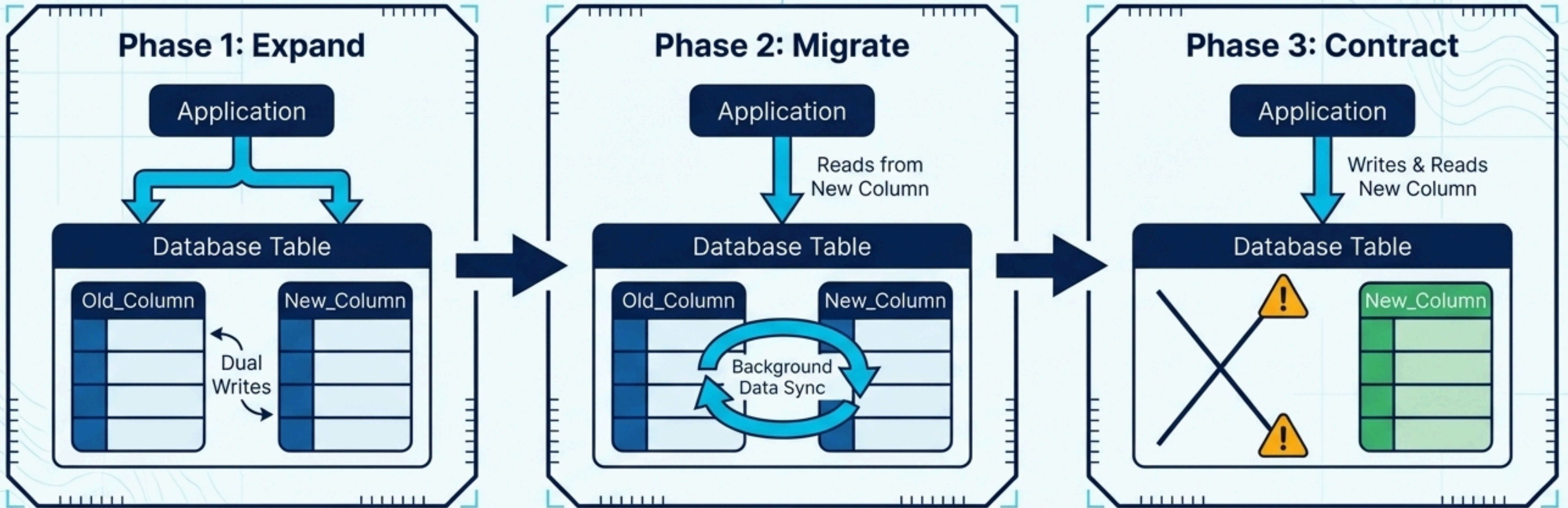
Caching is a multi-layered spectrum (Edge, Gateway, Application).

Security & Scanning



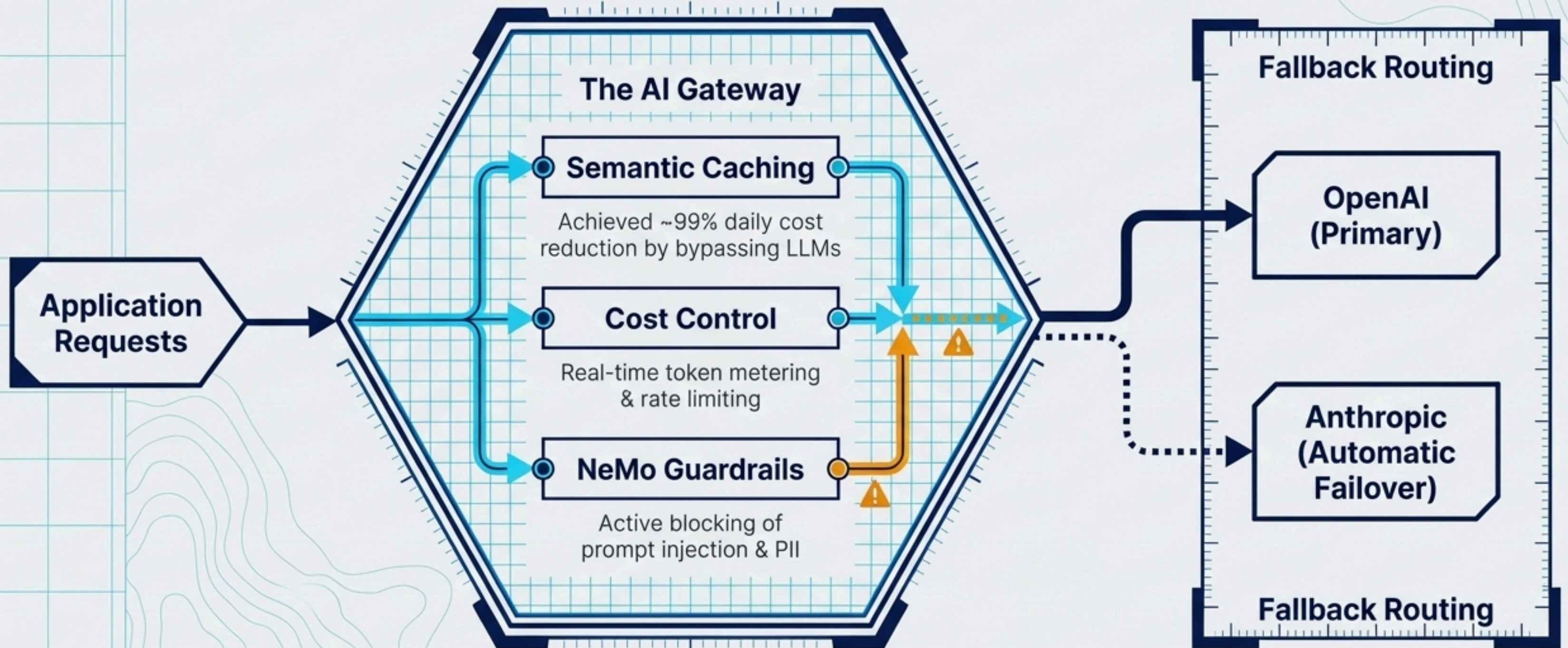
Shift-left CI scanning. Inspect dependencies for supply chain attacks.

Refit the ship while at sea using Expand-Contract migrations



Manual DDLs in production are forbidden. The **migration tool** is only **10%** of the problem; the **zero-downtime strategy** is the other 90%.

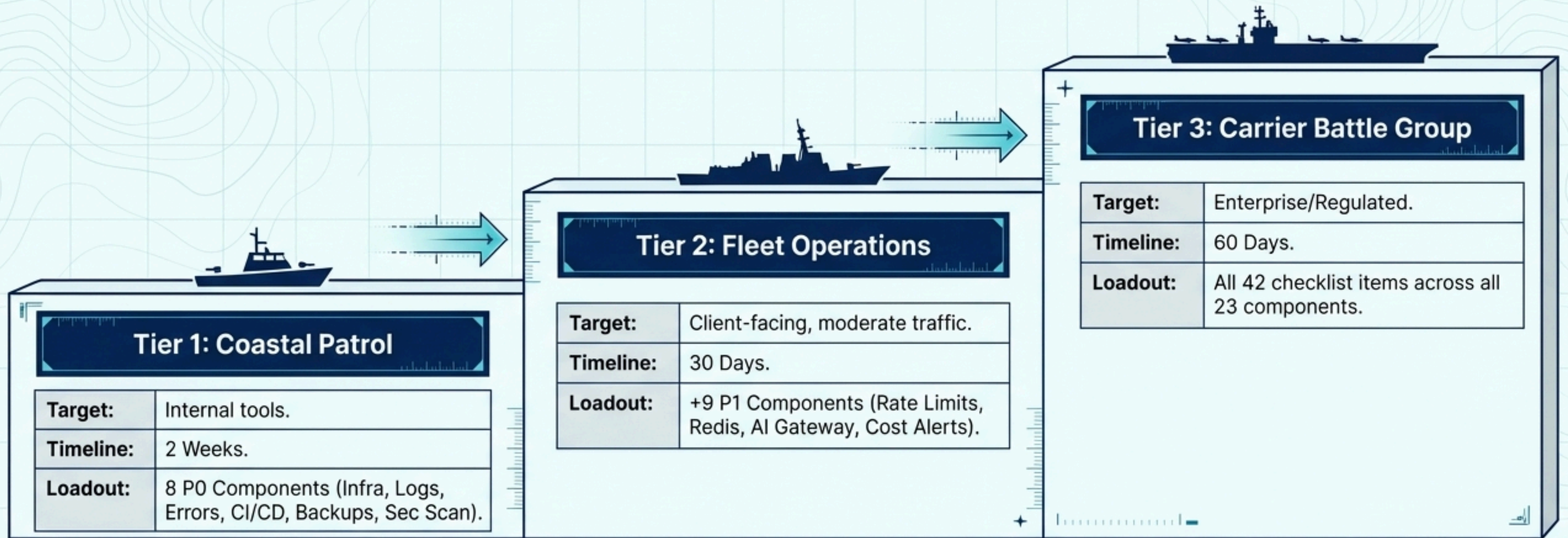
The AI Gateway prevents runaway LLM costs and enforces guardrails



The Blind Spots Diagnostic: Delusion vs. Reality

Component	Standard Delusion	Battle-Ready Reality
Observability	CPU/RAM Dashboards & Console.log()	5-Layer APM, Cost Tracking, & Structured JSON with Trace IDs
Event Streaming	Direct publish to Kafka JetBrains Mono	The Outbox Pattern & Schema Registries JetBrains Mono
AI / LLMs	Basic Vector Search & unmetered LLM calls JetBrains Mono	Reranking, Ragas Evaluation, & AI Gateway Semantic Caching JetBrains Mono
Databases	Node.js connecting directly to Postgres JetBrains Mono	PgBouncer connection pooling to prevent connection exhaustion JetBrains Mono

Scale the defense to match the target's threat profile



**The goal is not day-one perfection. The goal is continuous progression.
Ship the battle group.**