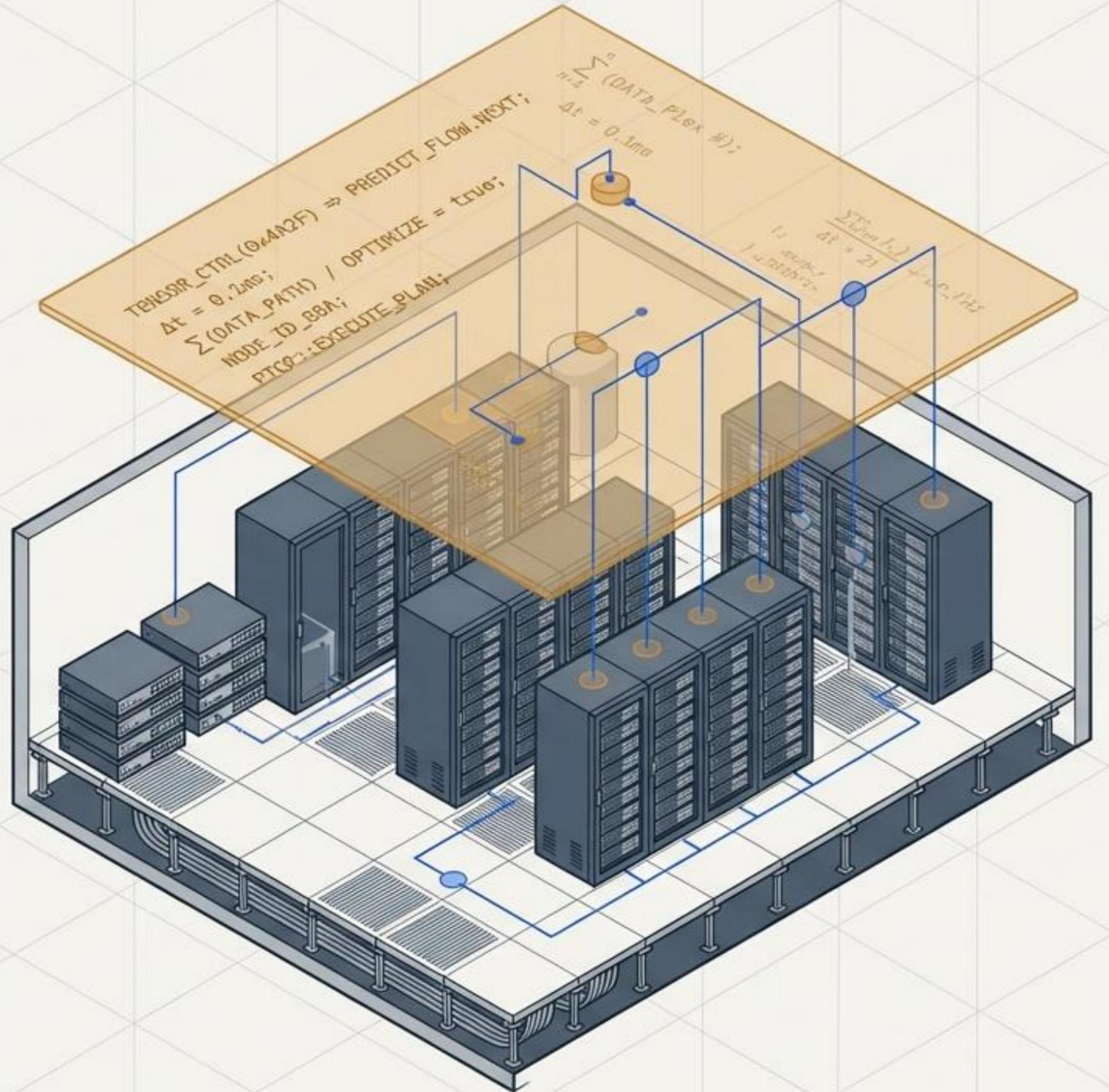
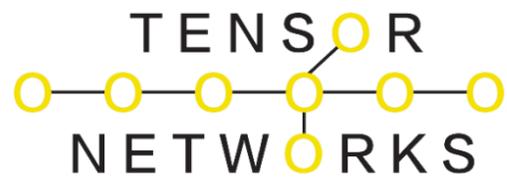


Securing and Optimizing the Public Sector Data Path

How the Predictive Tensor Control Plane (PTCP) transforms Federal, SLED, and Utility infrastructure from reactive to predictive.

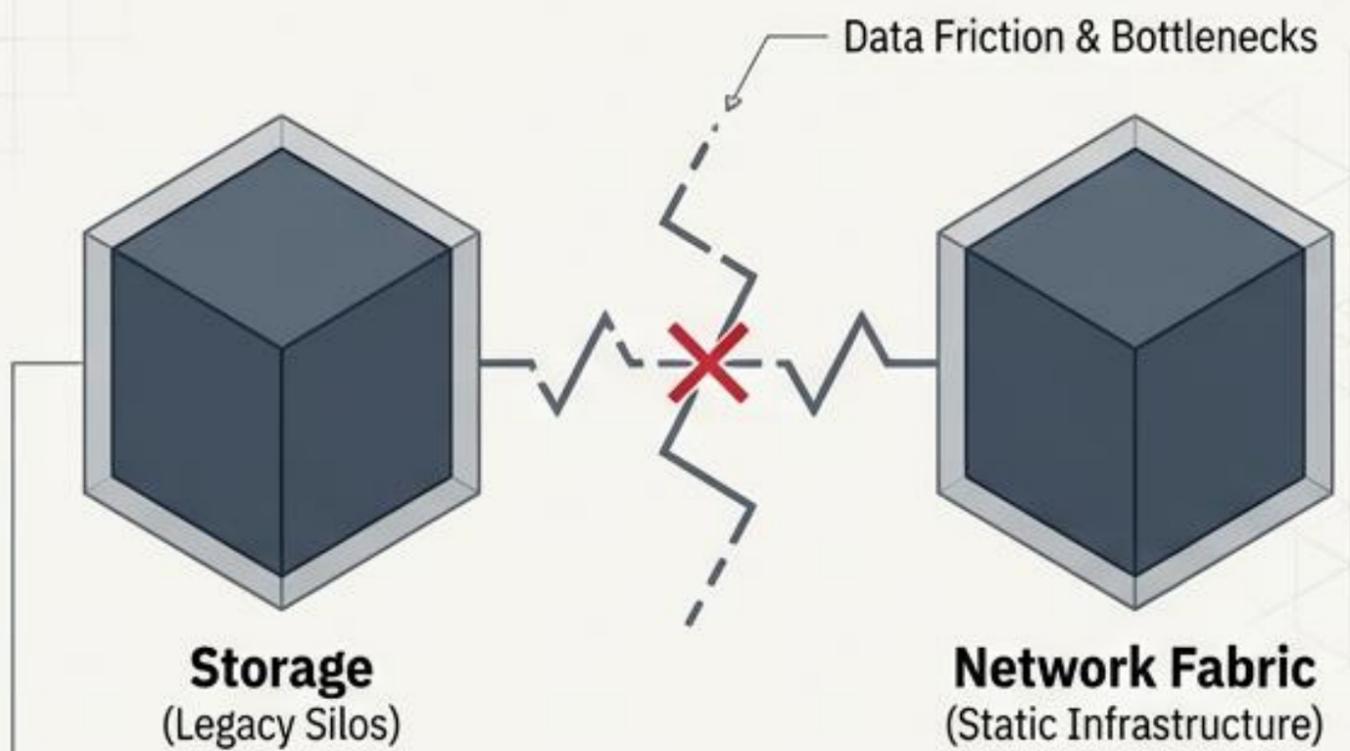




Disclaimer: Forward-Looking Statements This presentation may contain forward-looking statements regarding future product plans, expected features, or anticipated release dates. These statements outline our general product direction and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for our products remain at our sole discretion and are subject to change without notice. These statements do not represent a commitment, promise, or legal obligation to deliver any specific material, code, or functionality

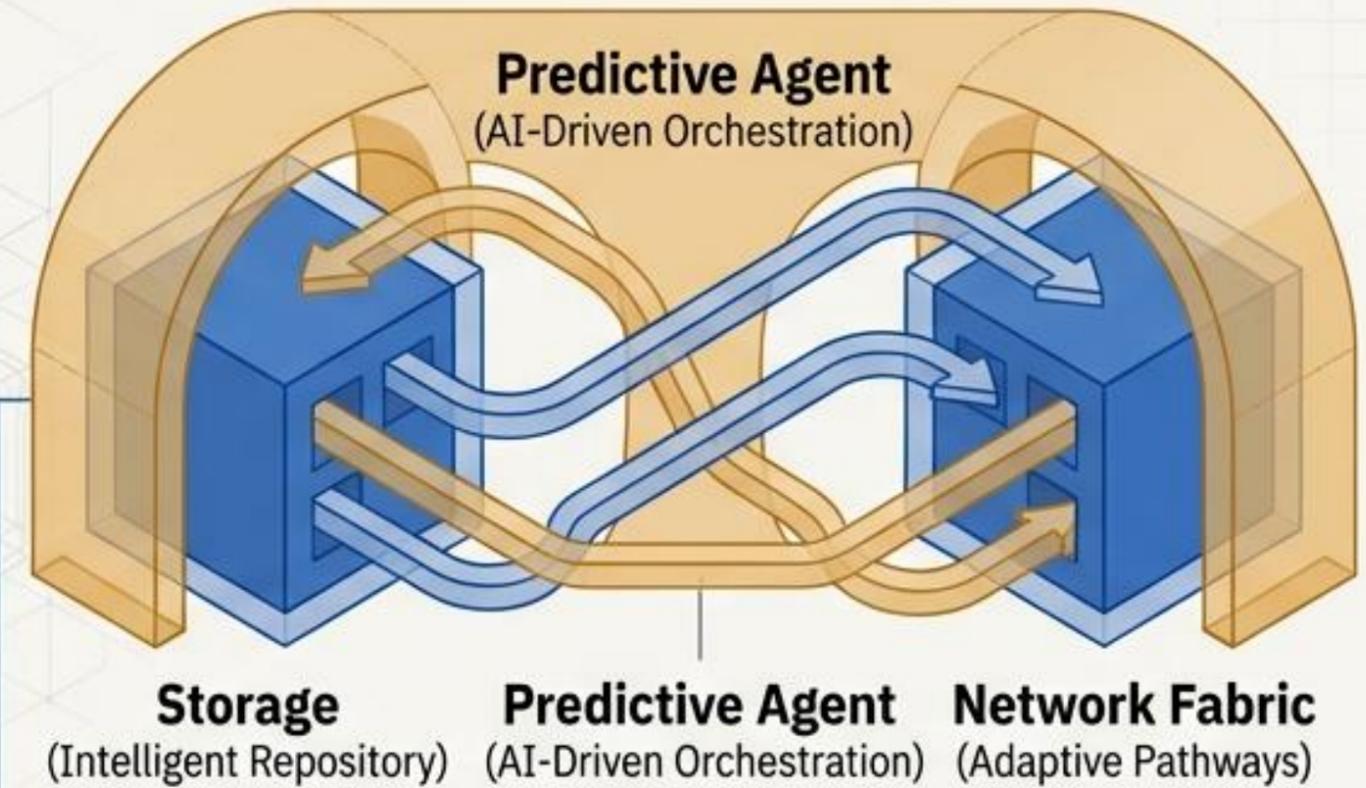
The Public Sector Bottleneck: Reactive Data Movement

Current State: Reactive Hardware



- **Trigger:** Reacts only after demand or surges appear.
- **Architecture:** Ensembles of decoupled, blind data movers.
- **Outcome:** Storage stalls, silent congestion, uncoordinated I/O floods.

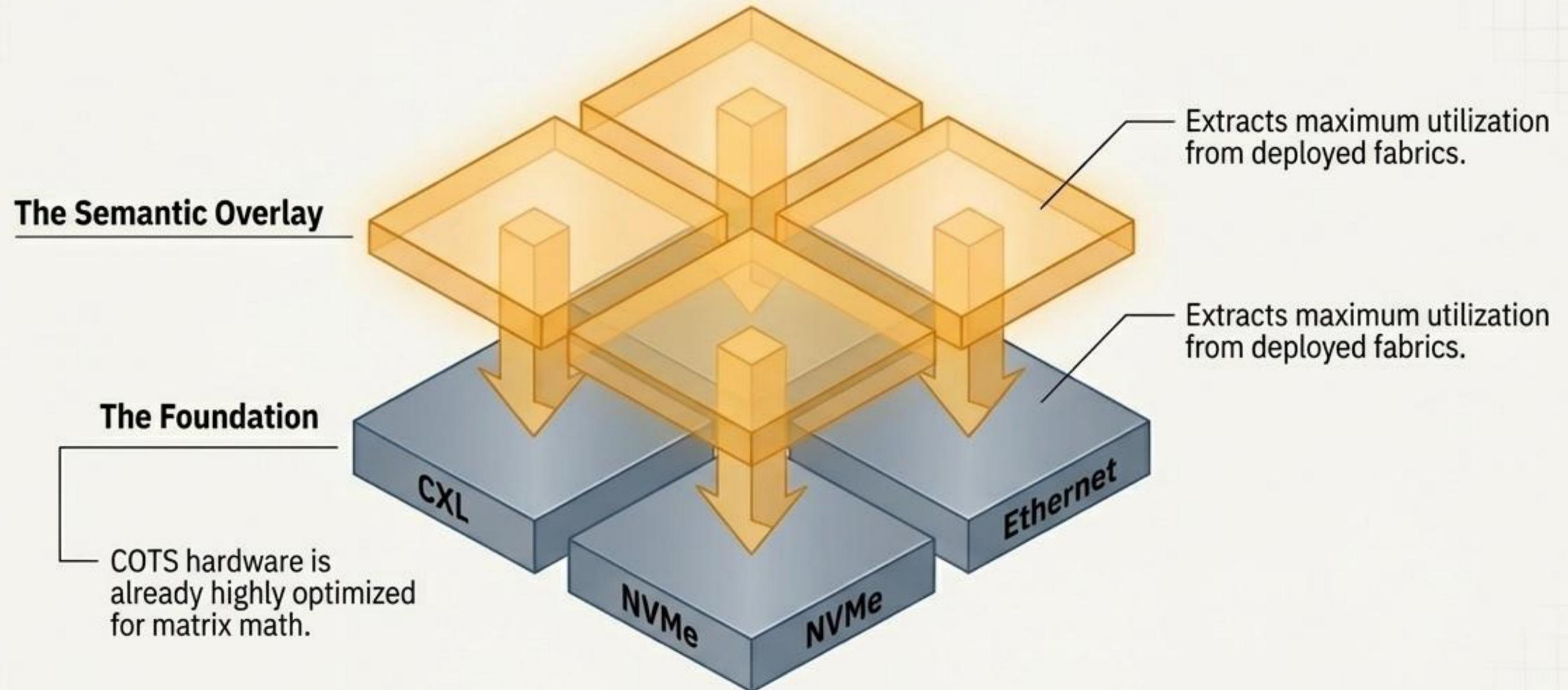
Future State: Predictive Tensor Control Plane (PTCP)



- **Trigger:** Forecasts demand and pre-positions data.
- **Architecture:** Unified PoL-KDE behavioral modeling.

$$P(d|h, c) = \sum_i w_i \cdot K\left(\frac{d-d_i}{\sigma}\right)$$
- **Outcome:** Coordinated traffic pacing, probabilistic tiering, maximum system yield.

Smarter Orchestration, Not New Silicon



Deploying a predictive framework does not require entirely new silicon. It requires a **smarter semantic layer** orchestrating the silicon you already own.

The Mathematical Engine: Tensor Train Decomposition

The Problem

Tracking the joint state of infrastructure variables creates a dense discretized state mathematically too large to hold.

The Execution

Standard hardware evaluates only marginals, conditionals, and anomaly scores directly near the data path without materializing the massive dense tensor.

$$P[i_1, \dots, i_d] \approx \sum G^{(1)}[1, 1, a_1] G^{(2)}[a_1, i_2, a_2] \dots G^{(d)}[a_{(d-1)}, i_d, 1]$$

The Compression

Tensor Train mathematically compresses this massive state.

This mathematical compression ensures the predictive model fits seamlessly onto standard hardware memory.

One Unified Architecture. Three Distinct Mandates.



Federal & Defense

Anomaly-resistant intelligence, confidentiality, and quarantining cyberattacks.



SLED (State, Local, Education)

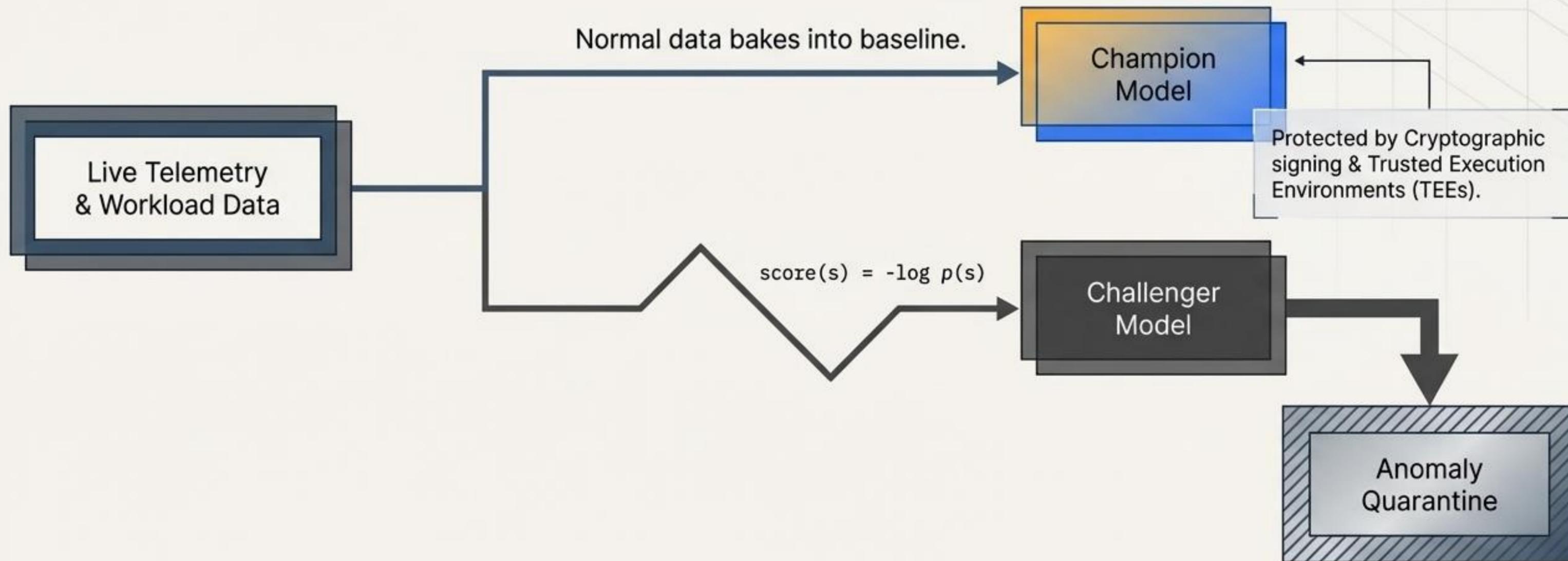
Safe multi-tenancy, extracting maximum COTS value, stretching taxpayer budgets.



Utilities

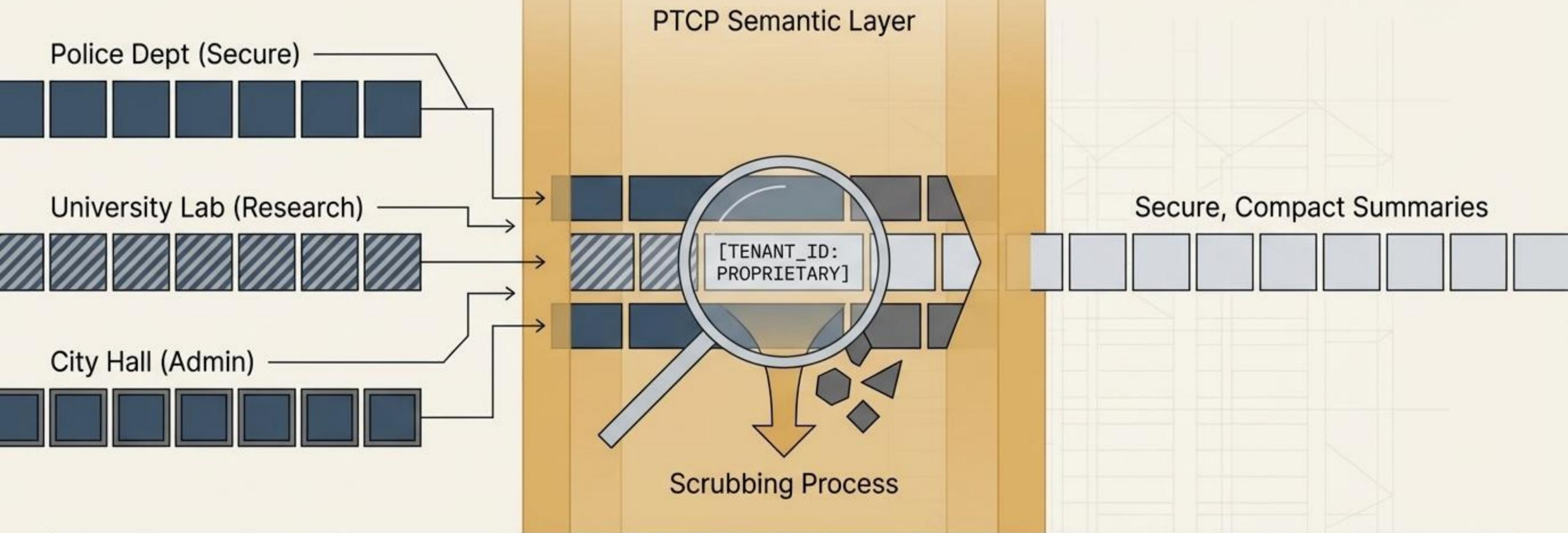
Resilient critical infrastructure, traffic pacing for grid surges, eliminating network/storage blind spots.

The Federal Advantage: Secure, Anomaly-Resistant Intelligence



Behavioral models track detailed access patterns. PTCP mathematically compartmentalizes profiles by tagging telemetry with specific tenant IDs, ensuring provenance and protecting intelligence gathering from silent congestion or pathological queue growth.

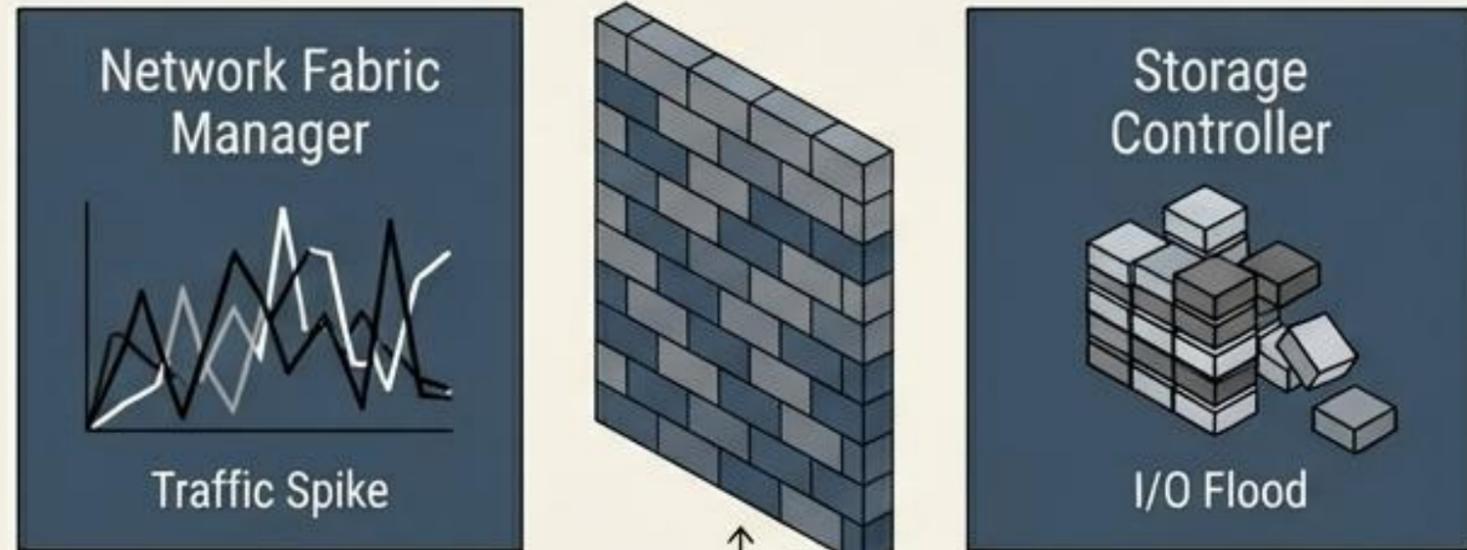
The SLED Advantage: Safe Multi-Tenancy on Shared COTS



SLED infrastructures inherently host varied workloads. PTCP utilizes tenancy tags to scrub identifying proprietary signatures before data ever leaves the local node, allowing completely safe resource sharing across municipal and educational departments.

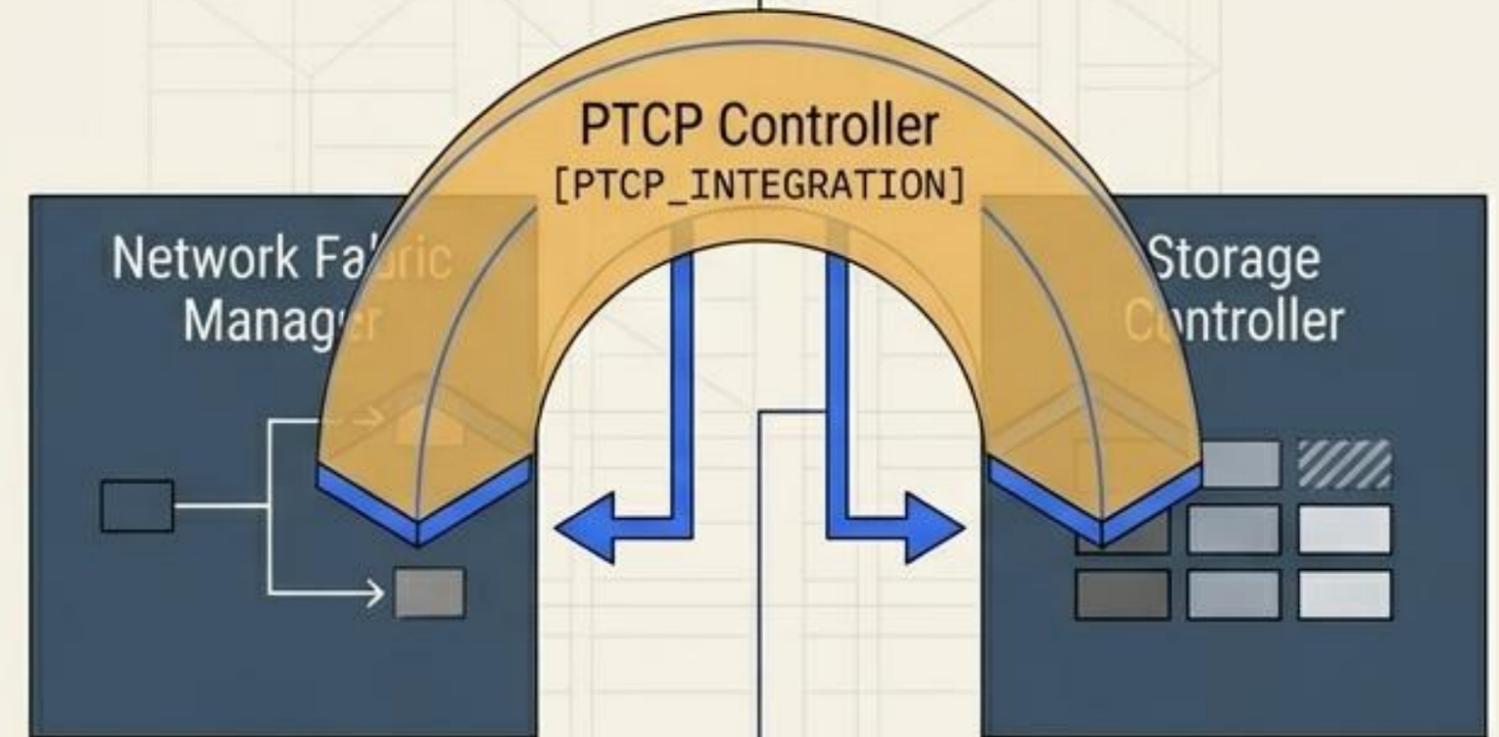
The Utility Advantage: Unified Resilience During Grid Surges

Traditional: The Blind Spot



Independent Operation: Reacting Independently and Failing

PTCP: The Unified Conductor

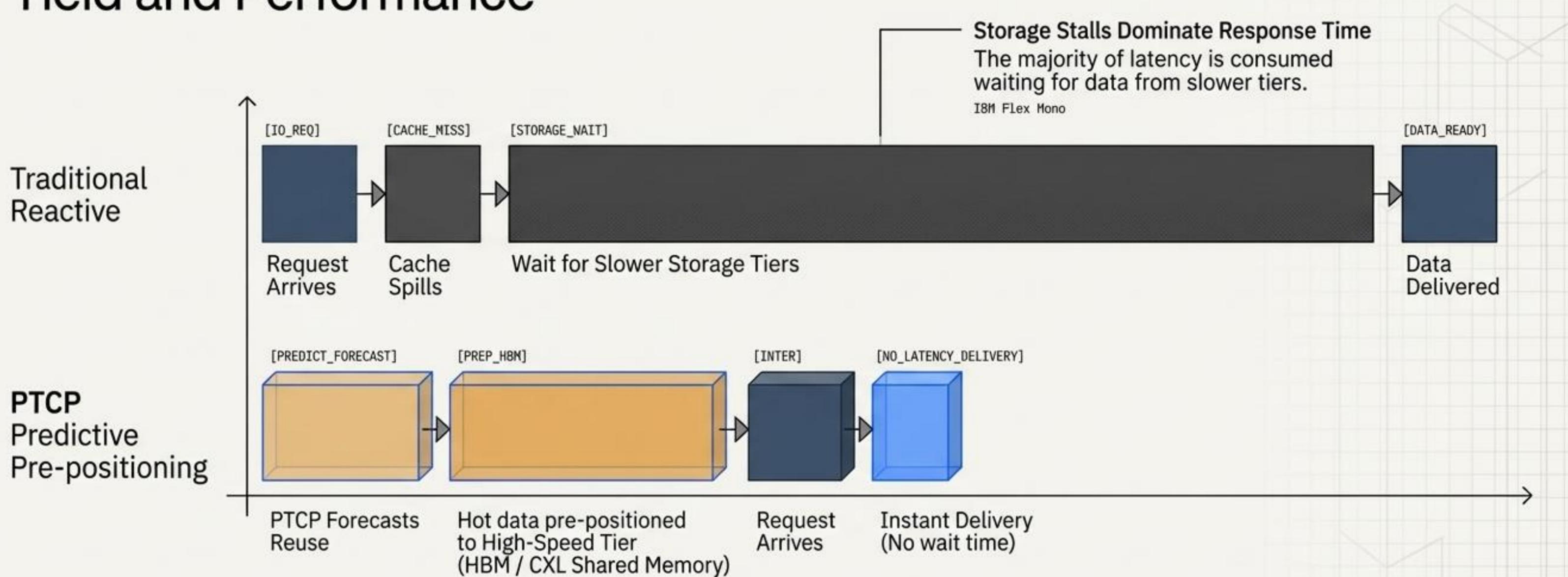


Action 1: Emits bounded hints to pre-emptively pace traffic before pressure forms.

Action 2: Executes Probabilistic Workload Tiering: dynamically flushes to durable storage or keeps hot in memory.

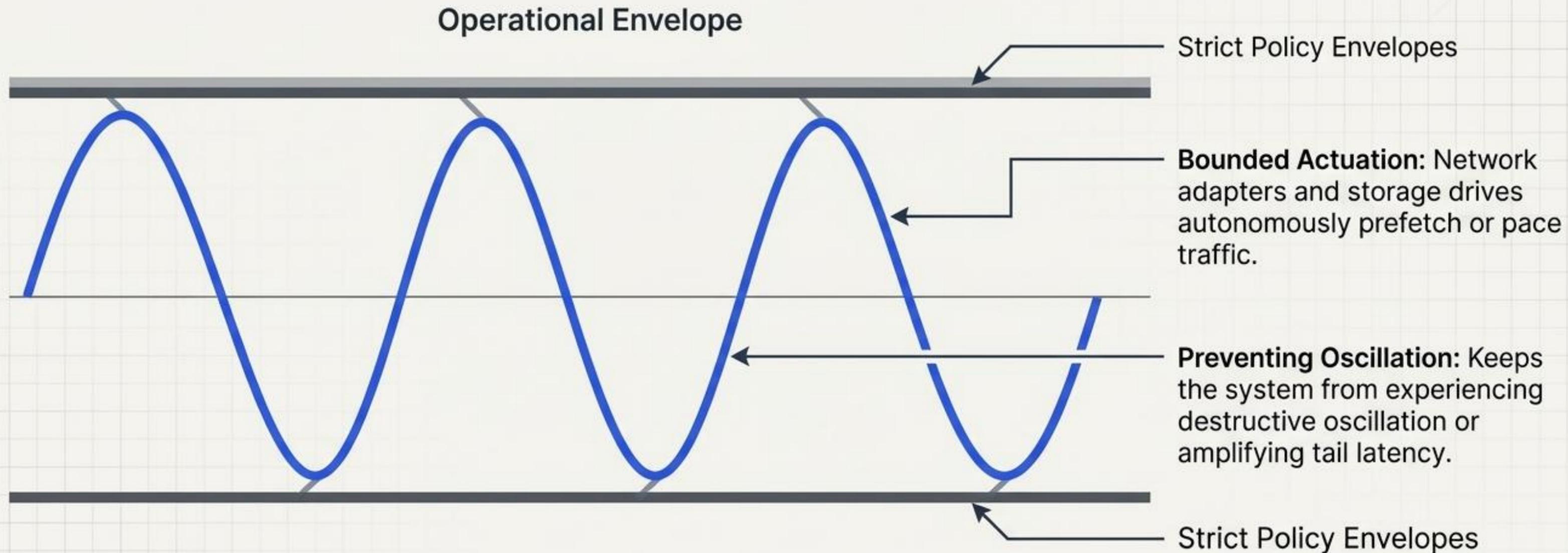
Eliminates the blind spot by coordinating both network and storage simultaneously during critical weather or grid events.

ROI Pillar 1: Maximizing System Yield and Performance



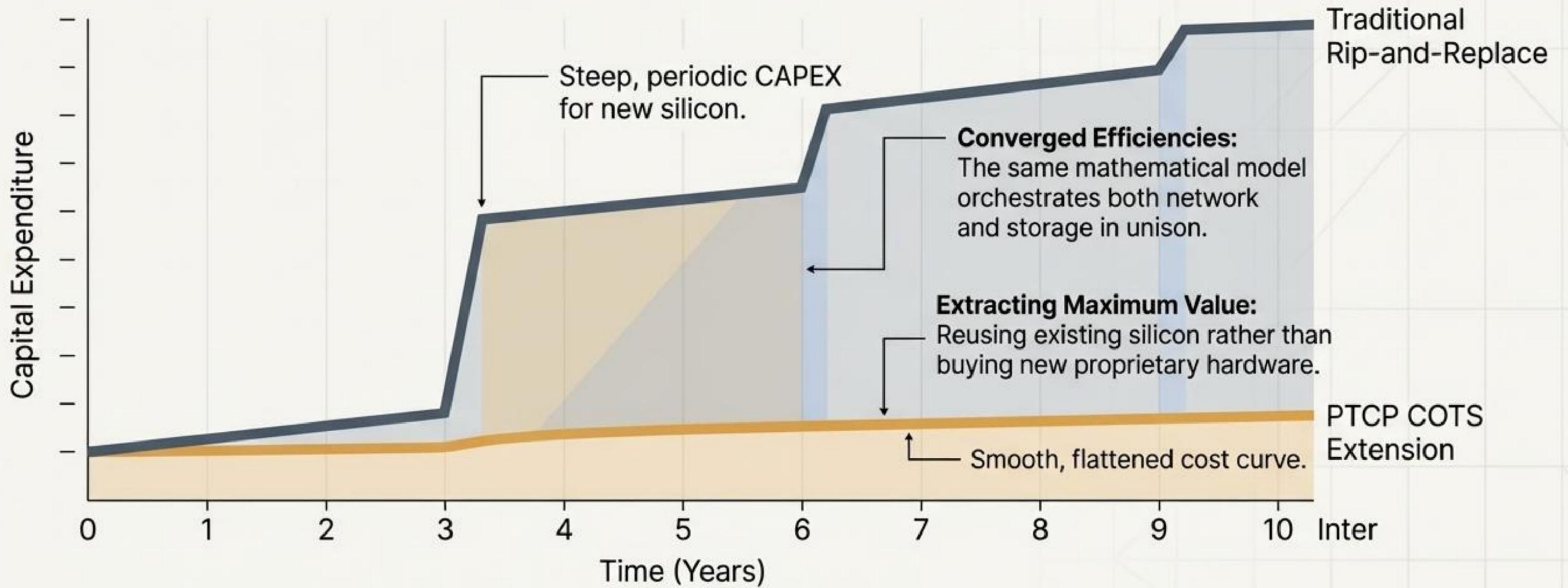
Audience Impact: SLED and Federal agencies guarantee near-instantaneous AI application response for analysts. Utility grid telemetry is processed in real-time without fatal latency spikes.

ROI Pillar 2: Safe Autonomy via Bounded Control



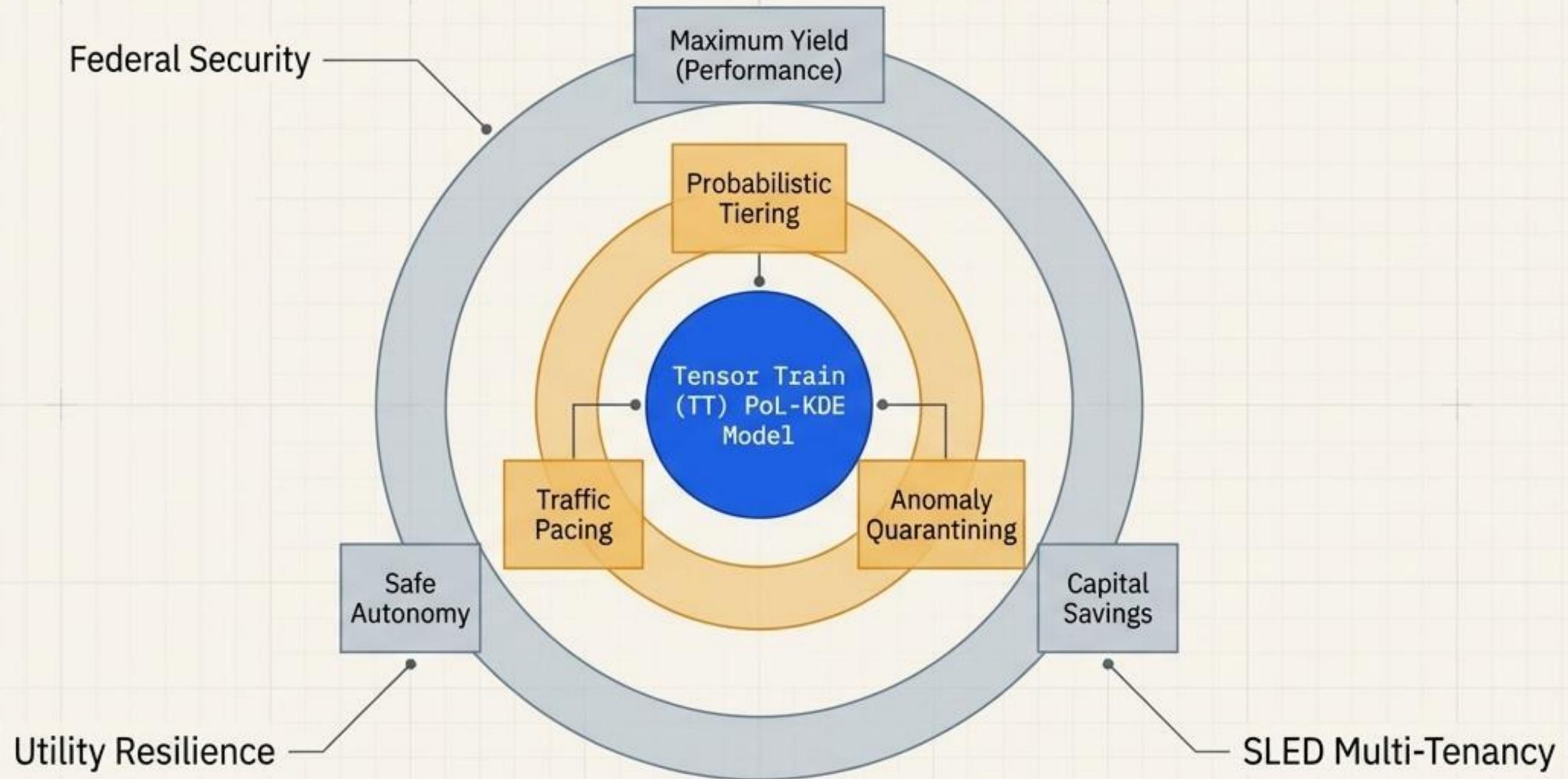
The infrastructure becomes self-healing. Non-critical network traffic is autonomously paced to prioritize critical optimizer-state transfers, ensuring uninterrupted service without 3:00 AM manual IT intervention.

ROI Pillar 3: Capital Savings and Extended Lifecycles

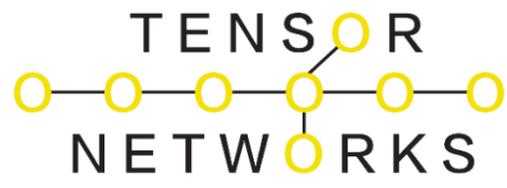


Maximizing the capacity of deployed COTS hardware saves millions in CAPEX. This directly prevents utility rate hikes and preserves taxpayer funds for actual public services rather than redundant IT infrastructure.

The Unified Fabric: Validating Predictive Infrastructure



By predicting data demand rather than reacting to it, validated PoL-KDE systems ensure expensive compute cycles process critical public sector tasks—not wait for data.



Thank You for Your Partnership We look forward to building the future of networking together. Please don't hesitate to reach out with any questions.

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