AxiomDeta: Computational Infrastructure for Tropical & Extreme Environments

Bridging Precision Manufacturing & Tropical Resilience Standards

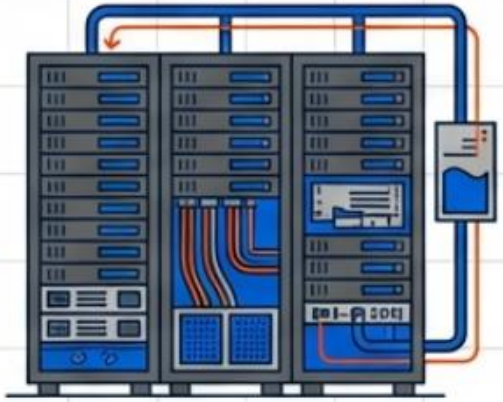
- **Strategic Mandate:** Solving the 'Tropical Penalty'—infrastructure engineered for high heat (>35°C), 90%+ humidity, and salinity.
- **The AxiomDeta Fusion:** Combining Shenzhen's mature manufacturing capacity with Singapore's rigorous SS 564 Green Data Center standards.
- **Product Spectrum:** From silent office-edge workstations to full-scale liquid-cooled data center racks.
- **Target Partners:** Urban Infrastructure Operators , Government-Linked Enterprises, and High-Stakes Event Organizers.

Singapore Hub: DCDeepTech
(R&D, Software & Green Compliance)

Shenzhen Hub: Huadian Chenguang
(Precision Hardware & Supply Chain)

Joint Venture Synergy:
Engineering for the Equator

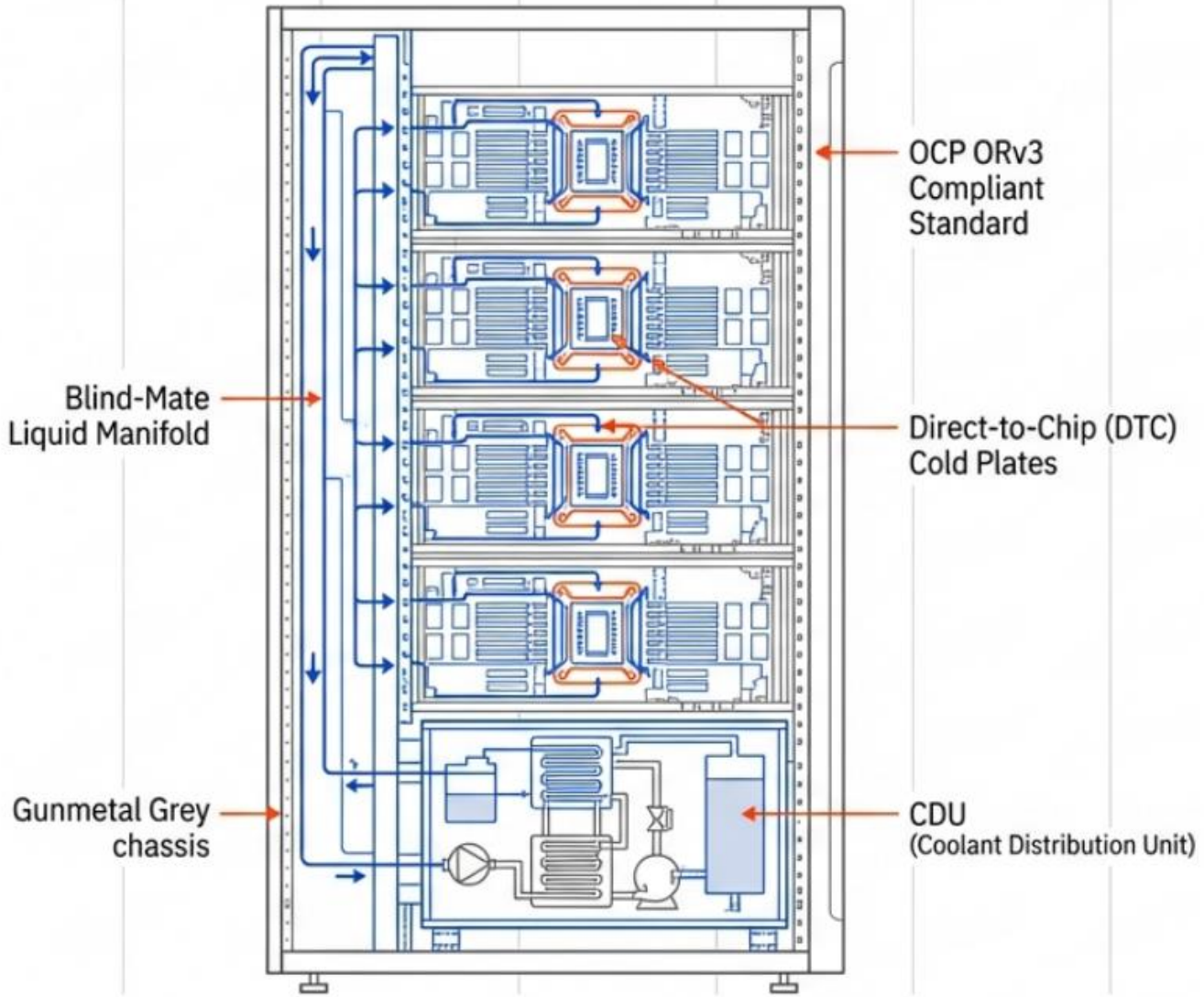
Orion
(Edge Workstation)



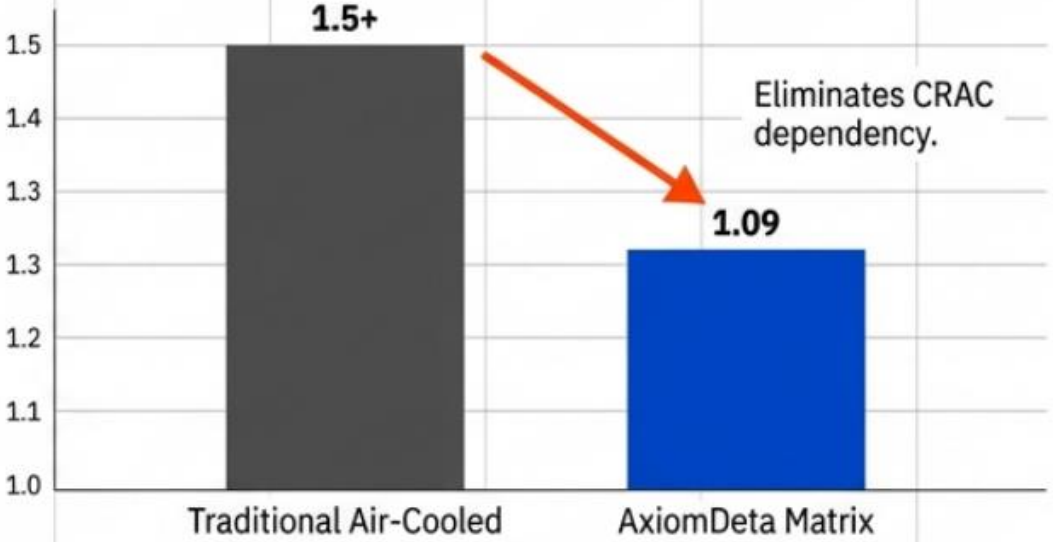
Matrix
(Core OCP Rack)

Cooperation Direction I: OCP-Compliant Green Data Center Infrastructure

The “Matrix” System: Room-Neutral Liquid Cooling for Core Compute



PUE Efficiency in Tropical Climates

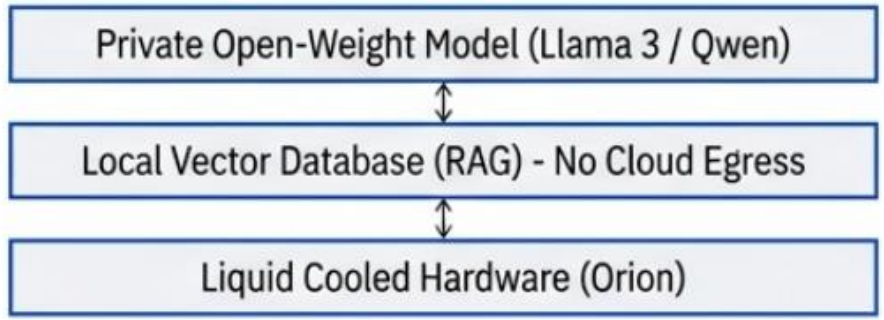


- **Core System:** Liquid-cooled rack system fully compliant with Open Compute Project (OCP) V3 Standards.
- **Thermal Architecture:** Blind-mate liquid backplanes + DTC cold plates support high-density GPU clusters (>50kW/rack).
- **Retrofit Capability:** Designed for “Room-Neutral” deployment—replaces legacy racks without raised floors or cold-aisle containment.
- **Impact:** Decouples compute density from facility cooling constraints.

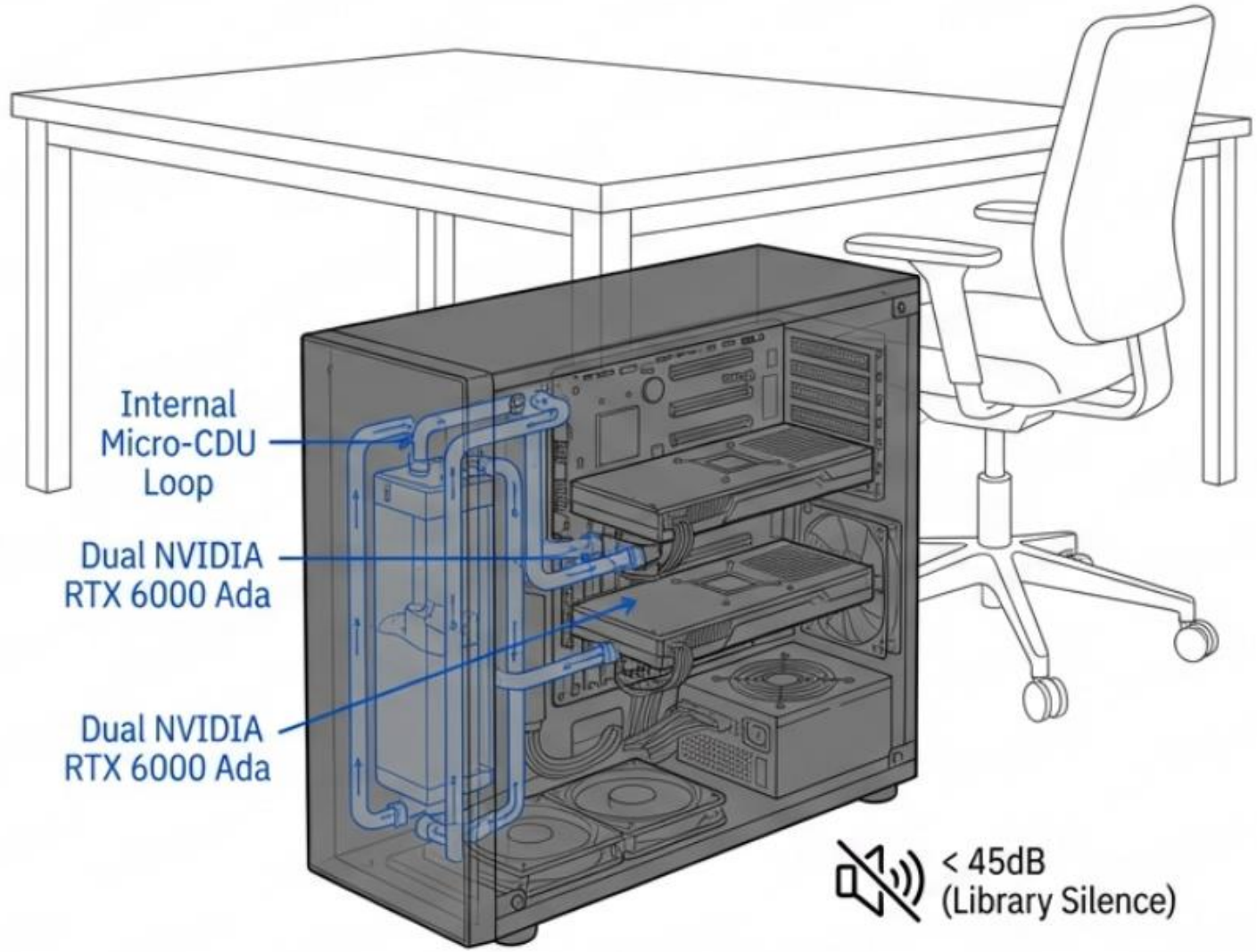
Cooperation Direction II: High-Performance Local AI on Liquid-Cooled Workstations

The ‘Orion’ Workstation: Data Sovereignty at the Edge

- **Capability**: Supports dual industrial GPUs for local Large Language Model (LLM) and Vision-Language Model (VLM) inference.
- **Environmentally Invisible**: Internal CDU loop eliminates high-RPM fans, removing heat and noise from the office environment.
- **Data Sovereignty**: Vector databases reside locally. Sensitive RAG data never leaves the premise (PDPA Compliant).
- **Deployment:** Plug-and-play on standard 13A office power sockets.



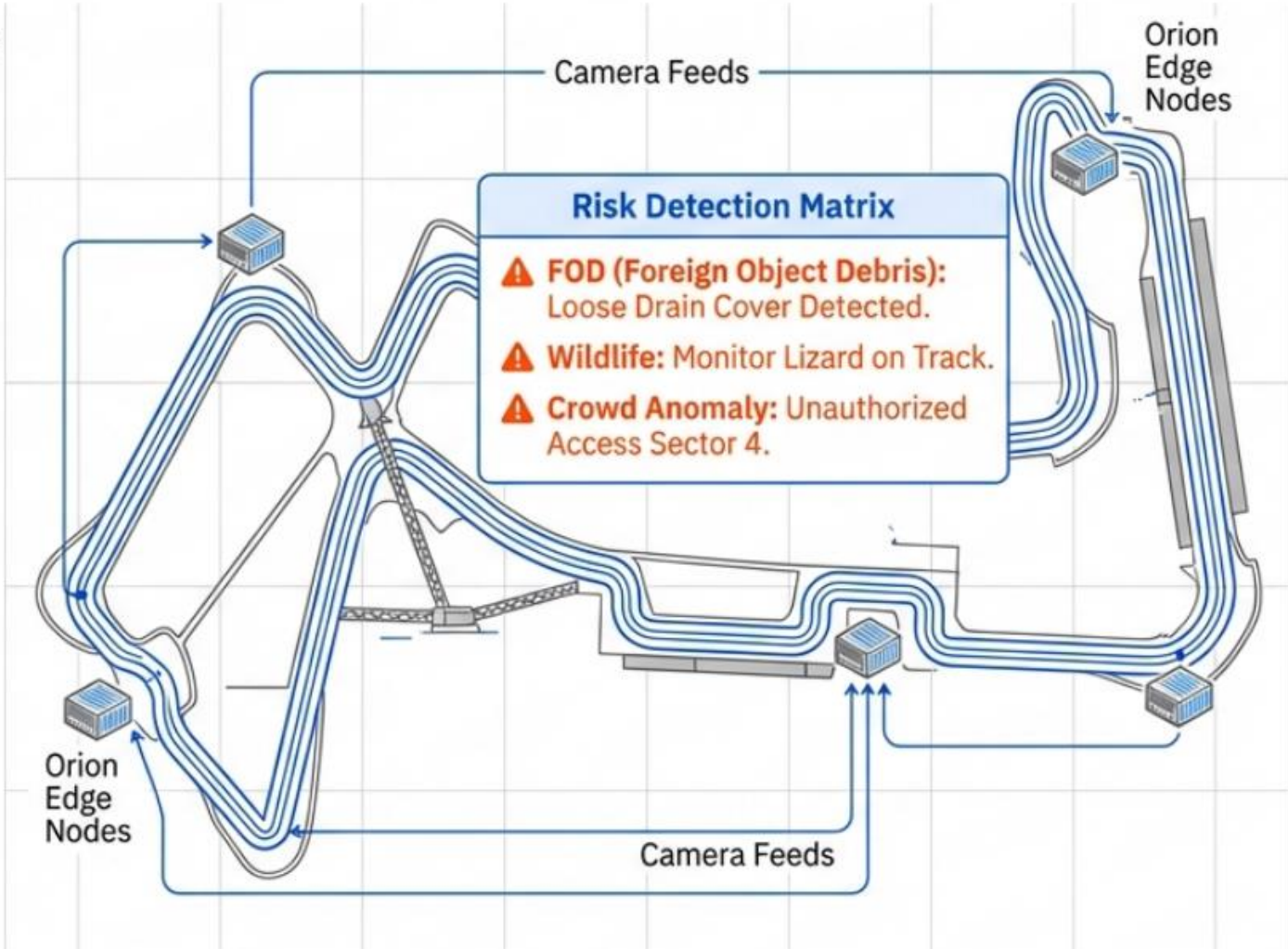
Layered Decoupling Architecture



Orion Workstation (Phantom View)

Scenario I: “The Digital Marshal” – Cognitive Security for High-Speed Events

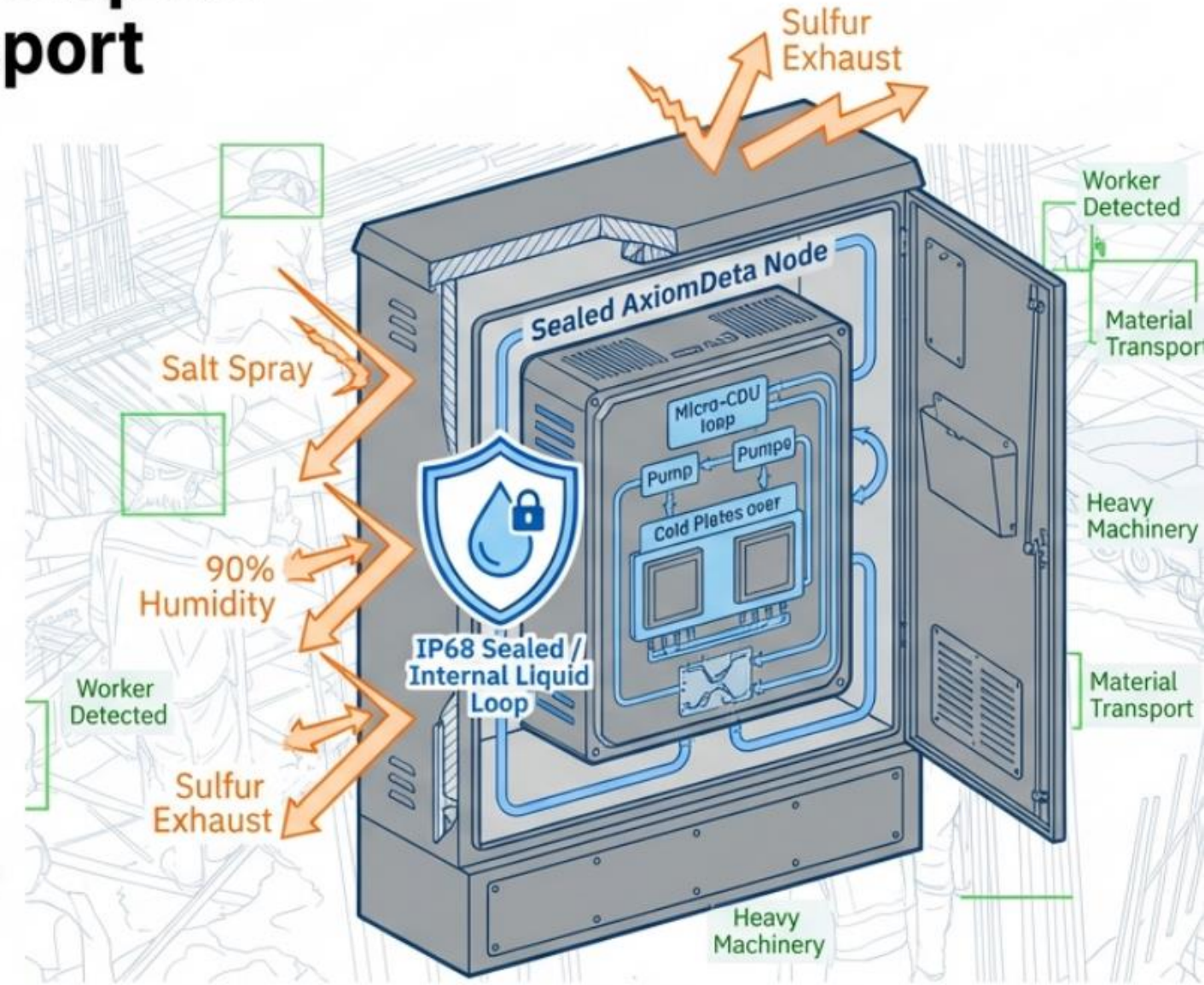
- **The Challenge:** 320km/h speeds require **<10ms latency**. Cloud analysis is too slow; 5G networks are congested during events.
- **The Solution:** Containerized Orion Edge Nodes deployed directly at command posts.



- **Cognitive AI:** Uses Vision-Language Models (VLM) to detect “long-tail” anomalies (e.g., wildlife, infrastructure failure) that standard AI misses.
- **Throughput:** Single node processes **50+ streams of 4K video** for real-time structural analysis.

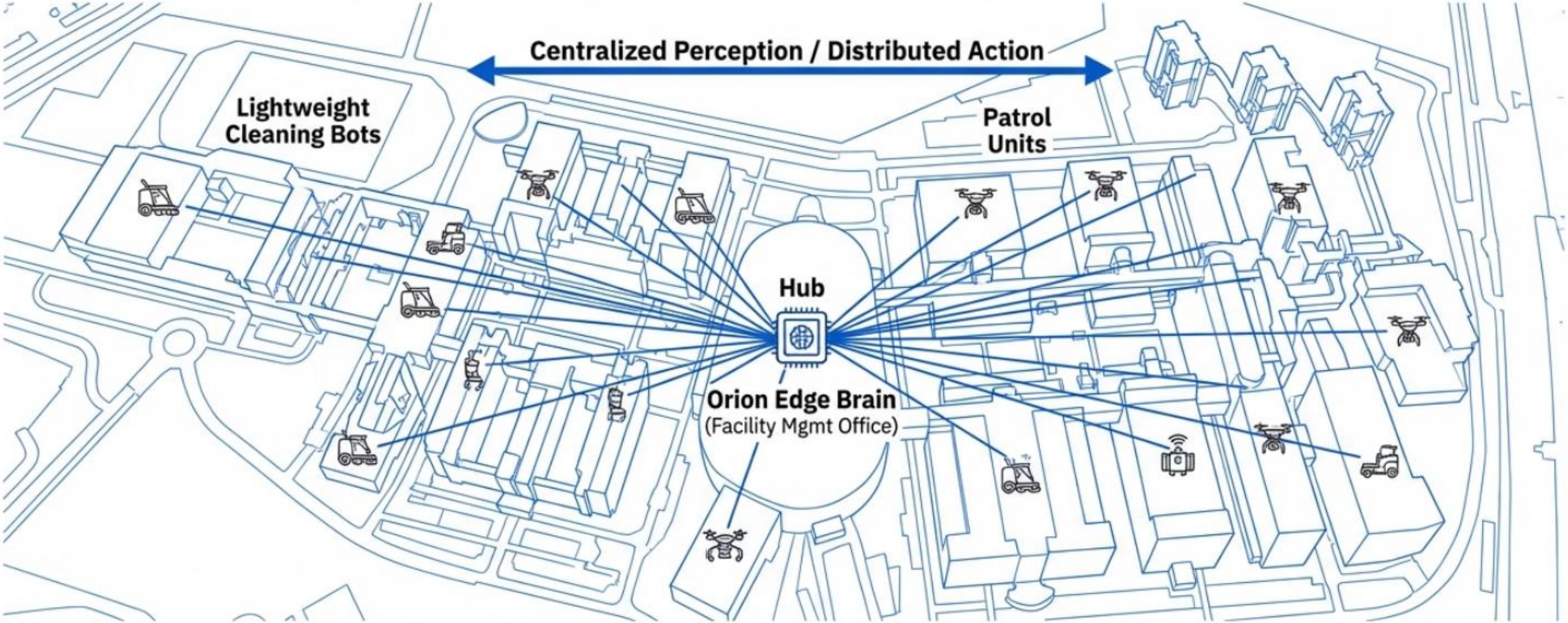
Scenario II: Resilient Edge Compute for Tropical Intelligent Transport

- **The Tropical Penalty**: Humidity and salt spray cause **Electrochemical Migration (ECM)**, killing standard air-cooled electronics in <2 years.
- **Engineering Defense**: Fully sealed IP68 chassis prevents ingress of sulfur, salt, and moisture.
- **Thermal Stability**: Liquid cooling maintains internal temps at $45-50°C, eliminating condensation cycles.
- **Durability**: Extends hardware service life by **40–50%** compared to air-cooled equivalents.



Roadside Unit (RSU) Cabinet with Sealed AxiomDeta Node (Cutaway View)

Scenario III: Campus-Scale Operations – The ‘Edge Cloud Brain’ Architecture



- **The Economic Problem**: Equipping every robot with high-end GPUs increases unit cost and drains batteries.
- **The Architecture**: One central Orion node handles heavy SLAM/Path Planning for the entire fleet via Private 5G.
- **Impact**: Reduces individual robot BOM (Bill of Materials) cost by **~40%**.
- **Living Lab**: Validates the ‘Campus as a Testbed’ model, integrating with NYP’s Digital Twin initiatives.