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Heterogeneous Compute Ontology

DEMONSTRATION PROGRAM // KEVINDJOHNSON.ORG/#DEMOS

51 BUILDS

DEC 2025 - JUN 2026

12+ SILICON ARCHITECTURES

A working body of 51 demonstrations on the BrainChip Akida and compute ontology stack, made possible with IBM Spectrum Symphony, LSF, and Storage Scale (GPFS), segmented by industry, by technology, and by what is most notable, innovative, and unique relative to the broader market.

Full details available at: kevindjohnson.org/#demos

SEGMENT I BY INDUSTRY & DOMAIN

- **Defense & National Security** 08
SymIntercept (missile defense) · SymSEAL (SOF hive mind) · SymHelmet / G1 squad · Shattered Crown (Lattice C2) · Non-Extractive Targeting · SymGrayZone · SymVulnerability · WorldMonitor
- **Financial Services & Capital Markets** 07
SymRail (freight signal) · Market Regime Classifier · Quantum-Neuromorphic Portfolio · Behavioral Biometrics · Palantir Cognitive Infrastructure · Conversational z/OS · PowerVS Actuarial
- **Healthcare & Public Health** 03
SymGenome (federated pathogen surveillance) · SymGenome II (nationwide outbreak detection) · SymHeart (mmWave vital signs)
- **Critical Infrastructure & Public Safety** 03
FireMesh (wildfire detection) · SymEventCamera (vehicle classification) · Cerebra (building-scale WiFi presence sensing)
- **Information Integrity & Trust** 03
Cognitive Integrity Standard (media manipulation scoring) · SymPalantir RAG (poisoning defense) · Neuromorphic Deepfake Voice MFA
- **AI Infrastructure & Enterprise IT** 12
Akida-as-vLLM · TENNs-LLM-1b serving · Distillation onto Akida · 100-model hot-swap · 20-chip LLM · Capacity (8,832 contexts) · Akida on LSF · vLLM+GPFS KV cache · Semantic router · KNN router app · GPU HBM storage tier · Quantum-Classical suite

SEGMENT II BY TECHNOLOGY

- T1 Neuromorphic LLM serving & inference** — Akida as a first-class vLLM backend; serving BrainChip's TENNs-LLM-1b; distillation onto Akida; 100-model hot-swap (11 ms); semantic / KNN routing.
- T2 Hive-mind distributed consensus** — SymSEAL (120 chips); G1 humanoid squad; the functional artificial brain; hive-mind music; NeuroDOOM; Cerebra mesh.
- T3 On-chip & online learning (STDP)** — Van der Made 2007 tone reproduction; full STDP-BCM functional brain with structural plasticity; Cerebra label-free online learning.
- T4 Heterogeneous & quantum-classical orchestration** — Quantum-neuromorphic portfolio (QPU+NPU+GPU); quantum-classical suite (Heron R3); conversational z/OS mainframe; GPU HBM storage tier; Akida on LSF.
- T5 Real-time sensor fusion & perception** — FireMesh (GOES/VIIRS/MODIS); SymEventCamera; SymRail; SymHeart (mmWave); WorldMonitor (10 OSINT domains).
- T6 Encrypted cognition, trust & provenance** — SymPalantir RAG; SymWisdom encrypted multi-domain cognition; SymIntercept (CKKS / QRNG / Shamir); deepfake voice MFA.
- T7 Autonomous ontology construction** — SymWisdom (the experiencing LLM); Ardenath; Non-Extractive Targeting; Palantir + Symphony cognitive infrastructure.
- T8 Orchestration substrate (Symphony / LSF / GPFS)** — 8,832 concurrent contexts at 99.4% scaling; three-tier GPFS KV cache replacing Redis; spike-driven HBM storage tier; cross-region cloud overflow.

SEGMENT III MOST NOTABLE

A Functional Artificial Brain across the AKD1000 Fleet

Reproduced BrainChip founder van der Made's complete neuromorphic vision — thalamus, hippocampus, limbic, cortex, structural plasticity — learning live rail video with no labels across 18,000+ classifications.

Akida as a First-Class vLLM Backend

Neuromorphic inference answering the same /v1/completions and /classify endpoints a GPU does, behind Red Hat AI — Akida drop-in for any enterprise stack, nothing downstream changed.

SymIntercept — Autonomous Missile Defense

A full kill chain under 200 ms against Mach 7+ threats, Rules of Engagement as governable Foundry ontology objects, N-of-M cryptographic sensor confirmation gating every engagement.

SymSEAL — 120-Chip Hive Mind for Special Operators

Ten operators share one neuromorphic perception layer — 120 Akida chips under a 30 W/helmet envelope, scaling to 1,000. The Anduril EagleEye concept on a real distributed substrate.

Akida V2 Capacity Demo

8,832 concurrent inference contexts across a 46-node cloud fleet at 99.4% of ideal scaling — proof neuromorphic scales horizontally in the data center, not only at the edge.

SEGMENT IV MOST INNOVATIVE

Heterogeneous Neuromorphic LLM — 1B parameters across 20+ chips as one network

Function-specialized chips wired as the layers of a single model, so the hardware topology is the model. To the author's knowledge, not demonstrated before.

Distillation onto Akida + Retrieval

A chip-sized state-space student holds the skill while retrieval carries the knowledge; facts updated at milliwatts by editing a file. A general recipe for neuromorphic LLMs.

Autonomous, Self-Assembling Ontology

Systems that discover, name, and structure concepts from continuous perception and crystallize them into Palantir Foundry — no human modeling required.

Encrypted Cognition

Homomorphic encryption (CKKS / OpenFHE) at the inference boundary with QRNG-seeded Shamir provenance — inference over data that is never decrypted.

Cerebra — WiFi as a Sense Organ

A self-organizing neuromorphic mesh turns ordinary WiFi radios into presence sensors, learning “normal” online with no labels — from a single room to a 40-floor building.

SEGMENT V MOST UNIQUE VS. THE BROADER MARKET

DIMENSION	THE MARKET	THIS WORK
The neuromorphic hive mind	Single-chip edge inference — keyword spotting, gesture, anomaly.	Fleets fused into one consensus-reaching, continuously-learning brain over shared GPFS state. A system, not a part.
Neuromorphic behind the standard API	Bespoke edge SDKs, isolated from the enterprise stack.	Akida answers the same vLLM / OpenAI endpoints as a GPU — drop-in. A bridge no chip vendor offers.
One ontology across NPU + QPU + mainframe	GPU-centric schedulers (Run:ai, Kubernetes) can't model neuromorphic or quantum tiers.	QPU, NPU, GPU, CPU, and z/OS scheduled under a single domain.
The chip inventor's full brain on silicon	No one has rebuilt it.	Van der Made's complete functional-brain architecture on production Akida — provenance tying this work to BrainChip's foundational IP.
Data products from public sensors	Satellite data services at >\$50k/yr.	SymRail rivals that freight visibility from public cameras on milliwatt chips — a data-marketplace business the field hasn't productized.

THE THROUGHLINE

Across every domain the differentiator is not just the chip but the **system around it** — a compute ontology that makes a fleet of neuromorphic chips behave as one learning brain, speaks the enterprise's standard APIs, and schedules neuromorphic alongside GPU, CPU, quantum, and mainframe under a single domain. That intersection is, at present, unoccupied by the broader market.