

Shattering the Sensor Silos: SOSA-Aligned 2U Hybrid Computing Node for Real- Time Multi-Domain Air Defense

Defense Applications



Modular open-architecture
computing node linking
disparate tactical air sensors
into a unified real-time
threat map.

Program / Platform Overview

Customer / Agency

U.S. Army / Joint All-
Domain Command and
Control (JADC2)

Platform / Program Name

Integrated Air and Missile
Defense (IAMD) Combat
Command Infrastructure

Mission Type

Real-time track correlation,
multi-sensor radar data
fusion, and tactical
command and control
processing.

Operational Environment

Tactical mobile shelter command
centers, forward operating bases,
and system integration labs
(SIL) executing continuous 24/7
airspace tracking in remote, high-
stress theaters.

Operational Challenge

- › **Proprietary Vendor Lock-In:** Legacy missile defense computing nodes rely on closed, single-vendor proprietary hardware blocks, creating severe integration friction and delaying critical technology refreshes for years.
- › **VPX to Datacenter Protocol Friction:** Consolidating real-time aerial sensor data from radar, satellites, and aircraft requires massive parallel compute power, but legacy tactical sensor form-factors cannot natively interface with open enterprise AI/ML software stacks.
- › **Exorbitant Lifecycle Costs:** Maintaining non-standardized electronics chassis across multi-domain fields exponentially escalates programmatic sustainment budgets and leaves weapon networks highly exposed to parts obsolescence.

OSS Solution

Torrey 2U Hybrid Server (MOSA / SOSA Aligned)



Compute / Storage / Expansion Capabilities



- › **Engineered** explicitly as a standard-setting Modular Open Systems Approach (MOSA) platform, integrating a massive compute core (supporting 48-Core Intel Xeon-D or up to 128-Core AMD EPYC Turin processors) with up to 3 SOSA-aligned, high-speed 3U VPX/SOSA I/O bays. This allows the server to act as a powerful hybrid translation bridge, linking cutting-edge Open Compute Project (OCP) enterprise acceleration directly onto legacy sensor bus topologies within a single software-defined system.

Integration & Deployment



- › **SIL-to-Field Lifecycle Paving:** Provides an identical open-system blueprint across System Integration Labs (SIL) and field hardware deployments, cutting engineering validation schedules from quarters to weeks.
- › **Unified Fabric Telemetry Integration:** Powered by an advanced U-BMC Redfish management loop that seamlessly bridges standard OpenBMC datacenter control protocols with legacy standard SOSA system management backplanes.
- › **Mil-Spec Structural Protection:** Ruggedized 2U short-depth chassis built and exhaustively tested to comply with MIL-STD-810H and DO-160G parameters for deep thermal stress, heavy mechanical shock isolation, and cross-platform logistics transport profiles.

Mission Impact



- › **Microsecond Track Resolution:** Slashes multi-sensor signals cross-correlation lag down to microsecond intervals, giving tactical commanders a unified, latency-free tracking map against high-velocity air threats.
- › **Absolute Investment Protection:** Secures multi-decade deployment viability by allowing individual sensor cards, networking chips, or computing modules to be swapped out independently without triggering a full system re-design.
- › **Seamless Interoperability Compliance:** Eradicates cross-service communications silos to deliver an uncompromised, resilient air defense picture straight to the joint tactical network.

Additional Information

The Torrey 2U Hybrid server serves as the entry-level standard architecture for the comprehensive OSS Tamarack product line, positioning our IP directly at the heart of emerging CMFF, SAVE, and airborne hybrid defense requirements. By combining a powerful open-datacenter computing core with strict SOSA-aligned configuration guard rails, this solution equips defense primes to deploy standard enterprise AI and sensor-fusion stacks directly onto the battlefield. This approach bypasses legacy proprietary traps and establishes an upgrade loop that matches the speed of commercial silicon innovation.