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RES One

Component Interchangeable Rugged Servers

Keep pace with constant technology evolution

- Deploy one server platform for 20+ years
- Mitigate technology disruption
- Eliminate costly redesigns
- Lower lifecycle cost of ownership
- Intel Xeon 6 Processors (80 cores)
- NVIDIA RTX 6000 GPU

"I need an edge server that won't force me into costly platform redesigns every 5-7 years as components go EOL, so I can focus budget on mission capabilities instead of integration rework."

– Program Manager, Prime Defense Contractor

RES One addresses the disruption caused by rapidly evolving commercial technology, bridging the gap between fast-paced tech evolution and the 20+ year lifecycles of defense platforms.

RES One enables seamless technology refresh without the need for external platform changes, dramatically reducing total cost of ownership. Built on OCP (Open Compute Project) and DC-SCM (Data Center Secure Control Module) standards, this architecture accelerates upgrade cycles to maximize system capabilities while balancing operational stability throughout the program lifecycle.

Highlights

- Deploy one edge server platform for 20+ years with seamless internal technology upgrades (CPU, memory, accelerators) without external platform changes
- Eliminate costly mid-program redesigns caused by component obsolescence
- Rapid technology insertion (months vs. years) as algorithms and accelerators evolve
- Delivers economies of scale across multiple programs and domains (air/sea/land/subsea)
- Lead time 10 weeks or less, depending on configuration & component availability

1	<10	20+
platform chassis	week delivery	years lifecycle

OPEN COMMUNITY®

TECHNICAL SPECIFICATIONS

Scalable Architecture

- **OCP Type 2 Motherboard -** Industry-standard platform ensuring long-term firmware support and upgrade flexibility
  - **Single Socket:** Standard configuration
- **Flexible Form Factors -** Available in 1U and 2U configurations (3U on product roadmap)
- **Pre-defined Flex Zones -** Modular design decouples high-change silicon from stable architecture
- **Common Core Architecture -** Shared CPUs, RAM, power, data, and firmware infrastructure across product line

Lifecycle Management

- **Actively Managed AVL -** Approved component list for end-of-life management
- **Class II Change Authority -** Maintains form/fit/function while managing component obsolescence
- **Technology Refresh Alignment -** Synchronized with DoD platform service lives
- **Field-Replaceable Components -** Maximized field serviceability with electronic installation guides

Performance

- Supports Intel **Xeon 6, up to 350W (82C)** with 4TB 8000 MT/s ECC DDR5 RDIMM or 6400 MT/z ECC RDIMM
- Supports **NVIDIA Blackwell 600W** GPUs

Expansion & I/O

1U Configuration

- **PCIe Slots:** Minimum one X16 FHHL and one X16 HHHL slot
- **OCP Slot:** OCP 3.0 networking module slot (dedicated)
- **Expansion Slots:** Up to two additional HHHL X16 slots
- **Storage Bays:** Maximum two 15mm U.2 NVMe bays
- **Rear I/O:** Primary interface location (front I/O on roadmap

2U Configuration

- **PCIe Slots:** Minimum one X16 FHHL and one X16 HHHL slot
- **OCP Slot:** OCP 3.0 networking module slot (dedicated)
- **Expansion Slots:** Up to three additional FHFL Dual Slot X16 cards
- **GPU Support:** One double-width 450W GPGPU slot
- **Storage Bays:** Maximum eight 15mm U.2 NVMe bays

Physical Specification

- **Standard:** 19-inch rack mount (CEA-310-E compliant)
- **1U Depth:** Maximum 21 inches
- **2U Depth:** Maximum 21 inches

Environmental & Ruggedness

(MIL-STD-810H)

Operating Environment

- **Temperature:** 0°C to +40°C (extended range configurations available)
- **Storage Temperature:** -46°C to +70°C
- **Humidity:** 3% to 100% relative humidity
- **Altitude:** 0 to 15,000 ft operating; 0 to 40,000 ft storage

Mechanical Durability

Tested to:

- **Operating Shock:** 30G, 20ms
- **Non-Operating Shock:** 40G, 11ms
- **Vibration:** MIL-STD-810H Method 514.8 compliant
- **EMI/EMC:** MIL-STD-461G CE102 and RE102

Reliability

- **Design Life:** 20+ years form/fit/function stability
- **MTBF:** Calculated per MIL-Handbook-217F Notice 1
- **Warranty:** Standard 1-year with optional extensions

Security Features

- **TPM 2.0** or higher support
- **Secure Boot** functionality
- **Preconfigured and integrated** options from leading software vendors
- **Self-Encrypting Drive (SED)** support with integrated key management
- **SED RAID** Support for encrypted storage arrays
- **System-hardening and Linux security** through integration with Mercury's RelianceOne Linux Security platform.

Modular Architecture with Stable External Interfaces

- **OCP Motherboard standard** decouples silicon from chassis, enabling CPU/memory/accelerator upgrades without external platform changes
- **DC-SCM (Data Center Secure Control Module)** decouples I/O (Gen 1) and BMC management (Gen 2) from motherboard
- **Standardized internal power and data** buses enable "plug and play" component replacement
- **Result:** Drop-in technology refresh without rewiring, retraining, or re-qualification

20+ Year Form-Fit-Function Commitment

- Platform for 20+ years with stable external interfaces
- Chassis form factor, I/O locations, power connections, and physical mounting remain constant
- Internal component evolution (single to dual socket, new accelerators, advanced cooling) happens transparently
- **Result:** One integration effort supports entire program lifecycle vs. multiple redesign cycles

Purpose-Built Harsh Environment Design with Advanced Thermal Management

- Ruggedized for extreme temperature, shock, vibration, dust, and EMI environments where commercial servers fail
- **Optional liquid cooling architecture** for high-density AI/ML processing in confined spaces (surface ships, submarines, aircraft, unmanned vehicles)
- **Extensible environmental design** validated through risk reduction testing
- **Intel Xeon 6 processors with Secure Boot, DDR5 memory, PCIe Gen5** (4x x16 slots + 1x EDSFF) for AI accelerators and high-bandwidth sensor processing
- **Result:** Data center-class performance in tactical edge environments

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