

Single-Site Enterprise Hyperconverged Infrastructure (HCI)

1. Executive Summary & Architectural Scope

This Request for Proposal (RFP) defines the technical requirements for procuring an end-to-end, single-site Enterprise Hyperconverged Infrastructure (HCI) deployment and dedicated network switching infrastructure.

The compute and storage layer consists of an isolated 3-node HCI cluster utilizing local enterprise All-Flash Solid State Drives (SSDs) to provide at least **5 TB net usable storage capacity**, while populating a **maximum of 50% of server drive bays** on initial delivery.

- **Approved Server Hardware Vendors:** Exclusively **HPE, Lenovo, or Dell EMC** in a strict **1U rack-mount form factor**.
- **Approved Network Switch Vendors:** Exclusively **Cisco, Aruba, Arista, or Juniper**.
- **Approved Virtualization Platforms:** Exclusively **VMware or Nutanix** fully integrated HCI software stack.
- **Cluster Usable Capacity & Bay Rule:** Minimum **5 TB net usable SSD capacity** across the cluster, utilizing $\leq 50\%$ of available front drive slots per node upon delivery.
- **Storage Media:** 100% Enterprise-class Hot-Plug Solid State Drives (SSDs) with power-loss protection and minimum 1 to 3 DWPD endurance.
- **Processor Architecture:** Single-socket (1x CPU) 16-Core processor with Hyper-Threading (minimum 3.4 GHz base frequency) per server node.
- **Transceiver Supply:** Supplier must provide **24x 10/25 Gbps SFP28 transceivers/DACs** alongside all patch cords and power cables.

2. HCI Compute & Storage Node Specifications (3x 1U Nodes Total)

Each HCI node must be an enterprise-class 1U rack server meeting or exceeding the following specifications:

Parameter	Technical Requirement
Approved Vendors	Exclusively HPE, Lenovo, or Dell EMC.

Parameter	Technical Requirement
Form Factor	Strictly 1U Rack-Mount Server with sliding toolless rack rails and cable management arm.
Processor	Single-Socket (1x CPU) Enterprise x86 Architecture. • 1x 16-Core Processor with Hyper-Threading (16 Cores / 32 Threads per node; 48 Cores / 96 Threads total across the 3-node cluster). • Base Frequency: Minimum 3.4 GHz.
System Memory	Minimum 512 GB DDR5 RAM per node (1.5 TB RAM total across the 3-node cluster). • Populated using Enterprise DDR5 Registered ECC RDIMMs.
Local Boot Media	Dual minimum 2x 480 GB Enterprise SSDs configured in hardware RAID 1 via dedicated internal boot controller.
HCI SSD Media & Slots	• Media Type: Enterprise Hot-Plug 2.5" SFF Solid State Drives (NVMe / SAS SSD) with hardware Power-Loss Data Protection (PLP). • Drive Bay Utilization: Maximum 50% of total front drive slots populated upon delivery (e.g., in an 8-bay chassis, maximum 4 SSDs per node installed, leaving 4 slots empty with drive blanks for future online capacity scaling).
Network Interfaces	Minimum 4 x 25GbE SFP28 ports per node for hypervisor management, VM traffic, live migration, and storage cluster replication.
Out-of-Band Mgmt	Dedicated 1GbE RJ-45 Out-of-Band Management Port with HTML5 remote console functionality.
Power Modules	Dual (2x) Hot-Swap 1+1 Redundant Power Supply Units (PSUs) (Platinum/Titanium efficiency rating).

3. Hyperconverged Software-Defined Storage (SDS) Specifications

The storage architecture is software-defined and distributed across the internal enterprise SSDs of the 3 HCI nodes.

Parameter	Technical Requirement
Storage Architecture	Fully distributed Software-Defined Storage (SDS) pooling internal node SSD drives into a single unified cluster datastore.
Storage Media Tier	100% Enterprise All-Flash SSD Tier. (Zero mechanical HDDs allowed).
Cluster Usable Capacity	Minimum 5 TB Net Usable SSD Storage Capacity across the 3-node cluster.
Data Resiliency	High-availability software-defined storage architecture ensuring data availability and VM continuity during drive or node failures.
Slot Expansion Rule	50% of front drive slots per node must remain unpopulated and available for online storage expansion.
Storage Services	Inline Deduplication, Compression, Distributed Snapshots, Thin Provisioning, and automated background rebuilds.

4. Network Switch Specifications

The proposed switching infrastructure must provide line-rate, non-blocking L2/L3 switching tailored for high-throughput HCI east-west storage traffic and VM uplinks.

Parameter	Technical Requirement
Approved Vendors	Exclusively Cisco, Aruba, Arista, or Juniper.

Parameter	Technical Requirement
Port Density	Minimum 48 x 1/10/25 Gbps SFP28 ports .
Uplink Interfaces	Minimum 2 x 40/100 Gbps QSFP28 uplink ports .
Power Architecture	Dual (2x) Hot-Swap Redundant Power Supplies (PSUs) is mandatory with redundant hot-swap fan trays.
Multi-Chassis LACP	Must support Multi-Chassis Link Aggregation (e.g., MLAG, MC-LAG, or equivalent cross-switch link bonding) for active-active link redundancy.
L2/L3 Features	Full 802.1Q VLAN tagging, Jumbo Frames (MTU 9000+), LACP, IGMP Snooping, Priority Flow Control (PFC), and dynamic routing.
Form Factor	Compact 1U Rack-Mount form factor with toolless rack-mounting rails.

5. Required Cable, Optics & SFP Transceiver Supply List

The supplier is strictly required to **supply and deliver 100% of all required cabling, Fiber Optic patch cables, and transceivers.**

Cable / Module Type	Supplied Quantity	Technical Specification
SFP28 Transceivers	24 Units	24x SFP28 10/25 Gbps Optical Transceivers (or high-grade Direct Attach Copper cables) fully compatible with the proposed servers and switches (12 for 3 nodes + 12 for switch side).
Fiber Optic Cables	12 Units	High-Speed LC-LC Multimode OM4 Fiber Patch Cables.

Cable / Module Type	Supplied Quantity	Technical Specification
Power Cords	10 Units	Heavy-Duty IEC C13-C14 / C19-C20 Power Cords matched to rack PDUs (6 for nodes + 4 for switches).

6. Hypervisor & HCI Platform Licensing Scope

The provider must submit a proposal using one of the following approved software platforms:

- **Complete Software Scope:** Whichever platform is proposed, the provider must include 100% of the software licenses, storage capacity licenses, management control plane virtual appliances, and prerequisite operational feature sets.
- **Core Coverage:** All software subscriptions must cover 3 physical nodes, 3 CPU sockets, and **48 total physical CPU cores** (16 cores per node).

7. Warranty & Service Level Agreement (SLA)

- **Hardware Support:** All delivered hardware—including 1U compute nodes, internal enterprise SSDs, network switches, 25GbE SFP28 transceivers, cabling, and power supplies—must include **36 months (3 years)** of 24/7 OEM on-site support and warranty coverage.
- **Software Support:** All HCI software licenses, hypervisors, software-defined storage modules, management control plane tools, switch operating system licenses, feature subscriptions, security updates, and OEM software support must be fully covered for the same **36-month term**.