

**SECTION V: TECHNICAL SPECIFICATIONS
(TECHNICAL REQUIREMENTS) / BUSINESS
REQUIREMENT DOCUMENT**

Servers for HCI Solution (Quantity - 03)

Requirements	
Form Factor	2U Rackmount Chassis
Drive Bays	Minimum 16 2.5-inch Drives or higher
Processor	2 x Latest 6 th Gen Intel® Xeon CPU with 16 Cores or Higher
CPU Generation	6th Gen Intel CPU or higher
Memory	512GB RAM Using DDR5 or Higher (Must utilize a configuration that leaves free slots available to Support Equal Future RAM expansion)
System Disk	2 x 480GB 6Gbps SATA SSD or Higher dedicated for OS
Storage	Minimum 45TB or higher using NVMe SSD or Higher (Must utilize a configuration that leaves free slots available to Support Equal Future Storage expansion)
Riser Card	Should support minimum 6 PCIe slots or higher
Network Card	04 -Port 1GE Copper Interface Ethernet Adapter or Higher
	2 x Dual-Port 25G or Higher Adapter with transceivers
Raid/Storage Controller	Enterprise Storage Controller compatible with NVMe and HCI deployment model. For OS disks, a hardware-based RAID-1 or Higher mirroring must be supported
Power Supply	Redundant Power Supply with Power Cables
Rack Mount Rail	Complete Rail Kit including Cable Management Arm
Front Bezel Support	Front Security Bezel
Management Software	Embedded Server Management Software as per standard requirement with all licenses or Higher
End of Life	The offered server model must be current production line at the time of bidding and must not reach EOL status within the next 5 years from the date of final acceptance. (A formal OEM Confirmation Letter is mandatory)
Warranty	5 Years NBD warranty support & Services backed by OEM

Network Switches (Quantity - 02)

Requirements	
Form Factor	Rack Mountable Switch
Switching Capacity	Minimum 800 Gbps or Higher
Packet Forwarding Rate	Minimum 595 Mpps or higher
Ports	• Minimum 16 × 25G ports - Loaded with original equipment manufacturer (OEM) transceivers for the connectivity with all other devices in this Procurement. • All high-availability (HA) or Inter-Switch Link (ISL), or switch clustering ports must be provided as additional, dedicated interfaces over and above the required 16 x ports.
Memory	Minimum Switch RAM 2GB or higher & Switch Flash minimum be 1GB or Higher
VLAN	Minimum 4K or more VLANs support and at least 32K MAC address entries
Layer 3 Features	Must be a Manageable Switch with Layer-3 features
High Availability	Support Stacking /MLAG or equivalent, 02 x Switches must be configured in Active-Active HA architecture. All required inter Switch Link high speed cables must be provided
Management	CLI/ GUI/ SNMP/ Syslog
Feature Support	Must support Jumbo Frames
Security Feature	Should support standard security features
Power Supply	Redundant Power Supply
Cables/Passive Equipment	Complete Connectivity cables and passive equipment required for the fully functional operational deployment of both Switches
End of Life	The offered model must be latest at the time of bidding and must not reach EOL within next 5 years from the date of acceptance. (OEM confirmation letter shall be provided)
Warranty	5 Years NBD warranty support & Services backed by OEM

Management Switches (Quantity - 02)

Requirements	
Form Factor	Rack Mountable Switch
Ports	• Minimum 24 x 10/100/1000 Base-T ports. • Minimum 04 x 10G SFP+ Ports fully populated with OEM Transceivers.
Switching capacity	Minimum 128 Gbps or more
Forwarding Rate	Should be more than 94 Mpps or higher
Layer 3 Features	Should be a Manageable Switch with Layer-3 features such as Static Routing, RIP or equivalent and support inter VLAN routing to segment traffic.
VLAN	Should have 4K or more VLANs support and 16K MAC address entries
Management	CLI / GUI / SNMP
Security	Should support standard Basic security features
Cables/Passive Equipment	Complete Connectivity cables and passive equipment required for the fully operational deployment of both switches
End of Life	The offered model must be latest at the time of bidding and must not reach EOL within next 5 years from the date of acceptance. (OEM confirmation letter shall be provided)
Warranty	5 Years NBD warranty support & Services backed by OEM

Next Generation Firewall (Quantity – 01)

Requirements	
Raw Firewall Throughput	Minimum 30 Gbps or Higher
IPS Throughput	Minimum 7 Gbps or Higher
Threat Protection Throughput	Minimum 6 Gbps or higher
IPSec VPN Throughput	Minimum 25 Gbps or Higher
NGFW Performance	Minimum 7 Gbps or Higher
Ethernet Interfaces	Minimum 8 x 1GE copper Minimum 2 x SFP fiber Minimum 2 x SFP+ 10 GE fiber with fully populated with original OEM transceivers.
SSL/TLS Inspection	Minimum 2 Gbps or Higher
Required Features	Web Application Firewall, Webservers Protection, Application Control, URL Filtering, Anti-Malware, Reporting feature must be included
License & Subscription	All threat signature feeds, security subscriptions, Web Application Firewall updates, and firmware feature licenses must be fully active for a minimum duration of 5 Years.
Power Supply	Redundant Power Supply
Cables/Passive Equipment	Complete Connectivity cables and passive equipment required for the fully functional operational deployment of the firewall
End of Life	The offered model must be latest at the time of bidding and must not reach EOL within next 5 years from the date of acceptance. (OEM confirmation letter shall be provided)
Installation	Firewalls shall be installed and configured under the supervision of OEM
Warranty	5 Years NBD warranty support & Services backed by OEM

Backup Appliance (Quantity - 01)

1. System Architecture & Capacity

- **Appliance Standard:** The proposed solution must be an enterprise-grade backup storage appliance.
- **Production Pool Capacity:** The production backup repository must provide a minimum **12TB net usable capacity** from day one, after accounting for all RAID overhead and system files.
- **Scalability Path:** The appliance architecture must support scale-up storage capacity expansion to accommodate future organization growth.
- **Compression & Deduplication:** The appliance must natively support and perform Compression and Deduplication to maximize storage efficiency and reduce network traffic.

2. Network Integration & Connectivity

- **Infrastructure Compatibility:** The appliance must be fully integrated with the Hardware including servers, network switches, and Hyperconverged Infrastructure (HCI).
- **Data Transport:** The appliance must communicate with all other production and network equipment over a dedicated 25Gb (or higher) connectivity channel to ensure high-speed data transfers.

3. Core Cyber Resilience & Ransomware Defense

- **Comprehensive Protection:** The proposed solution must be fully capable of complete, end-to-end data protection, ensuring data remains clean, uncorrupted, and isolated from ransomware, malware, and viruses.
- **Self-Defending Mechanisms:** The appliances must feature an IDS/IPS security mechanism paired with advanced ransomware protection (including anomaly detection and deep malware scanning) ensuring every single bit of stored data is actively protected.
- **Full Cyber Resilience:** The entire solution must maintain complete cyber resilience, featuring that prevent infected data from contaminating clean backup sets.

4. Isolated Environment

- **Air-Gapped Architecture:** A true air-gapped logically architecture provisioned with dedicated storage of **at least 12TB (or higher)**, matching the production capacity must be implemented to separate the active Production Backup environment from the secure Cyber Recovery environment.
- **Immutable Storage:** The repository must utilize strict immutable/WORM (Write Once Read Many) data locking to ensure backup copies cannot be modified, deleted, or encrypted by any malicious actor or compromised administrative account.

5. Licensing, Lifecycle, & OEM Support

- **All-Inclusive Licensing:** Any and all required software licenses, operating systems, security features, update subscriptions, and management tools must be included in the baseline solution at zero extra cost.
- **Turn-Key Deployment:** The complete solution must be deployed and configured under the direct engineering supervision of the Original Equipment Manufacturer (OEM).
- **Lifecycle Guarantee:** The offered appliance model must be current-generation at the time of bidding. It must be explicitly guaranteed **not to reach End-of-Life (EOL) within the next 5 years** from the date of final acceptance. An official, signed OEM confirmation letter must be attached to the bid.

Service Level SLA: The solution must include a **05-year Next Business Day (NBD) hardware warranty**, software patch support, and professional services backed directly by the OEM.

Hyper Converged Infrastructure (HCI) Solution

The solution must:

- a) Provide software-defined HCI architecture
- b) Support KVM-based or equivalent virtualization platform
- c) Offer unified management interface (web-based)
- d) Support x86 hardware platforms
- e) Use distributed architecture with shared resource pooling.
- f) Support Replication of virtual machines running on Primary site to DR site with no minimum Hardware restriction allowing to replicate on even a single server at DR site (OEM Confirmation letter is required)

1. Compute Virtualization (Major Features)

- a) Full VM lifecycle management (create, clone, snapshot, delete)
- b) Live VM migration and storage migration without downtime
- c) Hot add support (CPU, Memory, Disk, NIC)
- d) NUMA awareness, HugePages
- e) Resource reservation, prioritization, and isolation

2. Storage Virtualization (Major Features)

- a) support VM-level policy-based, allowing each VM to be configured with 2-copy or 3-copy redundancy **or** 2-copy / 3-copy redundancy at Storage Pool level (Usable Storage should be 50TB with 3-copy).
- b) Distributed storage cluster (minimum 3 nodes)
- c) SSD caching & all-flash support
- d) Thin provisioning
- e) Automatic data reconstruction and rebalancing
- f) Support iSCSI and NFS natively, and support CIFS/SMB and S3 either natively or via integration or external gateway

3. Network Virtualization (Major Features)

- a) Support Standard and distributed virtual switches
- b) Support VLAN (802.1Q), QoS, ACL support
- c) Support Distributed firewall (micro-segmentation) native or via integration
- d) SR-IOV and DPDK support
- e) Port mirroring, DHCP, link aggregation
- f) Support Basic End-to-end network visibility and monitoring

4. High Availability & Disaster Recovery

- a) Should Support VM High Availability (auto restart on failure)
- b) Live migration for maintenance (no downtime)

- c) Support Dynamic Resource Scheduling (DRS) or equivalent
 - d) Support Disaster recovery with asynchronous replication
- 5. Security (Major Features)**
- a) The platform shall support role-based access control (RBAC), authentication (LDAP/2FA), audit logging, and basic secure data erasure.
- 6. Management & Operations**
- a) Centralized web-based management platform
 - a) Real-time dashboard and monitoring
 - b) One-click operations (health check, restore, cleanup)
 - c) Detailed reporting and analytics (host, VM, storage)
 - d) Built-in migration tools (P2V, V2V)
 - e) Support basic AI-driven capacity prediction
- 7. Scalability**
- a) Cluster scalability up to 64 nodes
- 8. Flexible node roles:**
- a) Online horizontal scaling without downtime
- 9. Backup & Data Protection**
- a) The solution must have VM-level backup function (full, incremental).
 - b) The system shall support scheduled and on-demand backups.
 - c) The solution shall support snapshot-based backup and restoration.
 - d) The platform shall support remote replication for disaster recovery.
- 10. Interoperability & Compatibility**
- a) The platform must support multiple guest operating systems including Windows, Linux distributions, and enterprise network virtual appliances.
 - b) The solution shall support OVF/OVA import/export and enable migration from third-party virtualization platforms (e.g., VMware, Hyper-V).
- 11. Installation, Configuration Support & Services**
- a) The solution shall be installed and configured under the supervision of OEM.
 - b) 05 Years warranty support and services.

Operating System (Quantity - 06)

Requirements
Microsoft Windows Server Standard 2025 or Higher - 16 cores

Database Software (Quantity - 02)

Requirements
Microsoft SQL Server Standard 2025 or Higher - 2 Core

Endpoint and Server Protection (Solution)

Requirements	
Endpoint Protection for Users/Workstations	Quantity - 30 covering user workstations and laptops (supporting Windows and macOS platforms)
Endpoint Protection for Server Virtual Machines	Quantity - 20
Anti-Malware & File Scanning	The solution must utilize an advanced, signatureless deep learning or behavioral Artificial Intelligence (AI) engine to execute real-time file scanning. The Solution must block known malware, ransomware variants, trojans, fileless attacks, and zero-day exploits pre-execution. The system must perform on-access, on-demand, and scheduled system file scans without manual intervention.
Advanced Ransomware Protection	The solution must contain a dedicated ransomware protection engine that monitors file-system modification metrics and cryptographic activity.
Features Set	Web filtering & Content Control, Application Control, Device Control, data loss prevention
Centralized Management	Both the 30 User Endpoints and 20 Server Workloads must be managed though a Unified, Centralized Console.

Support & Subscription	All threat signature feeds; security subscriptions, updates, and firmware feature licenses must be fully active for a minimum duration of 5 Years .
Installation	The solution shall be installed and configured under the supervision of OEM

Network Monitoring Solution

Core Requirements	Architecture: Modular, vendor-agnostic, supports cloud/on-premises/hybrid deployments, with proxy-based remote monitoring. - Access Control: Role-Based Access Control (RBAC), Multi-Factor Authentication (MFA), and TLS encryption. - Scalability: Suitable for small, medium, and large enterprise environments.
Monitoring & Data Collection	Real-time monitoring of servers, endpoints, network devices, cloud resources, IoT devices, databases, and applications. - Supported protocols: SNMP, WMI, API, SSH, ICMP, etc. - Device auto-discovery with classification and topology mapping. - Endpoint visibility (CPU, memory, storage, OS version). - SLA monitoring for security devices and IT infrastructure.
Alerts & Automation	Threshold-based alerts (email, SMS, Slack, Microsoft Teams). - Anomaly detection and escalation policies. - Automated maintenance mode - Script execution.
Visualization & Reporting	Real-time dashboards, network topology maps - Scheduled/custom reports (SLA, resource usage, performance trends). - Custom KPI builder with trend forecasting capabilities.

Security & Compliance (Monitoring-Focused)	- Log collection from monitored devices for operational insights. - Interface and service status tracking. - Historical performance baselines to identify deviations.
Licensing & Support	- Should cover all devices in the complete solution - Flexible: Per-device/user or subscription. - 05 Years Support & Subscription
Installation	The solution shall be installed and configured under the supervision of OEM

Passive / Miscellaneous Equipment

Requirements	
Items	Quantity
Smart Android LED 85" Built in wifi, LAN, HDMI, Cast, 05 Years Warranty	02
External SSD Drive 2TB or above with 05 Years Warranty	03
Managed Power Distribution Unit (PDU) Units Monitored & Managed through network. Should be designed for optimal power load. PDU must be enabled with voltage/ Ampere monitoring, Built in Temperature and Humidity Sensor Kits. 05 years warranty, support and services	02
UPS Battery Bank 48V – 100AH or Higher Lithium Technology compatible with 5KVA APC UPS Model SU5000 Installation and Configuration with 05 Years Warranty, support and services	02
Air Condition Sequencer – Time based and temperature control Sequencer for AC Installation and Configuration with 05 Years Warranty, support and services	01
Anti-Static Vinyl Flooring for datacenter Area 42 x 40 Square Feet Installation, support and services and 05 years replacement warranty	Job
Patch Pannel 24 Port	02
Cable Manager 1U 24 Port	02
Patch Cord (03 Meter)	20
Patch Cord (05 Meter)	10