

Supply, Installation, Configuration, and Integration of Compute Expansion and Storage Expansion

1. Compute Node – 1 Bundle

#		Minimum Specification	✓
1.1	Form Factor:	2U Rack Server	
1.2	Processor	2 Nos × Intel Xeon Silver 4514Y(2.0GHz/16-Core/30MB/150W)	
1.3	Memory	- Up to 48 × DDR5 DIMM slots - Supports up to 12 TB memory capacity. - Installed: 4 Nos x DDR5 RDIMM, 64GB, 5600MT/s, 2Rank"	
1.4	Storage	- Flexible hot-swappable storage supporting HDD/SDD Chassis - Suported number of hot-swappable 2.5"" drives: ≥ 33 - Installed Drives: 2 Nos x SSD, 960GB, SATA 6Gb/s, RI, 2.5inch" - Should have installed RAID controller card with cache capacities of no less than 4 GB and supports RAID 0/1/10/5/50/6/60/10. - A supercapacitor for power-off protection should be included. - Suported number of hot-swappable 2.5" drives: ≥ 33	
1.5	Networking	- Installed: 1 x OCP3.0 Ethernet Adapter 25GE Dual Port-SFP28 - Should include 2 x High Speed Cable, 25G SFP28 Passive High Speed Cable,3m	
1.6	PCIe Expansion	Should supports up to 4 × dual-width or 14 × single-width GPU cards	
1.7	GPU Support	Data: 4 × 1GbE, Management: 1 × 1GbE.	
1.8	Cooling	- 4 × hot-swappable counter-rotating fans with N+1 redundancy - Power Supply - 2 x Hot-swappable 2000W Platinum PSUs with 1+1 redundancy - 2 x Power Cords Cable, AC 250V10A,1.8m,C14-C13 PDU Cable"	
1.9	Installation Accessories	- 1 x Ball Bearing Rail Kit - 1 x 2U Bezel/Panel"	
1.10	Server Management:	Integrated iBMC with dedicated management port supporting Redfish, SNMP, IPMI 2.0, HTML5/VNC KVM, Agentless monitoring, remote control Supported OS: Microsoft Windows Server, VMware ESXi, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Ubuntu, Debian, CentOS, Oracle Linux, openEuler	
1.11	Warranty	- 3-Year Warranty Onsite Standard - 24x7 Technical Assistance Center (TAC) Support - Online Self-help Support - System Software Updates - 9x5xNBD Advance Hardware Replacement - 9x5xNBD Onsite Support	
1.12	Management	Web-based GUI, serial port CLI	
1.13	Power Supply	Redundant 550W power supplies	
1.14	Warranty	1 Year	

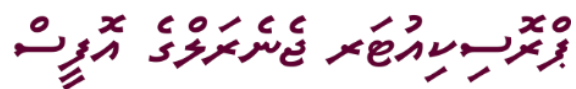
2. Storage Expansion - 1 Bundle

#	Minimum Specification	✓
2.1	08 Nos x HPE MSA 2.4TB SAS 12G Enterprise 10K SFF (2.5in) M2, with 3-Year Warranty 03 Nos x HPE MSA 14TB 7.2K (3.5in) M2, with 3-Year Warranty 01 Nos x 1-Year HPE TechCare Essential Services Renewal for HPE MSA2060	

3. Professional Services: Installation, Configuration, and Integration Service - 1 Bundle

#	Minimum Specification	✓
3.1	Team requirement - The vendor MUST have the following Certified Professional/Engineer under its payroll to provide the required professional services. All relevant engineer(s) certificates and supporting documents shall be included with the proposal. Required certificates of the engineer(s): - IT Project Management or IT Service Management - Fortinet Certified Professional Network Security - HPE Accredited Technical Professional Storage Solution - HPE SimpliVity System Administration - Veeam Certified Engineer (VMCE) - Cisco CCN Certified	
3.2	Service Planning and Design - Assess the existing compute cluster, HPE Storage, Cisco core network, and Fortinet security infrastructure. - Prepare a detailed deployment and integration plan, including network design, VLAN allocation, IP addressing, storage allocation, and security considerations. - Design the compute node expansion architecture to ensure compatibility with the existing virtualization and storage environment. - Plan the storage expansion for the HPE MSA 2060, including disk group expansion, RAID considerations, and capacity utilization.	
3.3	Service Deployment - Supply and install the required server compute node hardware in the designated rack location. - Install the HPE MSA 2.4TB SAS 12G Enterprise HDDs into the existing HPE MSA 2060 storage array. - Perform physical installation of power cables, network cables, and storage connectivity cables. - Update firmware, BIOS, and system software to the latest stable versions supported by the existing environment. - Configure the server hardware, RAID settings, management interfaces, and network interfaces as per the approved design.	
3.4	Integration Services with Existing - Add the new compute node(s) to the existing cluster. - Configure cluster membership, resource pooling, and high-	

	Compute Cluster	availability settings. - Verify compatibility with the existing virtualization environment	
3.5	Integration Services with Existing HPE Storage	- Expand the existing HPE MSA 2060 storage capacity using the supplied HDDs. - Configure storage pools, virtual disks, and LUNs as required. - Ensure proper RAID configuration and storage performance optimization. - Verify storage availability and accessibility from the existing server and virtualization environment.	
3.6	Integration Services with Existing Cisco Core Network	- Configure network connectivity for the new compute node(s), including VLAN assignment and port configuration. - Configure network connectivity as required for high-speed data communication. - Verify network redundancy, connectivity, and throughput. - Ensure integration with existing Cisco core network policies and standards.	
3.7	Integration Services with Existing Fortinet Security	- Ensure that the new compute and storage components comply with existing Fortinet security policies. - Configure required firewall rules, access control policies, and network segmentation. - Validate secure communication between compute nodes, storage systems, and management interfaces. - Ensure that management interfaces are protected and accessible only to authorized administrators.	
3.8	Cooling	- 4 x hot-swappable counter-rotating fans with N+1 redundancy - Power Supply - 2 x Hot-swappable 2000W Platinum PSUs with 1+1 redundancy - 2 x Power Cords Cable, AC 250V10A,1.8m,C14-C13 PDU Cable"	
3.9	Testing and Commissioning	- Verify successful installation and configuration of all hardware components. - Test compute node integration with existing cluster. - Test storage expansion, LUN accessibility, and performance. - Verify network connectivity and security policy enforcement. - Conduct failover, redundancy, and functionality testing.	
3.10	Documentation and Knowledge Transfer	- Provide detailed as-built documentation covering server configuration, storage configuration, network settings, and security integration. - Provide updated network and storage architecture diagrams. - Provide warranty and support information. - Conduct knowledge transfer sessions for PGO ICT personnel covering system administration, monitoring, troubleshooting, and support procedures.	



وَجَاءَ قَوْمًا مُّسِيءِينَ

مجموعہ ص ۵۵۵ سے ۵۵۷

درجہ دوم سرسبز:

د جديتو سره مخامخ شو:

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ 1

1. $\frac{1}{x^2} = x^{-2}$

وَأَمَّا نَسْوَا فَمِنْ تَحْتِهَا نَاقُوسٌ مُنَادٍ يَدْعُو إِلَى الصَّلَاةِ وَالْإِذْقَارِ عَلَى الْعِشَاءِ فَسَقَا

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۞ خُذْ زِينَتَكَ ۖ كُلَّمَا خُذْتَ يُذَكِّرُكَ لِقَاءَ رَبِّكَ ۖ
 ۞ خُذْ زِينَتَكَ ۚ كُلَّمَا خُذْتَ يُذَكِّرُكَ لِقَاءَ رَبِّكَ ۚ

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.....: رَدُّ الْوَعْدِ

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وَمِنْ ذَٰلِكَ نَعْلَمُ مَا يُعْلِمُونَ

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تَرَدُّدُ مَرْمَرٍ تَرَدُّدُ مَرْمَرٍ تَرَدُّدُ مَرْمَرٍ تَرَدُّدُ مَرْمَرٍ تَرَدُّدُ مَرْمَرٍ

حج

سورة

3- اِنَّ زُرَّارًا مِّنْهُمْ يَخْشَوْنَ رَبَّهُم بِالْغَيْبِ اِذْ هُمْ لَا يَشْعُرُونَ:

..... رِسْرَسْ سَوْدِي قُوْعُج دُرْتَرْمِي

..... دَسَمَ لَوِیْزُ زَبَرَزَّ ذُو قَرْصٍ: (مَسْرُورٌ قُرُوسٌ رَدْسَرِسُ)

..... : دسویں صدی کے (میں نے)

