1. DR solution Hyper converged Infrastructure Solution

6.1 Bill Of Materials

SL No.	Item Description	Qty
1.0	**Rack Server Server** 2 X Intel Xeon Gold 6248 2.5G, 20C/40T, 10.4GT/s, 27.5M Cache, Turbo, HT (150W) DDR4-2933 256 GB (8 x 32GB RDIMM, 2666MT/s, Dual Rank) 2 x 240GB or more SSD SATA with hardware RAID 1 2 x 800GB SSD SAS Mixed use 3 DWPD or Higher 8 x 2.4 TB 10K SAS 2.5" 4 x 10Gb DA/SFP+, + 2 x 1Gb Ethernet Pass-through Raid controller Power Supply Dual, Hot-plug, Redundant Power Supply 5Year 24x7 Next Business Day Onsite Service	3
2.0	VMware Cloud Foundation 4 Standard (Per CPU) Cloud Foundation Standard includes vSphere Enterprise Plus, vSAN Advanced, NSX Data Center Advanced, and SDDC Manager for vSAN	6
3.0	Production Support/Subscription for VMware Cloud Foundation 4 Standard (Per CPU) for 5 years	6
4.0	VMware vCenter Server 6 Standard (Per Instance)	1
5.0	24x7 Production Support/Subscription for VMware Vcenter Standard for 5 years from VMware OEM	1
8.0	24 Port 10G SFP+ switch, 2 x 100G Uplinks with 5 Year 24x7 Next Business Day Onsite Service	2
9.0	24 Port Base-t Gigabit with 5 Year support	
10.0	Enterprise Storage with 5 Year 24x7 Next Business Day Onsite Service	1
11.0	DR Solution from existing DC to new DR site	1
12.0	Backup solution with 5 year support	1
13.0	Implementation Charges for Virtualization & Management	1

2. Annexure 5 - Format for technical Compliance

2.1 Compute (Make/Brand - HP/Dell) Qty:- 3 nos.

Sl No:	Parameter	Description	Compliance Yes/No
1	Processor	Intel Xeon Gold 6248 2.5G, 20C/40T, 10.4GT/s, 27.5M Cache, Turbo, HT (150W) DDR4-2933	
2	No of Processors	2 socket fully populated	
3	Chipset	Intel Chipset/ OEM Chipset	
4	Memory Scalability	Minimum 24 DIMM slots DDR4 or higher	
5	Memory	256 GB Registered DDR-4 ECC Memory populated upgradable to 3 TB	

6	Storage	2 x 200 GB SATA SSD/above 2.5" with hardware RAID 1, 2x800 GB SAS SSD Mixed Use 3 DWPD 2.5", 8 x 2.4 TB 10k SAS	
7	Drive Bays	16 x 2.5" SAS/SATA or better	
8	RAID Controller	12Gb/s SAS Raid Controller with Pass through Support	
9	Optical Drive	DVD – RW Drive	
10	NIC	10Gb –SFP+ ports – 4 no:s	
11	Additional Network Interface / HBA connectivity	Dual Port 16 Gbps Fibre Channel Expansion Cards or better. + Transceivers which Support auto negotiation to 8Gbps	
12	I/O Expansion	Minimum 4 PCIe 3.0 expandable up to 6 slots	
13	Ports	4 USB (2 front side and 2 rear side)	
14	Remote Management	Remote Management card with Dedicated Management/ Network Interface should support IPv4, IPv6, VLAN Tagging. Should be support remote boot, OS deployment and shutdown	
15	Rack Mount Kit	Sliding Rail that should support form factor	
16	Power Supply & Cooling system	Hot swappable redundant Power Supply and Fan	
17	Failure alert	The server should be able to alert impending failures on maximum number of components. The alerting mechanism should at least include Processor, memory, Power Supply, FAN and Hard Disk Drives	
18	Operating System Compatibility	Server support latest versions of Microsoft Hyper-V, VMWare VSphere, RedHat Enterprise Linux, SUSE Linux Enterprise Server, Microsoft Windows Server 2008 onwards, x86/x64	
19	Manageability Software	Server Manageability software as per manufacturing standard of OEM for monitoring and Managing the server.	
20	Warranty	5 year comprehensive onsite warranty with NBD on site directly from OEM, Pre-failure warranty on CPU, Memory and Hard Disks	
21	Preferred Brands	HP,Dell	

2.2 HCI Switch (Make/Brand - HP/Dell) Qty:-2 nos.

Sl No:	Category	Tender Specifications	Complied (Yes/No)

2	Hardware	Switch should be 19'' rack mountable and Maximum a of 1 RU in size.	
		Switch should have Redundancy Power Supply Units (PSUs) from day one, Hot-swappable, field-replaceable power supplies, 1:1 power redundancy.	
		Switch should have 24 port 10G SFP+ Ports from day one	
		Switch should be populated with 16no:s of 10G SFP+ multimode transceivers, 3 x 1G SFP single mode, 5 x 10G SFP+ Single mode Transceiver Module from day one	
		Switch should have dedicated 2 no:s of QSFP28 (100Gbp/s) interfaces from day one . Switch should configure in High Availability mode using VLT/VPC/Stacking using 2x40G Ports.	
3	Performance	Must have Layer 2 hardware forwarding at 880 gbps when fully populated with all the scalability considerations	
		Must have Line-rate traffic throughput on all ports at Layer 2	
		Must have Line-rate traffic throughput on all ports at Layer 3	
4	Scalability	Must support minimum 63,000 MAC address table entries.	
		Must support at least 2200 IPV4 Unicast route entries	
		Must support at least 7000 IPV4 Multicast route entries	
5	Datacenter Networking Features	The switch should support feature like VXLAN/NVGRE/QinQ or similar Layer 2 Gateway features that connects the hypervisor based ovelray networks with nonvirtualized infrastructure	
		The switch should support features to support VM Migrations/Mobility across DC within the same Layer 2 VLAN domains or across multiple DC.	
		The switch should support feature like VRF-lite to enables sharing of networking infrastructure and provides Layer 3 traffic isolation across tenants.	
		The switch should support DCB with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support	
6	Networking Features	Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit, 40 Gigabit	
		Should support L3 routing in hardware for both IPv4 and IPv6 packets	
		Should support 8K route table capacity for IPv4/IPv6.	
		Should support Static Route, RIP, OSPF, ISIS, BGP from Day one for both IPv4 and IPv6 considering all License, software, hardware upgrades required if any.	
		IEEE 802.3, IEEE 802.3u, IEEE 802.3z, IEEE 802.1D, IEEE 802.1Q, IEEE 802.3ab, IEEE 802.1p, IEEE 802.3x, IEEE 802.3ad (LACP), IEEE 802.1w, IEEE 802.1x, IEEE 802.1s, 802.3ae 10 Gigabit Ethernet, 802.3ba 40Gigabit Ethernet, 802.1p L2 Prioritization, 802.1Q VLAN Tagging, Double VLAN Tagging (Q in Q), GVRP, 802.1D Bridging, GARP, GMRP, 802.3x Flow Control, 802.1ac	

		Frame Extension for VLAN tagging, 802.1x Port based Network Access Control	
		Should support 802.1Q VLAN Tagging/ QinQ VLAN Tagging/ GVRP etc	
		Should support technologies similar to MLAG, ECMP, Stacking etc	
7	Security Features	Should support all AAA functions with RADIUS and TACACS integration.	
		Should support Intrusion Protection like functionality against various TCP/UDP attacks.	
8	Management Features	Must provide management using 10/100/1000-Mbps management or console ports	
		Must have CLI-based console to provide detailed out-of-band management	
		Must support Unified username and passwords across CLI and SNMP	
9	Regulatory Standards Compliance	The Switch support comply with Safety certifications such as UL 60950-1 & IEC 60950-1	
		The Switch should comply with RoHS	
10	Warranty & Support	OEM warranty for 5 year 24x7 Next Business Day	
11	General Terms	Should produce Manufacturer Authorization Form from OEM.	
12	Preferred Brands	HP,Dell	

2.3 Management Switch (Make/Brand - Dell / HP) Qty: -1 nos.

SL NO.	FUNCTIONALITY	COMPLIANCE (YES/NO)
	GENERAL	
1	The Switch Should have Minimum 24 Port 10/100/1000 Mbps Base-T and 2 x 1/10G SFP/SFP+ ports along with required 2 numbers of 1G Multimode SFP modules	
2	The Switch should support non-blocking architecture with minimum switching capacity of 88 Gbps	
3	The switch should Layer 2 switching between VLAN's. IPv4 routing should support up to 512 static routes and up to 128 IP interfaces. Switch should support Standard 802.1d Spanning Tree support, Fast convergence using 802.1w (Rapid Spanning Tree [RSTP])	
4	Switch should support minimum 200 VLANs simultaneously, Port- based and 802.1Q tag-based VLANs, MAC-based VLAN, Management VLAN	
5	The switch should support layer 2 features & IPV6 features	
6	The Switch should support RADIUS authentication where switch functions as client.	
7	OEM warranty for 5 years with NBD support from day1.	
8	The Switch should support Access Control List features	

9	The offered switch should have Built-in switch configuration utility of ready browser-based device configuration (HTTP/HTTPS).	
10	Preferred Make - HP,Dell	

2.4 Enterprise Storage (Make/Brand - Dell / HP) Qty: -1 nos.

Sl No:	Tender Specifications	Complied(Yes/No)
1	Storage system shall support Both Block and File Protocols. It must have dual redundant controllers in active-active mode with automatic fail over to each other in case of failure. File services should not require any extra hardware and must be built in the processor.	
2	10TB of usable capacity using SSD drives (RAID 5 with 1 hot spare) and 25 TB of usable capacity using 10K or more RPM SAS disk drives with RAID 5 (RAID 5 with 1 hot spare) and 40 TB NLSAS drives with Raid 6 (Raid 6 with 1 hot spare). Required feature license if any to enable data tiering across SSD, SAS and NL-SAS tiers must be provided from day one.	
3	Storage array shall be configured in No-Single-Point-of-Failure configuration with redundant components and offer Five 9's of availability.	
4	The Storage array shall have end to end 12 Gbps SAS architecture for Backend and Disk connectivity.	
5	The array should support block protocols like FC, iSCSI and File protocols like CIFS, NFS and SMB.	
6	The storage array must support scalability upto 2 PB	
7	The storage array must support scalability of up to minimum 480 drives storage array and it should allow adding SSD/SAS/NLSAS disks.	
8	Array should be supplied with at least 128 GB Cache which should be flexibly usable for Read and write operations. All writes must me mirrored across controllers. Array should have capability to extend the system cache by adding high performance solid state disks. This cache should be able to accelerate both read and write IOs.	
9	The array should be supplied with 4 x 4 lane 12Gb/s SAS ports across storage controllers for back-end connectivity.	
10	The array must keep write cache persistent during fault conditions.	
11	The array should be supplied 8 X 16G FC ports and 8 X 10G Ethernet Ports SFP+ ports across controllers, Ethernet ports shall support both Block (iSCSI) and File (NFS, CIFS) protocols simultaneously. Array must be capable of upgrading more FC, iSCSI, Eth ports online in future.	
12	The Storage should have the capability to provide Quality of Service (QoS) for the LUNs/volumes configured in the system to ascertain desired performance level for applications.	
13	The Storage array must provide end-to-end data protection using industry standard mechanism such as parity checking, checksum and background disk scrubbing etc.	
14	The Storage array must provide multiple levels of access control including role-based security and auditing capability.	
15	The storage array should support connectivity to current version of OS Platforms like Linux, Windows, VMware etc.	
16	The storage array must be configured with required licenses to enable thin provisioning to allow physical allocation of just the storage that is needed or over provisioning of capacity. This license should be configured for entire supported capacity of the array.	
17	In the event of unplanned power failure, data in the cache should be safely destaged to the disks to protect data from loss.	

18	The storage system should support non-disruptive field replacement capabilities for components like Disk Drives, Disk connections, power supplies, controllers etc.	
19	The Storage array should support continuous system monitoring, advanced remote diagnostics and proactive hot sparing to enhance system robustness, availability and reliability.	
20	Entire storage capacity should be protected with Data-at-rest encryption, Encryption should be provided either on controller level or should be configured with Self Encrypting drives.	
21	The Storage array should be upgraded to higher model with Data-in-place protection in the offered array family to meet future data growth and lower TCO.	
22	The storage should be configured with easy to manage, simple integrated user interface for distributed storage environments. A single sign-on centralized console should have dashboards for at-a-glance management and reporting and other functions like configuration monitor and manage. Performance monitoring should be provided to analyze the performance data.	
23	Storage shall be configured with required feature license to snapshot and restore file and block data. The. This license should be configured for entire supported capacity of the array.	
24	Preferred Make - HP,Dell	

2.5 DR Solution

2.6 Backup Software Solution for 5 years (Make/Brand - Veeam/ Commvault/Veritas)

Sl No:	Tender Specifications	Complied (Yes/No)
1	The proposed Backup software must offer host based / CPU based/ VM based licensing with no restrictions on type of arrays (protecting heterogenous storage technologies), front end production capacity or backend backup target capacity for virtual or physical servers. Licenses and associated hardware should be supplied for both primary and DR site. with Academy licenses. Backup software should have license to take backup for min 25 VMs from day one or 14 sockets.	
2	Licenses supplied should have support for Backup.	
3	Backup software should be an image level backup software supporting popular hypervisors like VMware and Hyper-V Virtual Environments. Provide Block level Incremental and Differential Backup and support Incremental and Differential Imaging.	
4	Backup and replication software must deliver maximum investment protection by supporting replication of workloads between dis-similar systems like hyperconverged infrastructure to stand alone servers and storage running similar hypervisors across sites	
5	The proposed backup software should provide recovery from physical servers to Virtual and image level recovery.	
6	Backup software should support file level recovery from an image level backup of Windows\Linux guest file systems.	
7	Backup software should provide best RTOs and RPOs through booting of Virtual Machines directly from the Backup to reduce the downtime.	
8	Backup software should have integrated data de-duplication engine with multi-vendor storage support to save space by storing de-duplicated copies of data. The de-duplication engine should also facilitate IP base replication of de-dupe data. All necessary hardware and software required to support this functionlaity should be supplied along with other components	
9	Backup software should provide Recovery of Application Items,Complete VM recovery capabilities from the image level backup .	
10	Recovery verification should automatically boot the server from backup and verify the recoverability of VM image, Guest OS and Application Consistency.	

11	Backup software should provide Backup capabilities in one console only and also allow users to integrate with capabilities of the hypervisor, so that users can initiate backup and restore only those VMs to which they have access, without administrator intervention, thereby delivering self serve capabilities.	
12	The software should support varieties of backup mechanisms like Full, Incremental, and Differential etc. at different frequencies i.e. yearly, monthly, weekly, daily, hourly etc. as per defined policy. It should also have calendar-based backup scheduling. The restoration should also be supported accordingly.	
13	Replication in the software should be a VM level replication and must replicate the VM level data with or without backing it up at the source site. It should also include failover and failback capabilities and should be able to perform automatic acquisition of network addresses at the destination site.	
14	Proposed solution should support 24x7 real-time monitoring, with at-a-glance and drill-down views of health, performance and workload of the virtual hosts.	
15	Proposed solution should support automated action for popular alarms (automated or semi-automated), with at-aglance and drill-down views of health, performance and workload of the virtual hosts.	
16	The proposed Backup software must Support Seamless Integration with Point-in-time storage snapshots with Major OEM SAN Storages in the environment to perform faster LAN Free backup without any overhead to Hypervisor Compute Layer, allowing recovery at the application level, the file level, and the VM level.	
17	Backup software should have ability to backup data from one server platform and restore it to another server platform to eliminate dependence on a particular machine and for disaster recovery purposes.	
18	Direct OEM 24x7 support with unlimited incident support for 5 years, The OEM for the proposed backup software must be in leaders quadrant" Gartner's report of "Magic Quadrant " for Datacentre Backup and Recovery solution	
19	Preferred Make: Veeam/Commvault/Veritas	