RFP: Supply, Installation and Commissioning of Hardware and Software for CSE

Annexure #2

Server, Storage, Software & Network Equipment

Item#	Server Storage Rack	Qty/LOT
		DC Site
1.1	Server Type 1	26 Units
1.2	Server Type 2	3 Units
1.3	SAN Storage Type 1	4 Units
1.4	SAN Switch Type 1	8 Units
1.5	SAN Storage Type 2	1Unit
1.6	SAN Switch Type 2	1Unit
1.7	RACK with KVM, Console and PDU	4 Units
1.8	Disk Based Appliance	1 Unit
	System Software	
2.1	Red Hat	1 LOT
2.2	Microsoft	1 LOT
2.3	VMware	1 LOT
2.4	VEEAM Backup Solution	1 LOT
	Network Equipment	
3.1	Datacenter Cut-through Switch	11 Units
3.2	1GbE Switch	8 Units
3.3	10GBASE-T Copper Module	12 Units
3.4	10GBASE-SR SFP Module	40 Units
3.5	Active Twinax Cable	20 Units
3.6	1000BASE-T SFP Module	20 Units
3.7	Optical Cable	1 LOT
3.8	Patched Cable (CAT6)	1 LOT

1.1 Server Type 1				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Make	Bidders to specify		
2	Model	Bidders to specify		
3	Processor	2 x Intel Xeon-Gold 5th Generation Processor 6544Y, Base Frequency 3.60 GHz, 16 Cores, Threads 32, 45 MB Cache **is preferred.** But bidder may quote at least 2x Intel Xeon-Gold 5th Generation Processor 6542Y, configured with Frequency 3.00 GHz, 16 Cores through Intel® SST-PP Config: 6542Y (2) available from day 1.		
4	Chipset	Intel C741 Chipset or higher.		
5	Memory	Server should support 16 DIMMS slots Per Processor (Minimum 32 DIMMS in Total), Shall be provided with Minimum 512 GB dual-rank DDR5, 4800 MT/s.		
6	Disk Drive Bay / HDD size	Shall be provided with minimum 2x 600GB SAS 10k 2.5-inch hot-pluggable HDD, Expansion Slot: Bidder should mention available expansion slots..		
7	Boot Optimized Storage	Minimum 2 x 480GB NVMe M.2 SSD or SAS SSD with dedicated HW RAID1 controller.		
8	RAID Controllers	RAID Controller with minimum RAID 0,1,5,10 support with 4GB Cache or higher		
9	Ethernet	4 x 1 Gigabit Ethernet ports 2 x 2-port 10G SFP+ (with required 10G SFP+ to SFP+ 5 meter DAC cable)		
10	HBA	At least 2 x 2-port 32 Gbps FC HBA. 64 Gbps FC HBA is preferred.		
11	Slots	Minimum 2 PCIe Gen5 slots from day1		
12	Interface	Minimum: 1 Graphic, 1 x USB 2.0, 3 x USB 3.0 Ports or higher		
13	Power Supply	Server should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified		
14	FAN	Server should have redundant fully populated Hot swap fans		
15	Form Factor	2U Rack Mountable Server with Rail Kit, Cable Management, and Bezel Kit.		
16	OS Support	Windows Server 2022 Datacenter & Standard		
		VMware vSphere Hypervisor (ESXi) 8.0U2 or higher		
		Red Hat Enterprise Linux (RHEL) 7.9		
		Red Hat Enterprise Linux (RHEL) 8 or Higher		
		Community Enterprise Linux (CentOS, Alma Linux, Rocky Linux)		
		Citrix Hypervisor 8.2 or higher		
		Canonical Ubuntu 20.04.5 LTS & 22.04 LTS or higher		
17	Security	TPM 2.0, Cryptographically signed firmware, Hardware root of trust, Secure Boot, System Lockdown, System Erase		
18	Remote Management capabilities	It shall be possible to manage the server hardware and software components remotely.		
		It shall be possible to power on/off and boot the system remotely, management log.		
		Dedicated 1Gbps remote management port		

		Bidder should mention integration support with popular platform management software.		
19	Server Management Software	The Systems Management software should provide Role-based security. Should provide Pre-failure warning for – • CPU • Memory • HDD.		
20	Server Power Supply	Adequate hot plug redundant AC Power supplies		

1.2 Server Type 2

SL	Item or Related Service	Technical Specification and Standards	Bidder's Response	Reference Document Name and Page No
1	Make	Bidders to specify		
2	Model	Bidders to specify		
3	Processor	1 x Intel Xeon-Gold 5th Generation Processor 6544Y, Base Frequency 3.60 GHz, 16 Cores, Threads 32, 45 MB Cache **is preferred.** But bidder may quote at least 1x Intel Xeon-Gold 5th Generation Processor 6542Y, configured with Frequency 3.00 GHz, 16 Cores through Intel® SST-PP Config: 6542Y (2) available from day 1.		
4	Chipset	Intel C741 Chipset or higher.		
5	Memory	Server should support 16 DIMMS slots Per Processor (Minimum 32 DIMMS in Total), Shall be provided with Minimum 256 GB dual-rank DDR5, 4800 MT/s.		
6	Disk Drive Bay / HDD size	Shall be provided with minimum 2x 600GB SAS 10k 2.5-inch hot-pluggable HDD, Expansion Slot: Bidder should mention available expansion slots.		
7	Boot Optimized Storage	Minimum 2 x 480GB NVMe M.2 SSD or SAS SSD with dedicated HW RAID1 controller.		
8	RAID Controllers	RAID Controller with minimum RAID 0,1,5,10 support with 4GB Cache or higher		
9	Ethernet	4 x 1 Gigabit Ethernet ports 2 x 2-port 10G SFP+ (with required 10G SFP+ to SFP+ 5 meter DAC cable)		
10	HBA	At least 2 x 2-port 32 Gbps FC HBA. 64 Gbps FC HBA is preferred.		
11	Slots	Minimum 2 PCIe Gen5 slots from day1		
12	Interface	Minimum: 1 Graphic, 1 x USB 2.0, 3 x USB 3.0 Ports or higher		
13	Power Supply	Server should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified		
14	FAN	Server should have redundant fully populated Hot swap fans		
15	Form Factor	2U Rack Mountable Server with Rail Kit, Cable Management, and Bezel Kit.		
16	OS Support	Windows Server 2022 Datacenter & Standard		
		VMware vSphere Hypervisor (ESXi) 8.0U2 or higher		
		Red Hat Enterprise Linux (RHEL) 7.9		
		Red Hat Enterprise Linux (RHEL) 8 or Higher		
		Community Enterprise Linux (CentOS, Alma Linux, Rocky Linux)		
		Citrix Hypervisor 8.2 or higher		
		Canonical Ubuntu 20.04.5 LTS & 22.04 LTS or higher		
17	Security	TPM 2.0, Cryptographically signed firmware, Hardware root of trust, Secure Boot, System Lockdown, System Erase		

18	Remote Management capabilities	It shall be possible to manage the server hardware and software components remotely.		
		It shall be possible to power on/off and boot the system remotely, management log.		
		Dedicated 1Gbps remote management port		
		Bidder should mention integration support with popular platform management softwares.		
19	Server Management Software	The Systems Management software should provide Role-based security. Should provide Pre-failure warning for – • CPU • Memory • HDD.		
20	Server Power Supply	Adequate hot plug redundant AC Power supplies		

1.3 SAN Storage Type 1				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Brand	To be mentioned by the bidder		
2	Model	To be mentioned by the bidder		
3	Country of Origin	To be mentioned by the bidder		
4	Data Storage Type	Proposed Array should be Enterprise Grade- All-NVMe Storage model.		
5	Data Availability and All Flash	1. Offered storage shall be an array which can provide at least enterprise class resiliency & Six 9's data availability guaranteed architecture along with all NVMe controllers. 2. At least Six 9's data availability guaranty shall be clearly mentioned on vendor web site for the offered model. 3. Offered storage array shall have capability for supporting front-end connectivity with NVMe over fabric using standard fiber channel switches of 16, 32 Gbps or optional upgradable to 64Gbps.		
6	Operating System & Clustering Support	1. The storage array should support industry-leading Operating System platforms & clustering including: Windows Server 2019 / 2022, VMware ESXi 7/8, and Linux etc. 2. Must support SCSI Primary Commands version 3 (SPC-3) with fence_scsi & fence_mpath. Must be compatible with RHEL High Availability Clusters.		

7	Capacity & Scalability	1. Offered Storage array shall support all NVMe protocol enabled SSD inside the storage array and shall be scalable to at-least 21 NVMe drives within the controller enclosure. 2. Offered storage shall be scalable to more than 300TB raw physical capacity using 15.36TB NVMe drives without adding any additional controller. 3. Offered storage array shall be future scalable to 300TB raw capacity without adding any additional controller. 4. Offered Storage array shall be supplied minimum with **35TB** usable (**70TB** Effective capacity considering deduplication and compression only) Capacity using minimum 14x3.84TB self-encrypted drives (TLC/MLC) and shall be configured in RAID6. 5. Offered storage shall deliver minimum 60,000 Mixed IOPS at 70:30 read/write ration at 8k random IO Block keeping the data reduction feature enabled.		
8	Storage Encryption	1. Vendor shall offer only the encrypted drives with appropriate encryption licenses and meet FIPS 140-2 – Level 2 security or similar requirements. Vendor shall not offer any controller based or Software based encryption. 2. Offered encrypted drives shall support KMIP key management solutions. Vendor shall offer at-least internal Key manager engine for key management.		
9	No. of Controllers	Offered Storage array shall be offered with at-least dual controllers.		
10	Memory and CPU Processing Power	1. Offered Storage array should have at-least 512GB memory across both controllers. 2. Offered storage controller shall be based upon at-least PCI 4.0 technology and offered storage shall be offered with at-least 16 number of CPU cores. 3. offered array should have a capability of Write-Through cache and does not require write cache mirroring. 4. Offered storage shall be based upon latest generation Intel or AMD or ARM CPUs		
11	Architecture & Processing Power	1. Offered storage array shall be true Active-Active so that every logical disk is striped across all offered drives and all drives shall be able to contribute the IOs to both controllers simultaneously. 2. Offered storage array shall have native virtualization support so that RAID can be carved out from a logical space instead of dedicating separate physical disks for each application.		
12	No Single point of Failure	Offered Storage Array shall be configured in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.		
13	Site Assessment (Optional)	1. Vendor shall do comprehensive Cloud based assessment, at-least for VMware environment on a quarterly basis and shall factor the required services for it. 2. Assessment shall provide the detailed analysis of VMware Hosts – CPU & Memory utilization, Storage analysis and relevant findings of contention, Culprit and Victim VMs in the environment attached to offered storage. Offered assessment shall do complete analysis of licensing as well.		

14	Host Ports and Back-end Ports	1. Offered Storage array shall have minimum of 4 x 32 Gbps Fiber Channel ports & 4x 25Gbps SFP28 ports with transceivers. 2. Offered Storage may be upgradable to 64 Gbps Fiber Channel with transceiver in future (Optional). 3. Offered storage shall support both Fiber Channel (FCP) as well as NVMeOF over Fiber channel. 4. PCI 4.0 slot of the Fiber channel card shall have at-least 16 lanes so that each offered port can work at line speed. 5. Each offered controller shall have minimum of 40 PCI 4.0 lanes for NVMe disk connectivity. 6. For maximizing the overall performance and NVMe SSD endurance, offered storage array shall support full RAID stripe write to backend disk drives for eliminating the white space issues of NVMe SSD drives. Vendor shall provide the documentary proof for same. 7. Offered Storage array system shall be provided with minimum 2 x 10/25Gbps ethernet ports for storage-based replication.		
15	Global Hot Spare	1.Offered Storage Array shall support distributed Global hot Spare for offered Disk drives. 2. Global hot spare shall be configured as per industry practice.		
16	Quality of service	1. Offered storage array shall support quality of service for critical applications so that appropriate and required response time can be defined for application logical units at storage. It shall be possible to define different service / response time for different application logical units. 2. Quality of service engine shall allow to define minimum and maximum cap for required IOPS / bandwidth for a given logical units of application running at storage array. 3. It shall be possible to change the quality-of-service Response time (In both milliseconds or Sub-milliseconds), IOPS, bandwidth specification at real time.		
17	Capacity efficiency	1. Offered storage array shall support inline data efficiency engine (Supporting Thin Zero detect and re-claim, De-duplication and Compression) and shall be enabled by default. 2. Vendor shall have flexibility to enable / disable the data efficiency engine at the time of Volume creation. 3. Storage subsystem shall be supplied with Thin Provisioning, Thin Re- claim, Snapshot, remote replication, De-duplication, Compression, Performance Monitoring, and Quality of service on day 1 for the supplied capacity of the array.		
18	Firmware Upgrade	Offered storage shall support online non-disruptive firmware upgrade for both Controller and disk drives without any reboot of controller.		

19	Integration - Container	Offered Storage array shall be integrated with Red-hat OpenShift, Kubernetes and other industry K8 based container platform through CSI driver set. Vendor shall support at-least following functionalities through their CSI / CSP integration: a. Shall support both Static and Dynamic provisioning b. Shall be able to expand, re-size the persistent volumes given to stateful set applications. c. Shall be able to create and delete the snapshots. d. Shall support CSI Raw block volume as well as CSI Volume cloning. e. Support for both Fiber channel as well as iSCSI.		
20	Snapshot / Point in time copy & No. of Volumes	1. The storage array should have support for controller-based snapshots (At-least 1024 copies for a given volume). 2. Offered Storage array shall support more than 14000 base volume on the storage array without snapshot and clone.		
21	Remote Replication	1. The storage array should support hardware-based data replication at the array controller level across all models of the offered family. 2. Offered Storage array shall support both Synchronous and Asynchronous replication across 2 storage arrays natively without using any third party or software-based solution. 3. Offered storage array shall have capability to create the application consistency group for replication operations. Shall have flexibility to have more than 256 volumes per consistency group. 4. Offered storage subsystem shall support incremental replication after resumption from Link Failure situation or during failback operations.		
22	Active / Active Stretch Clustering	1. Offered Storage array shall have capability to provide true Active / Active Replication with I/O optimization for local clusters deployments through Fiber configured from day 1. 2. Offered Storage array shall have capability to provide true Active / Active Replication for Stretch clustering at metro distances for Zero RPO and RTO so that a given volume pair between primary and DR location can have concurrent access to both read and write operations simultaneously. 3. Active / Active replication must be supported for all well-known Hypervisors like VMware, Hyper-v, KVM, XEN etc.		
23	Multi-tenancy	Offered storage array shall be true multi-tenant and shall support at-least 128 Tenant per storage array. Every tenant shall be treated as a separate logical storage array with its own user control access.		
24	Installation services, manage & control	Implementation shall be done by OEM Engineer only. OEM remote/onsite installation and startup service should be provided. Offered storage system shall be configured with Active-Active Replication and VMware Metro Storage Cluster across 2 (Two) storage in day1 as per CSE's Requirement. OEM Professional service must be quoted.		

25	Warranty & services	3-Year's collaborative warranty with 24x7 mission critical one-point support from OEM. 4-hour mission critical response time for hardware issue from OEM. Supporting service-related document shall be provided. All above features BoQ should be provided with proper explanation.		
26	Knowledge based Transfer	Supplier will arrange a training and certificate examination on OEM's Storage Administration for minimum 3 days for 5 persons at OEM's certified training and training center. All necessary cost will be borne by the supplier.		
27	Local Warehouse/Part Depot	OEM must maintain local spare parts depot/warehouse in Bangladesh. OEM Authorized letter must be submitted.		

1.4 SAN Switch Type 1				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Brand	Same as Storage OEM.		
2	Model	To be mentioned.		
3	Country of Origin	To be mentioned.		
4	Country of Manufacturing	To be mentioned.		
5	Form Factor	Please specify rack unit.		
6	Number of ports	Each switch should be configured with 24 ports in a single domain concurrently active at Minimum 32Gb/sec with no over subscription from day1.		
7	Scalability	Scalability up to Fifty-Six (56) Ports		
8	Auto-sensing	Should protect existing device investments with minimum auto-sensing 16, 32 Gbit/sec capabilities. Upgradability to 64Gbit/sec is optional.		
9	Port Type	The switch shall have universal ports so that port can self-configure as E, D, F and EX Port respectively.		
10	Quality of Service (QoS)	Switch shall have support for Adaptive Networking services such as Quality of Service (QoS) to help optimize application performance in consolidated, virtual environments. It should be possible to define high, medium and low priority QOS zones to expedite high priority traffic.		
11	Firmware Upgrades	The switch should have USB port for firmware download, support save, and configuration upload/download.		

12	Software License	Offered SAN switch shall support Fabric Performance Impact monitoring, Slow Drain Device Quarantine, port & WWN based zoning, broadcast zoning, peer zoning & target-driven zoning, Dynamic Path Selection, Extended Fabrics, Enhanced BB Credit Recovery, FDMI, Frame Redirection, Frame-based Trunking, FSPF, Integrated Routing, NPIV, Registered State Change Notification, Reliable Commit Service, Simple Name Server and virtual fabric services. Switch shall be configured with all required licenses for supporting above services.		
13	Redundant Components	Should mention redundant and hot pluggable components.		
14	Manageability	Switch shall have support for web-based management and should also support CLI		
15	Software	To be mentioned the features of all the software in details		
16	Latency & Bandwidth	Offered switch port to port latency shall not be more than 780 ns using cut through frame switching. Aggregated device Bandwidth: minimum **2**Tbps.		
17	Port Activation	Minimum Twenty-Four (24) ports should be activated from day one.		
18	FC Cable	Minimum 24 x LC/LC Multi-mode OM4 15m Fiber Cable		
19	Short wave kit	All offered activated FC ports shall be populated with 32Gbps SFPs. Optional upgrade facilities to line speed of 64Gbps per ports by replacing the SFPs.		
20	Power Supplies	Offered SAN switches shall be highly efficient in power consumption with redundant power supply.		
21	Warranty	3 years 24x7x365 comprehensive OEM warranty with mission critical 4-hour response time, faulty parts replacement with labor. Every component of proposed solution must be supplied from the same OEM. Warranty support SKU with the detail BoQ should be provided with the technical compliance document.		

1.5 SAN Storage Type 2				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Make	To be mentioned by the bidder		
2	Model	Bidders to specify with origin.		
3	Operating System & Clustering Support	1. The storage array should support industry-leading Operating System platforms including: Windows 2016 / 2019 / 2022, VMware, C and Linux. 2. Must support SCSI Primary Commands version 3 (SPC-3) with fence_scsi & fence_mpath. Must be compatible with RHEL High Availability Clusters.		
4	Capacity & Scalability	1. Offered Storage array shall be supplied minimum with 7TB usable after raid 5/6. Should consider only SAS SSD Drives for storage. 2. Storage shall be scalable to minimum of 240 number of SAS SFF drives.		

5	Front-end Ports & Back-end Ports	1. Offered Storage system shall be supplied with minimum 4 x 16Gbps FC ports per controller drives. 2. Offered storage system shall support 12G SAS Back-end connectivity.		
6	Architecture	The storage array should support dual, redundant, hot-pluggable, active-active array controllers for high performance and reliability		
7	No Single point of Failure	Offered Storage Array shall be configurable in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.		
8	Cache	1. Offered Storage Array shall be given with Minimum of 12GB cache per controller in a single unit. 2. Cache shall be backed up in case of power failure for indefinite time either using batteries or capacitors or any other equivalent technology. 3. Offered Storage shall also have optional support for Flash cache using SSD / Flash drives. Offered storage shall support at-least 8TB Flash Cache and shall be configured with at-least dual 1.92GB SSD drives for Flash Cache.		
9	Raid Support	Offered Storage Subsystem shall support Raid 1 , 5 , 6 or Raid 1 , 5 , 10 and 6		
10	Point in time and clone copy	1. Offered Storage array shall be configured with array based Snapshot and clone functionality and shall be configured for minimum of 500 snapshot licenses. 2. Offered Storage array shall support at-least 500 point in time copies (Snapshots) and 120 volume / Clone copies		
11	Replication	1. Offered storage subsystem shall support storage-based replication to DR location. License for maximum supported capacity of the array shall be offered. 2. Offered storage subsystem shall support replication to multiple storage array of the same family in fan-out mode. At least 1:4 mode shall be supported.		
12	Data Tiering	Offered Storage shall also be configured for Sub-Lun Data tiering in real time fashion across different type of drives within a given pool like SSD, SAS, NL-SAS etc. License shall be configured for maximum supported capacity of the array.		
13	Load Balancing & Muti-path	Multi-path and load balancing software shall be provided, if vendor does not support MPIO functionality of Operating system.		
14	Array Integration	Offered storage array shall have plug-in for VMware VCenter, Microsoft System center as well as vStorage APIs (VAAI) for array integration.		

1.6 SAN Switch Type 2				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Brand	Same as storage vendor.		
2	Model	To be mentioned by the bidder		
3	Country of origin	To be mentioned by the bidder		
4	Manufacturing Country	To be mentioned by the bidder		
5	Rack Form Factor	1U/2U Rack form factor with rail kit.		
6	Number of ports	Each switch Shall be provided with min. 08x 32Gbps SFP+ connections with transceivers.		

7	Port activation	Shall be provided with min. 08 (Eight) activated port with Necessary Cables & accessories.		
8	Switch Aggregated bandwidth & Latency	Shall have 768Gbps end-to-end full duplex & latency less then <780 nanoseconds		
9	Software	To be mentioned by the bidder		
10	SAN Orchestration	Should have tightly integration with the proposed storage system.		
11	FC Cables	Each switch shall be provided with min. 16x 15m LC–LC Multi-mode OM4 Fiber Cable shall be provided		
12	Manageability	Should be provided with web browser management tools		

1.7 Rack with KVM, Console and PDU					
SL	**Item or Related Service**		**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Rack & PDU	Brand	To be mentioned by the bidder.		
		Model	To be mentioned by the bidder.		
		RACK Type	42U 600mmx1075mm G2 Kitted Advanced Pallet Rack with Side Panels and Baying		
		PDU	4x Basic 7.3kVA/60309 3-wire 32A/230V Outlets (32) C13 (6) C19 Vertical PDU		
2	Enterprise IP KVM Switch	Brand	Same as server brand		
		Model	To be mentioned by the bidder.		
		Interface Adapter	2 (Two) x KVM Console USB 8-pack Interface Adapter		
		KVM Console Switch	1x2x16 G4 KVM IP Console Switch		
3	KVM Console	Brand	Same as server brand		
		Offered LCD Console Features	18.5-inch WXGA TFT LCD display that support most common video resolutions from 800 x 600 through 1600 x 1200 at 60 to 75 Hz refresh rates.		
		Model	To be mentioned by the bidder.		

1.8 Disk Based Appliance				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
1	Brand	Same as the Server brand.		
2	Model	To be mentioned by bidder.		
3	Country of origin	To be mentioned by the bidder		
4	Country of Manufacture	To be mentioned by the bidder.		
5	Country of assemble	To be mentioned by the bidder.		
6	Form Factor	2U Rack Mountable necessary with Rail Kit, Cable Management, and Bezel Kit etc.		
7	Architecture	Offered Disk to disk backup device shall be Modular design to allow configuration, add capacity increase performance.		
8	Compatibility	Offered appliance shall be compatible to work with at-least 3 Backup application vendor ISV like HPE, Veritas, Dell-EMC, Veeam, Commvault etc.		
9	Capacity	Offered device shall be offered with Minimum of 50TB Useable space after RAID6 scalable to at-least 170TB usable space by using not more than 8TB drives.		
10	Scalability	Offered device shall also be scalable to at-least 170TB usable in native mode (Without de-duplication and compression).		
11	Integration	Vendor shall not use any additional staging device in-between while moving the data from Disk based backup device to public cloud or object storage		

12	Boot drives	Offered device shall have separate dedicated drives for Operating System of appliance and shall not participate in data backup		
13	RAID	Offered device shall be protected with hardware raid 5/6 from the factory so that no raid configuration is required in field		
14	Protocol supported	Offered device shall support emulation of NAS target like CIFS. VTL emulation is optional.		
15	Fibre channel Host port	Should be provided with 2x dual-port 25G SFP28 adapter with transceivers and 2x dual port 32Gbps FC host port for SAN based backup.		
16	Cloud integration	Offered device shall have capability to do complete copy of data sets from on premise disk backup storage to Cloud storage instead of data tiering.		
17	Licensing	Offered device shall have integrated de-duplication license, low bandwidth replication license so that only unique non duplicated block transfers to remote / DR location.		
18	Deduplication	Offered device shall have intelligence to understand both source based and target based de-duplication and shall be integrated with all well-known backup ISVs like Veritas, Commvault and Veeam etc. At-least 3 ISVs shall be supported.		
19	Remote backup	Offered device shall support receiving non duplicated data from remote locations or branch office directly from the application servers / Client servers in low bandwidth mode without using any backup or replication-based device at remote location / Branch office.		
20	Performance & Throughput	The proposed device shall support rated write performance of minimum 10 TB per hour and when enabled with source level de-deduplication, shall have rated performance of at least 25 TB/hr		
21	Storage integrated backup	Offered appliance shall leverage snapshot performance with storage-integrated backups to provide up to flash speed data protection and copy data management with less cost and less complexity than legacy solutions.		
22	Installation services, manage & control	1. The Storage Management Software should be of the same brand as of the server supplier. 2. Connect devices to OEM for real-time diagnosis, alerts, and information. 3. OEM professional installation and start-up service should be provided.		

System Software

2.1 Red Hat:

OS	Details	Quantity
Red Hat 8.6 Enterprise Linux Server subscription	RHEL x86 64bit 1 YR Premium Support Subscription	51
Red Hat 7.9 Enterprise Linux Server subscription	RHEL x86 64bit 1 YR Premium Support Subscription	9

2.2 Microsoft:

OS	Details	Quantity
Windows Server 2022 Datacenter	Microsoft Windows Server 2022 Datacenter 16-core perpetual license	4
Windows Server 2022 Standard	Windows 2022 Standard 16-Core perpetual license	1

2.3 VMware:

OS	Details	Quantity (No. of Cores)
VMware vSphere Standard	Bidder must provide VMware vSphere Standard licenses for total 880 Cores with original software manufacturing support services for 1 year.	880

2.4 Veeam Backup Solution (DC+DR):

SL	Details	Quantity
Brand	VEEAM	50 (Fifty) instances perpetual license with 1 Year maintenance support

Network Equipment

3.1 Datacenter Cut-through Switch				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	Quality	ISO 9001/9002 for manufacturer for quality assurance		
2	Brand	To be mentioned by the bidder		
3	Model	To be mentioned by the bidder		
4	Country of Origin	To be mentioned by bidder		
5	Country of Manufacture	To be mentioned by the bidder		
6	Quantity			

7	Environmental	Maintain International Quality Environmental Safety standard		
8	Enclosure Type	Rack mountable maximum 1 RU		
9	Industry Certifications and Evaluations	The proposed solution must be positioned as a Leader in the Wired and Wireless LAN Access Infrastructure segment of the Gartner Magic Quadrant for the last 2 years.		
10	Part No	Bidder should submit BOQ of the proposed device including the details' part number. The bidder should submit the required performance document for the proposed device.		
11	Switch Architecture	Should be highly performed fixed switch with wire rate Layer 2 and Layer 3 throughput on all the ports on the chassis.		
		Should have minimum of 24x 10GE SFP+ based ports, Scalable to 48 port 10GE SFP/SFP+ transceiver-based ports if required.		
12		Dual redundant power source and redundant Fans		
13	Switching Performance	Switching capacity min 470 Gbps		
14		Forwarding Throughput min 350 Mpps		
15	Switch Layer 2 Services	Layer 2 switch ports and VLAN trunks		
		IEEE 802.1Q VLAN encapsulation		
		Support for up to 4000VLANs		
		IEEE 802.1w		
		IEEE 802.1s: minimum 60 instances		
		Spanning Tree Port Fast		
		Spanning Tree Root Guard		
		Spanning Tree Bridge Assurance or equivalent technology		
		Up to 16 ports per Ether Channel or equivalent technology		
		LACP: IEEE 802.3ad, IEEE 802.1ax		
		Advanced Port Channel hashing based on Layer 2, 3, and 4 information or equivalent technology		
		Jumbo frames on all ports (up to 9216 bytes)		
		Storm control (multicast and broadcast)		
		Link-level f low control (IEEE 802.3x)		
16	Switch Layer 3 Services	Layer 3 interfaces: Routed ports on interfaces, switch virtual interfaces (SVIs), Port Channels, and sub interfaces (total:1024)		
		Minimum 20 way Equal-Cost Multipath feature for load balance		
		Minimum 4000 ACL entries		
		Routing protocols: Static, RIPv2, OSPF, VRRP		
		ACL: Routed ACL with Layer 3 and 4 options to match ingress and egress ACLs		
		Jumbo frame support (up to 9216 bytes)		
17	Security features	Ingress ACLs (standard and extended) on Ethernet		
		Standard and extended Layer 3 to 4 ACLs include IPv4, Internet Control Message Protocol (ICMP), TCP, and User Datagram Protocol (UDP)		
		VLAN-based ACLs (VACLs)		
		Port-based ACLs (PACLs)		

		Named ACLs		
		ACLs on virtual terminals (VTYs)		
		Dynamic Host Configuration Protocol (DHCP) relay		
		Control Plane Policing		
18	Management features	CLI-based console to provide detailed out-of-band management; Bidder has to provide minimum base license from day one.		
		In-band switch management		
		Switch management using 10/100/1000-Mbps management or console ports		
		SSHv2 and Telnet		
		SNMP agent - SNMPv1, SNMPv2, SNMPv3.		
		Integrated Packet analyzer.		
		Bidder should propose all the necessary hardware, software & license and the entire solution should be offered from single OEM		
19	Manufacturer Authorization	Bidder must submit Manufacturer Authorization from the OEM		
20	Manufacturer's part number	Bidder should submit BOQ of proposed device including the details' part numbers and Manufacturer Warranty		
		Bidder should submit the required performance document for the proposed device. If the additional accessories are essential, Bidder will provide by this additional accessory according to the proposed model		
21	Installation, Testing and Commissioning	Bidder must carry out on site installation, testing and commissioning. In consultation with IT Department, bidder must configure appropriate security and administration related policies, must do integration with other related hardware/software required to make the Network functional and shall provide respective documentation to IT Department		
22	Warranty & Support Services	Manufacturer's warranty part number should be mentioned, minimum 3 (three) years warranty for OEM technical solution support. Patch & New Software Upgrade, RMA replacement should be provided for this unit from the date of commissioning. Manufacturer should have local office & Local Depo in Bangladesh		

3.2 1GbE Switch				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	Quality	ISO 9001/9002 for manufacturer for quality assurance		
2	Brand	To be mentioned by the bidder		
3	Model	To be mentioned by the bidder		
4	Country of Origin	To be mentioned by the bidder		
5	Country of Manufacture	To be mentioned by the bidder		
6	Quantity			
7	Environmental	Maintain International Quality Environmental Safety standard		
8	Enclosure Type	Rack mountable maximum 1 RU		
9	Industry Certifications and Evaluations	The proposed solution must be positioned as a Leader in the Wired and Wireless LAN Access Infrastructure segment of the Gartner Magic Quadrant for the last two years.		
10	Part No	Bidder should submit BOQ of the proposed device including the details' part number. The bidder should submit the required performance document for the proposed device.		
11	General Features	Should have minimum 24 x 1 GE and 4 SFP+ uplink ports from Day one		
		Flash memory: Minimum 256MB		
		DRAM: Minimum 512MB		
12	Performance	Switching capacity - minimum Up to 128 Gbps		
		Forwarding Bandwidth: 64 Gbps		
		Forwarding rate: 95 Mpps		
		Number of MAC addresses: Minimum 16,000		
		Number of STP instances: 64 Preferred or bidder should mention number of STP instances supported		
		Number of SPAN sessions: Minimum 4 or bidder should mention number of session supported		
13	Management	Bidder should mention out of Band Ports for Management.		
		Support Event Manager for customizable event correlation and policy actions during failure/error threshold exceed		
		Should support Telnet and SSH		
		Bidder should propose all the necessary hardware, software & license and the entire solution should be offered from single OEM		
14	Manufacturer Authorization	Bidder must submit Manufacturer Authorization from the OEM		
15	Manufacturer's part number	Bidder should submit BOQ of proposed device including the details part numbers and Manufacturer Warranty		

16		Bidder should submit the required performance document for the proposed device. If the additional accessories are essential, Bidder will provide by this additional accessory according to the proposed model		
	Installation, Testing and Commissioning	Bidder must carry out on site installation, testing and commissioning. In consultation with IT Department, bidder must configure appropriate security and administration related policies, must do integration with other related hardware/software required to make the Network functional and shall provide respective documentation to IT Department		
17	Warranty & Support Services	Manufacturer's warranty part number should be mentioned, minimum 3 (three) years warranty for OEM technical solution support. Patch & New Software Upgrade, RMA replacement should be provided for this unit from the date of commissioning. Manufacturer should have local office & Local Depo in Bangladesh		

3.3 10GBASE-T Copper Module				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	Quality	ISO 9001/9002 for manufacturer for quality assurance		
2	Brand	To be mentioned by the bidder		
3	Model	To be mentioned by the bidder		
4	Country of Origin	To be mentioned by the bidder		
5	Country of Manufacture	To be mentioned by the bidder		
6	Quantity	12 (Twelve) Units		
7	Environmental	Maintain International Quality Environmental Safety Standard		
8	Part No	Bidder Must submit BOQ of proposed device including the details part numbers. The bidder should submit the required performance document for the proposed device.		
9	Product Description	IEEE 802.3an, 802.3ab, 802.3u Standard Supported		
		Data rates should be supported by the module: 100M/1G/10Gbps from Day 1		
		Should support copper cabling of link lengths up to 30 meters with 10Gbps speed		
10	Originality	Bidder should propose OEM original SFP Module		
		The transceiver must be of the same brand as per the proposed network devices		
11	Manufacturer Authorization	Bidder must submit Manufacturer Authorization from the OEM		

3.4 10GBASE-SR SFP Module				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	Quality	ISO 9001/9002 for manufacturer for quality assurance		
2	Brand	To be mentioned by the bidder		
3	Model	To be mentioned by the bidder		
4	Country of Origin	To be mentioned by the bidder		
5	Country of Manufacture	To be mentioned by the bidder		
6	Quantity	40 (Forty) Units		
7	Environmental	Maintain International Quality Environmental Safety Standard		
8	Part No	Bidder Must submit BOQ of proposed device including the details part numbers. The bidder should submit the required performance document for the proposed device.		
9	Product Description	IEEE 802.3ae 10GBASE Multimode standard		
		Multimode fiber links up to 300 meters		
10	Originality	Bidder should propose OEM original SFP Module		
		The transceiver must be of the same brand as per the proposed network devices		
11	Manufacturer Authorization	Bidder must submit Manufacturer Authorization from the OEM		

3.5 Active Twinax Cable				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	Quality	ISO 9001/9002 for manufacturer for quality assurance		
2	Brand	To be mentioned by the bidder		
3	Model	To be mentioned by the bidder		
4	Country of Origin	To be mentioned by the bidder		
5	Country of Manufacture	To be mentioned by the bidder		
6	Quantity	20 (Twenty) Units		
7	Environmental	Maintain International Quality Environmental Safety Standard		
8	Part No	Bidder Must submit BOQ of proposed device including the details part numbers. The bidder should submit the required performance document for the proposed device.		

9	Product Description	Direct-attach twinax copper cable assembly with SFP+ connectors		
		Active Twinax Cable with 7m Length from Day 1		
10	Originality	Bidder should propose OEM original modules with cable		
		The transceiver must be of the same brand as per the proposed network devices		
11	Manufacturer Authorization	Bidder must submit Manufacturer Authorization from the OEM		

3.6 1000BASE-T SFP Module				
SL	**Item or Related Service**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	Quality	ISO 9001/9002 for manufacturer for quality assurance		
2	Brand	To be mentioned by the bidder		
3	Model	To be mentioned by the bidder		
4	Country of Origin	To be mentioned by the bidder		
5	Country of Manufacture	To be mentioned by the bidder		
6	Quantity	20 (Twenty) Units		
7	Environmental	Maintain International Quality Environmental Safety Standard		
8	Part No	Bidder Must submit BOQ of proposed device including the details part numbers. The bidder should submit the required performance document for the proposed device.		
9	Product Description	IEEE 802.3z 1000BASE Copper standard		
		1000BASE-T SFP modules support 10/100/1000 auto negotiation and Auto MDI/MDIX		
		Should support copper cabling of link lengths up to 100 meters		
10	Originality	Bidder should propose OEM original SFP Module		
		The transceiver must be of the same brand as per the proposed network devices		
11	Manufacturer Authorization	Bidder must submit Manufacturer Authorization from the OEM		

3.7 Optical Cable				
SL	**Qty**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	10-qty	LC/LC Multi-mode OM4 2 Fiber 15m Cable		
2	20-qty	LC/LC Multi-mode OM4 2 Fiber 5m Cable		
3	20-qty	LC/LC Multi-mode OM4 2 Fiber 3m Cable		
4	20-qty	LC/LC Multi-mode OM4 2 Fiber 2m Cable		

3.8 Patched Cable (CAT6)				
SL	**Qty**	**Technical Specification and Standards**	**Bidder's Response**	**Reference Document Name and Page No**
	1	**2**	**3**	**4**
1	15-qty	Patched Cable (CAT6A or higher)-1 meter		
2	25-qty	Patched Cable (CAT6A or higher)-2 meter		
3	35-qty	Patched Cable (CAT6A or higher)-3 meter		
4	20-qty	Patched Cable (CAT6A or higher)-5 meter		
5	15-qty	Patched Cable (CAT6A or higher)-15 meter		