

WEBEL TECHNOLOGY LIMITED

CORRIGENDUM –I

TENDER NO WTL/WB-CCW/SG/23-24/044 dated 20.12.2023

Sl No	Section No	Clause No	Page No	Existing Clause Description	Clarification/ Revised Clause
01	A	8	5	Payment shall be made back-to-back basis (payment will be made only on receipt of payment from relevant customer) only and after submission of documentary evidence of having functional service centre	Payment Terms: 70% against delivery of Hardware Components, 20% against installation, Commissioning and Training (by OEM) & 10% against final acceptance by the user Department.
02	A	13	5	The successful bidder / OEM shall have to provide 5 years on-site Comprehensive Warranty during the entire warranty period as per contract. The comprehensive warranty / support maintenance / trouble shooting shall be covering under the scope of work. For attending any calls and setting any malfunction, a down time of more than 48 hours shall not be allowed and time taken beyond this permissible down time of 48 hours or 2 days shall be liable for a penalty as per the penalty clause.	The successful bidder / OEM shall have to provide 5 years on-site Comprehensive Warranty during the entire warranty period as per contract. The comprehensive warranty / support maintenance / trouble shooting shall be covering under the scope of work. For attending any calls and setting any malfunction, a down time of more than 2 (Two) hours shall not be allowed and time taken beyond this permissible down time of 2 (Two) hours shall be liable for a penalty as per the penalty clause.
03	B	2	6	The bidder should have their presence in Kolkata with own office for minimum period of five continuous years. Valid proof should be submitted along with the bid.	The bidder should have their presence in Kolkata with own office for minimum period of three continuous years. Valid proof should be submitted along with the bid.
04	B	7	6	The bidder should have an average annual turnover of not less than Rs.30 Crore each year in the last three financial years (considering FY – 2020-21, 2021-22, 2022-	The bidder should have an average annual turnover of not less than Rs.14 Crore each year in the last three financial years (considering FY – 2020-21, 2021-22, 2022-23. Bidder shall have to submit Audited Balance

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				23. Bidder shall have to submit Audited Balance Sheet/Audited Accounts/Auditor Certificate in support of their claim.	Sheet/Audited Accounts/Auditor Certificate in support of their claim.
05	D	20	12	Payment terms will be on back to back basis,i.e. , payment will be made only on receipt of payment from relevant customer,i.e. WB-CCW	Payment Terms: 70% against delivery of Hardware Components, 20% against installation, Commissioning and Training (by OEM) & 10% against final acceptance by the user Department.
06	D	34	14	The bidder should have a call centre working from at least 09:00 hrs. to 21:00 hrs. in Kolkata. The contact details of the call centre must be furnished along with the bid. Any call logged with the service centre must be given a running docket number to the person reporting the call. The average uptime averaged over each quarter should be as follows: Uptime requirement – 99.0% Maximum Downtime permitted in Qtr 48 Hrs	The bidder/OEM should have a call center working for 24x7 in Kolkata. The contact details of the call center must be furnished along with the bid. Any call logged with the service center must be given a running docket number to the person reporting the call. The average uptime averaged over each quarter should be as follows: Uptime requirement – 99.5% Maximum Downtime permitted in Qtr 2 Hrs
07	D	60	18	Location Details : WB-CCW, Rajarhat, Kolkata	Location Details : Smart Connect Building, Diplomatic Enclave, AA-11, New Town , Kolkata 700161
08	H	14	25	Not mentioned	Line item to be added to Bill of Material – Sl No : 14 Item Description : Charges for Installation, Commissioning, Testing and Training (by OEM) Qty: LS
09	I		32	Minimum Specification of Software (Sl No 3 & 4)	Revised as under (Section I)

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SECTION- I (Modified)

Minimum Specification of Blade Server (Sl No 1 of BOM)

Qty.	04 No.
Make	
Model	
Part No	

Sl.No	Minimum Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	CPU	Dual 4th Gen 32-core @ minimum 2.1GHz processor(s).		
2	Memory			
		Minimum 512GB RAM using minimum 32GB DDR5 or higher DIMM(s). Offered Server shall be scalable up to 8TB RAM.		
		Advanced ECC to detect and correct single and all multibit error that occurs within a single DRAM chip		
		Online Spare should be supported.		
		Fast Fault Tolerance or equivalent.		
3	HDD/SSD/NVMe	2 x 480GB NVMe SSD using HW-RAID1 as Boot Controller.		
		Support for up to 4 hot-swap NVMe/SAS/SATA SSD drives		
4	Video	Integrated Graphics controller		
5	Network Controller	Dual ported 50Gb Converged network Adaptor (OR 2 x Dual-ported 25G Eth plus 2 x Dual-ported 16G FC). Solution to be provided to enable partitioning up to minimum 16 separated physical functions including 1 x FC, 1 x iSCSI and multiple Ethernet ports.		
6	FC HBA	Should be capable of supporting 32 Gbps Dual port Fiber Channel HBA internal to the Server Blade.		

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7	Bus Slots	Minimum of 3 Nos of x16 PCIe 5.0 based mezzanine slots supporting Converged Ethernet, Ethernet, and FC adapters.		
8	Ports	1 * external USB 3.0. Dedicated 1Gb Ethernet for OOB (OS independent) management.		
9	OS Certification	Certification for latest Server version of Windows and Linux including Oracle Linux.		
10	Virtualization	Should support Industry Standard Virtualization Software		
11	Driver/Software Utilities	All required device drivers for OS installation /System Configuration and Server Management		
12	System Management & Security	Remote management of Server over LAN & WAN with SSL encryption through OOB gigabit management port, Remote KVM, Server Health Logging, Virtual NIC, REST API, IEEE 802.1x & IEEE 802.1AR, Forensics capture of defective FW images to NAND/USB for external analysis, HTML5 Remote Console, TPM module, Encrypted Virtual Media, and virtual folder with required advanced IPMI license, AD or LDAP, Config backup, Syslog (local and remote). UEFI Secure Boot and Secure Start, Security feature to ensure servers do not execute compromised firmware code, digitally signed, and verified updates, Security Dashboard for Server to detect possible security vulnerabilities, CNSA compliance, Precision Time Protocol (IEEE 1588 PTP)		
		Management software should support integration with popular virtualization platform management software like vCenter, SCVMM, and Red Hat Virtualization.		
		Offered Server platform must be ready for container workload deployment		
		The Server Management Software should be of perpetual type and of the same brand as of the server OEM.		
		Server OOB shall have dedicated management memory with ECC protection.		

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		Ability up to six users to share remote console to troubleshoot, maintain and administer remote servers.		
		Group management of power control, and power capping, firmware, configuration, virtual media, and licensing.		
13	Serviceability	System should support embedded remote support to transmit hardware events support. The server should support monitoring and recording changes in the server hardware and system configuration. It assists in diagnosing problems and delivering rapid resolution when system failures occur. Should provide remote firmware update functionality.		
		Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory, and HDD		
		System should support embedded remote support to transmit hardware events directly to OEM or an authorized partner for automated phone home support		
		Solution should be included for monitoring & analysis feature to predict, prevent and auto-resolve problems and by providing automating case creation with OEM TAC and log file submission to OEM TAC for the problems that can't be auto-resolved.		
		Solution provided should help in automatic support case creation with OEM.		
		System should provide firmware upgrade and patch upgrade recommendations proactively.		
		One-button or one-click or RESTful API based secure erase of all user data on the server with respect to secondary storage and NVRAM compliant to NIST 800 standards.		
14	IDC ranking	OEM should be ranked within top 3 as per IDC report for any one of the previous four quarter in India for server.		
15	Warranty	Five years on-site comprehensive OEM Warranty Support with 24x7 coverage and access to OEM TAC/support.		

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Minimum Specification of Blade Chassis (Sl No 2 of BOM)

Qty.	01 No.
Make	
Model	

Sl.No		Minimum Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Solution Requirement	Solution included with required quantities of blade chassis to be offered to accommodate 10nos of blade servers. Required cables, connectors, fabric interconnect modules/switches in redundancy as needed as per OEM product architecture to be included in the offered solution.		
		Proposed solution should support provisioning virtual, physical and container infrastructure from pools of compute, storage, and networking resources		
		Solution should have single console provisioning for compute, storage and server-side network configuration with choice of direct attach storage (DAS), iSCSI and FC SAN should be available		
		Solution should support API to integrate into popular management tools such as Microsoft Systems Center, VMWare vCenter and into open-source automation for DevOps tools such as Chef, Docker and OpenStack.		
		Solution should support software defined templates to quickly make changes to the infrastructure. Template should include server BIOS, firmware, boot order, RAID, storage configs and network configs of the infrastructure required for workload.		
		Blade chassis solution should support Internal and external storage provisioning: Local/zoned direct attached storage (DAS), software-defined storage (SDS) and storage area networks (SAN). Should support SAN storage management compatibility for switched fabric, direct attached, or vSAN		

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		topologies.		
		Blade chassis solution should support Boot-from-SAN for Fibre Channel (FC), Fibre Channel over Ethernet (FCoE), and iSCSI storage		
		Blade Chassis solution should offer collaborative user interface which support logical resources to physical resources mapping, Smart Search, Activity Log, HTML5 mobile access, and Customizable Dashboard		
		Blade chassis solution should support compute blades based on all the recent generation Intel Xeon processors such as 2 nd , 3 rd and 4 th Gen Processors from day 1.		
		Blade chassis should support Storage Module as a directed attached storage module with 40 SFF Drives, Chassis should support min 4nos of Storage Module.		
2	Form Factor & Technology	Offered blade chassis shall be from the latest generation from the Server OEM.		
		Offered Blade chassis should provide connectivity of the shared resources (network modules, management networks etc.) to the compute blades and offered blade chassis architecture should have no-single-point-of-failure design.		
		Dedicated Redundant hot-plug management network connection modules in the chassis for complete management of all the active modules in the chassis		
		Management software for the maximum config with perpetual license. The management software should be from the same OEM.		
		Dedicated Redundant management modules/servers providing single management point for server, storage and networking for both single chassis & multi-chassis environment.		
		Offered blade chassis shall have minimum six I/O module slots to support 3+3 redundancy.		
		Blade chassis should provide display port and USB port to connect Laptop/Monitor		

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		locally		
		Shall have integrated/external KVM solution		
3	System Panel	LEDs or LCDs on the chassis can be used to obtain the status of the chassis connection and health.		
4	Reporting	Should support reporting capabilities for: (a) asset and inventory information for the devices in the enclosures, (b) thermal and power information, including real-time actual power usage per server and per enclosure. Reports should be exportable to csv or Microsoft Excel format		
5	I/O Module	Redundant hot-plug I/O modules- (or Fabric Interconnect switches in redundancy) shall be provided such that uplinks from the chassis can be directly uplinked to LAN & SAN switches		
		Offered I/O solution in the blade chassis should support 50Gbps downlink to the Server Blades in redundancy supporting carving of each port into at least eight ports/network functions. Minimum 100G (200G in full-duplex/bi-directional) bandwidth to be offered to each blade server.		
		Should support to choose Ethernet and FC uplinks as needed		
		Should support MLAG/equivalent for resiliency against interconnect failure		
		Server to Server communication should be in 1:1 non-blocking		
		Each I/O module (or fabric interconnect switch) should have minimum support for 8 x 32Gbps active external FC links, 8 x 25Gbps active SFP28 links, and 2 x 100Gbps QSFP28 links. Offered solution shall be complete in respect of such optics/connectors/cables.		
		Required cables/connectors/mounting-kits shall be included. Minimum cable length required: 15 meters for all patch cords.		
6	Power & Cooling	Blade chassis should be populated fully with power supplies of the highest capacity available with the vendor. Power supplies should support N+N as well as N+1 redundancy configuration, where N is greater than 1. Should offer a single-phase power subsystem enabled with technologies		

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		for lower power consumption and offering Platinum energy efficiency.		
		Blade chassis should have a cooling subsystem consisting of redundant hot pluggable fans or blowers enabled with technologies for improved power consumption and acoustics.		
7	Driver/Software Utilities	All required device drivers for OS installation /System Configuration and Server Management		
8	System Management & Security	Remote management of Server over LAN & WAN with SSL encryption through OOB gigabit management port, Remote KVM, Server Health Logging, Virtual NIC, REST API, IEEE 802.1x & IEEE 802.1AR, Forensics capture of defective FW images to NAND/USB for external analysis, HTML5 Remote Console, TPM module, Encrypted Virtual Media, and virtual folder with required advanced IPMI license, AD or LDAP, Config backup, Syslog (local and remote). UEFI Secure Boot and Secure Start, Security feature to ensure servers do not execute compromised firmware code, digitally signed, and verified updates, Security Dashboard for Server to detect possible security vulnerabilities, CNSA(RFC8603) compliance		
		Blade chassis Management Software should be of the same brand as of the server OEM.		
		Management software should support integration with popular virtualization platform management software like vCenter, SCVMM, and Red Hat RHEV.		
9	Serviceability	System should support embedded remote support to transmit hardware events support. The server should support monitoring and recording changes in the server hardware and system configuration. It assists in diagnosing problems and delivering rapid resolution when system failures occur. Should provide remote firmware update functionality.		
		System should support embedded remote support to transmit hardware events directly to OEM or an authorized partner for		

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		automated phone home support		
		System should provide firmware upgrade and patch upgrade recommendations proactively.		
		The system should help in automatic support case creation with OEM.		
		Offered solution should be provided for monitoring & analysis feature to predict, prevent and auto-resolve problems and by providing automating case creation with OEM TAC & log file submission for the problems that can't be auto-resolved to OEM TAC		
		System should support RESTful API integration		
10	IDC ranking	OEM should be ranked within top 3 as per IDC report for any one of the previous four quarter in India for server.		
11	Warranty	Five years on-site comprehensive OEM Warranty Support with 24x7 coverage and access to OEM TAC/support		

Minimum Specification of Software (SI No 3 to 6 of BOM)

Qty.	8 No.
Make	
Model	
Part No.	

SI.No	Minimum Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Windows License	Windows Server 2022 Data Centre 16-Core Lic	
2		Windows Server 2022 Data Centre 16-Core Addon Lic	

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Qty.	1 No.
Make	
Model	
Part No.	

SI.No	Minimum Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	VM Ware License	v Centre Standard with 5 Years Support		

Qty.	8 No.
Make	
Model	
Part No.	

SI.No	Minimum Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	VM Ware License	VMWare vSphere Enterprise Plus 5 Years Support		

Minimum Specification of Storage (SI No 7 of BOM)

Qty.	01 No.
Make	
Model	
Part No.	

SI.No	Minimum Specification		Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
	Paramater	Functionality		

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1	Data Availability and All Flash	<p>1. Offered storage shall be an array which can provide enterprise class resiliency & 100% data availability guaranteed architecture along with all NVMe controllers.</p> <p>2. 100% data availability guaranty shall be clearly mentioned on vendor web site for the offered model. If vendors are not supporting the 100% data availability as per their web site then vendor shall quote additional Controller and 10% additional capacity as cold spare along with array for mitigating the failure situations.</p>		
2	Operating System & Clustering Support	<p>The storage array should support industry-leading Operating System platforms & clustering including: Windows Server 2019 / 2022, VMware ESXi 7/8, Linux and HP-UX etc.</p>		
3	Memory and CPU Processing Power	<p>1. Offered Storage array should have at-least 512GB memory across both controllers.</p> <p>2. After a complete power failure, the host acknowledged writes must be restored without the need for battery backed mirrored write caches.</p> <p>3. Offered storage controller shall be based upon at-least PCI 4.0 technology and storage shall be offered with at-least 32 number of CPU cores.</p>		
4	Capacity & Scalability	<p>1. Offered storage shall be scalable to more than 1PB raw physical capacity using 15.36TB NVMe drives.</p> <p>2. Offered Storage array shall be supplied minimum 100TB usable Capacity using encrypted drives and shall be configured in Raid 6. Vendor shall not use more than 10D+2P while sizing the array</p> <p>3. Offered Storage shall be able to protect against at-least 2 drives failure simultaneously within a given raid group.</p>		

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5	Disk Enclosures	<p>1. Vendor shall ensure that all additional drive enclosures required within the given solution or achieving 1PB raw capacity shall be directly connected to offered controllers using dedicated 100Gbps NVMe-OF redundant links.</p> <p>2. Vendor shall also ensure that each additional drive enclosure shall have dual node or dual controller where each node or controller shall have dedicated CPU and at least 128GB of memory.</p> <p>3. If vendor doesn't support 128GB memory at each controller of drive enclosure, then vendor shall supply additional 512GB memory across main storage controllers.</p>		
6	Storage Encryption	<p>1. Vendor shall offer only the encrypted drives with appropriate encryption licenses. Vendor shall not offer any controller based or Software based encryption.</p> <p>2. Offered encrypted drives shall support both KMIP 1.3 and KMIP 1.4 for key management solutions. Vendor shall offer at-least internal Key manager engine for key management.</p>		
7	No. of Controllers	Offered Storage array shall be offered with at-least dual controllers.		
8	Architecture & Processing Power	<p>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.</p> <p>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.</p>		
9	No Single point of Failure	Offered Storage Array shall be configured in a No Single Point of failure configuration including Array Controller card, Cache memory, FAN, Power supply etc.		

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10	Cloud Native data console Management	<p>a. Common Dashboard for all managing multiple arrays through a single cloud native data console.</p> <p>b. Main Dashboard shall provide the information of Total number of Arrays, Volumes, hosts, Capacity and performance information of top Arrays and Volumes.</p> <p>c. Common role-based access control for managing multiple arrays through a single data console instead of creating users and assigning roles individually at each array.</p> <p>d. Common Audit management for all arrays</p> <p>e. Shall have capability for tagging the Storage volume to given host applications so that performance charts can be drawn for application instance for easy management and troubleshooting.</p> <p>f. Offered console shall advise about Placement of application on best fit system based on workload after application tagging.</p> <p>g. Shall be able to provide the context aware software updates on the storage array.</p> <p>h. Shall be able to offer storage management and configuration as a service instead of controlling, patching, and upgrading the management application by onsite team.</p>		
11	Cloud Enabled - Monitoring and Analytics	<p>Cloud Enabled Monitoring and analytics engine shall have capability to provide following:</p> <p>a. Providing Firmware update path, previous version, readiness check before applying the update to production environment and severity level for required firmware update.</p> <p>b. Dashboard shall clearly highlight whether there is any issue with array and shall provide the detailed information about the issue.</p> <p>c. Providing granular near real time performance analysis, at-least at an</p>		

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		<p>interval of 5 minutes. It shall allow to create custom reports in csv and PDF format without the need for enabling extra logging, installing any appliances (physical or virtual), or installing any software.</p> <p>d. Providing overall headroom utilization of the array while combining and analyzing various parameters like IOPS, MB/sec, Block size etc.</p> <p>e. Headroom utilization shall clearly provide the breakup of headroom consumed by the Volumes or tagged application at storage array</p> <p>f. Providing the status of at-least top 5 volumes where latency is extremely high. It shall also provide shading functionality so that more severe hotspot can be easily identified.</p>		
12	Cloud Enabled - Anomaly Detection	<p>Cloud enabled Advance Analytics engine shall have capability to provide following:</p> <p>a. Analytics engine shall have in-built anomaly detection for a given storage volume so that it can provide the variance insight of high LUN latency / response time.</p> <p>b. Analytics engine shall clearly mark all those anomaly detection points on the given LUN / Volume latency graph and shall be applicable for both read and write operations.</p> <p>c. Anomaly detection shall also be applicable for a given storage volume throughput so that drift of workload can be easily identified from the usual read and write pattern.</p>		
13	Cloud Native data console Management - Life Cycle	<p>1. Management application shall be truly cloud native so that there shall be no need to configure, upgrade, patching of management application during the life-cycle of support contract and shall be offered as a service.</p> <p>2. In case, vendor need any additional service like clustering / federation for managing multiple arrays from a single console and doesn't have cloud native data console – then all required</p>		

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		accessories like dual Ethernet switches, cables, at-least dual management server in HA etc. shall be provided upfront for at-least 16 arrays.		
14	Site Assessment	<p>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.</p> <p>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.</p>		
15	Host Ports and Back-end Ports	<p>1. The offered Storage array shall have a minimum of 4 x 32Gbps Fiber Channel ports</p> <p>2. Offered storage shall support both Fiber Channel (FCP) as well as NVMeOF over Fiber channel.</p> <p>3. 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 even after upgrading to 64Gbps.</p> <p>4. Each offered controller shall have minimum of 48 PCI 4.0 lanes for NVMe disk connectivity.</p> <p>5. 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.</p>		
16	Global Hot Spare	<p>1. offered Storage Array shall support distributed Global hot Spare for offered Disk drives.</p> <p>2. Global hot spare shall be configure as per industry practice.</p>		

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17	Quality of service	<p>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.</p> <p>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.</p> <p>3. It shall be possible to change the quality of service Response time (In both milliseconds as well as Sub-milliseconds), IOPS, bandwidth specification at real time.</p>		
18	Capacity efficiency	<p>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.</p> <p>2. Vendor shall have flexibility to enable / disable the data efficiency engine at the time of Volume creation.</p> <p>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.</p>		
19	Firmware Upgrade	Offered storage shall support online non-disruptive firmware upgrade for both Controller and disk drives.		
20	Integration - Container	<p>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 :</p> <p>a. Shall support both Static and Dynamic provisioning</p> <p>b. Shall be able to expand, re-size the persistent volumes given to statefulset applications.</p> <p>c. Shall be able to create and delete the</p>		

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		<p>snapshots.</p> <p>d. Shall support CSI Raw block volume as well as CSI Volume cloning.</p> <p>e. Support for both Fiber channel as well as ISCSI.</p>		
21	Integration - VMware	<p>The offered storage system shall also be provided with VMware vCenter integration pack so that following day to day operations can be performed directly from the vCenter itself:</p> <p>a. Adding, deleting, expanding the datastore</p> <p>b. Scheduling and restoring datastore and VM snapshot.</p> <p>c. Mounting and applying QOS policy to datastore.</p> <p>d. Creation of VMs.</p> <p>e. RDM migration from VMFS to VVOL</p> <p>f. A common dashboard for providing the number of Storage subsystems, Volumes, Datastore, Virtual Machines, host and Clusters.</p> <p>g. Dashboard shall also provide IOPS, Latency and bandwidth information for Storage subsystem as well as Volumes.</p> <p>h. Dashboard shall also provide top 5 issues which are most recent and based upon the severity of the issue.</p>		
22	Snapshot / Point in time copy, No. of Volumes and Temper-proof protection	<p>1. The storage array should have support for controller-based snapshots (At-least 1024 copies for a given volume).</p> <p>2. The system must provide the capability to create immutable, read-only snapshots, that cannot be modified.</p> <p>3. The system shall provide the capability to create compliant, read-only snapshots, which makes it impossible to modify or delete the snapshot and its base volume by the user, a system administrator, and the manufacturer.</p> <p>4. The protection period of the above snapshots must be individually configurable between 1 minute and several years. Changing the system clock must not allow the tampering of protection.</p> <p>5. Offered Storage array shall support</p>		

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		more than 32000 base volume on the storage array without snapshot and clone.		
23	Remote Replication	<p>1. The storage array should support hardware based data replication at the array controller level across all models of the offered family.</p> <p>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.</p> <p>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.</p> <p>6. Offered storage subsystem shall support incremental replication after resumption from Link Failure situation or during failback operations.</p>		
24	Active / Active Stretch Clustering	<p>1. Offered Storage array shall have capability to provide true Active / Active Replication and 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.</p> <p>2. Active / Active replication shall be supported for all well-known OS like VMware, Redhat, Windows etc.</p>		
25	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.		

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Minimum Specification of SAN Switch (S1 No 8 of BOM)

Qty.	02 No.
Make	
Model	
Part No.	

Sl.No	Minimum Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
Architecture/Scalability/Performance/Management/Availability:			
1	Minimum Dual SAN switches shall be configured where each SAN switch shall be configured with minimum of 16 Ports scalable to 24		

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	ports.		
2	Required scalability shall not be achieved by cascading the number of switches and shall be offered within the common chassis only		
3	Should deliver 32 Gbit/Sec Non-blocking architecture with 1:1 performance for up to 24 ports in a energy-efficient fashion		
4	Should protect existing device investments with auto-sensing 8, 16, and 32 Gbit/sec capabilities.		
5	The switch shall support different port types such as F_Port, E_Port, M_Port, D_Port.		
6	The switch should be rack mountable		
7	Offered SAN Switch shall support less than 900 nanosecond for port to port latency with no contention.		
8	Offered switch shall support at-least 2000 dynamically allocated frame buffers.		
9	The switch shall provide Aggregate bandwidth of 768 Gbit/sec end to end.		
10	Switch shall have support for web based management and should also support CLI.		
11	The switch should have USB port for firmware download, support save, and configuration upload/download.		
12	Offered SAN switches shall be highly efficient in power consumption. Bidder shall ensure that each offered SAN switch shall consume less than 80 Watt of power.		
13	Switch shall support POST and online/offline diagnostics, including RAStrace logging, environmental monitoring, non-disruptive daemon restart, FCping and Pathinfo (FC traceroute), port mirroring (SPAN port).		

Minimum Specification of Tor Switch (S1 No 9 of BOM)

Qty.	4 No.
Make	
Model	
Part No.	

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Sl.No	Minimum Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Physical Characteristics and Port Requirements		
	The switch should be 1U 19" Rack Mountable		
	The switch should have redundant, field-replaceable, hot-swappable power supplies and Fan tray with front to back/back to front airflow		
	The switch should have minimum 24 ports of 1/10G SFP+ and 4 ports of 40GbE/100GbE (QSFP+/QSFP28) ports from day-1 (Populated with 10G SR and 100G DAC as per design requirement).		
	The switch should have RJ-45 serial or USB-C console port, RJ-45 Ethernet Management port and USB Interface		
2	Performance Requirements		
	The switch should have multi-core CPU/processor		
	The proposed switch should have minimum 16GB DRAM, 32GB Flash Memory/Storage and 32MB Packet buffer memory		
	The proposed switch should have minimum 1.2 Tbps switching capacity		
	The switch should support switch virtualization feature and providing Multi-chassis Link aggregation (MC-LAG) for uplink/downlink connectivity		
	The switch should have minimum 100K MAC Address Table size		
	The switch should support minimum 24K IPv4 routes, 12K IPv6 Routes and 4K IPv4/IPv6 Multicast Routes		
	The switch should support minimum 8K IPv4 ACLs and 4K IPv6 ACLs		
3	Operating System Capabilities		
	The switch should have modular operating system with micro-services or equivalent architecture providing superior fault tolerance and high availability		
	The switch OS should support programmability through REST APIs, Python scripting or equivalent		
4	Layer-2, QoS and Security Features		
	The switch should support Spanning Tree Protocol (STP/RSTP/MSTP) and Ethernet Ring Protection Switching (ERPS) for rapid protection and recovery		

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	The switch should support Link Aggregation Control Protocol (LACP)		
	The switch should support IEEE 802.1Q VLANs (1000 VLANs)		
	The switch should support Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR)/WRR		
	The switch should support Private VLAN for traffic isolation for users on the same VLAN		
	The switch should provide storm protection to limit unknown broadcast, multicast, or unicast storms with user-defined thresholds		
	The switch should support Internet Group Management Protocol (IGMPv1, v2, and v3) and Multicast Listener Discovery (MLDv1 and v2)		
	The switch should support 802.1x/Mac-auth/MAC lockdown/ MAC lockout		
5	Layer-3 Routing and Services Features		
	The switch should support IPv4,IPv6 Static Routing and RIPng		
	The switch should support Open shortest path first (OSPF) for IPv4 and IPv6		
	The switch should support Border Gateway Protocol 4 (BGP) for IPv4 and IPv6		
	The switch should support Policy Based Routing (PBR)		
	The switch should support Multicast Routing using PIM-SM/SSM and Multicast Service Delivery Protocol (MSDP)		
	The switch should support VXLAN with BGP-EVPN		
	The switch should support DHCP Server providing DHCP services (for IPv4 and IPv6)		
6	Management Features		
	The switch should support SNMP v2c/v3 and Remote monitoring (RMON)		
	The switch should support sFlow or equivalent for traffic analysis and IPFIX for flow analysis		
	The switch should provide advanced telemetry and automation features for monitoring, troubleshooting and improving network operations		
	The switch should support RADIUS and TACACS+ for securing administrative access		

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	The switch should have Command Line Interface (CLI) with a hierarchical structure and SSH, Secure FTP/TFTP support		
	The switch should support Port mirroring		
7	Certifications and Industry Recognition		
	The switch should have RoHS compliance		
	The switch should have safety/emissions certifications including EN55032:2015/CISPR 32, Class A, FCC CFR 47 Part 15:2018, Class A ICES-003, Class A		
8	Support and Warranty		
	The switch shall be offered with minimum five years hardware warranty with Technical support from OEM directly		
	All the features mentioned in the specifications shall be enabled/activated. Any licenses required shall be included from Day 1		

Minimum Specification of Firewall (Sl No 11 of BOM)

Qty.	1 No.
Make	
Model	
Part No.	

Sl.No	Minimum Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
<u>A</u>	<u>Eligibility Criteria</u>		

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1	Solution should be purpose build hardware appliance.		
2	The OEM shall provide 365x7x24 days technical support. The OEM shall provide the login credentials to raise the technical issues in the name of customer, search knowledgebase, download the patches and upgrades, documents and manage the device on OEM sites. The successful Bidder must provide the login credentials.		
3	The provided hardware should not be end of support during the contractual period. It should continue to provide a) Upgrades and latest OS version in market b) Updates c) Patches and Fixes		
4	All the components of the solution shall be from the same OEM		
5	The appliance should not have any active internal or external Wi-Fi component. Proposed OEM must be in Gartner Leader in latest NFWG magic quadrant.		
B	<u>Specification</u>		
1	The proposed firewall solution shall run on a hardened OS and delivered on purposeful built hardware and security appliance.		
2	Firewall Appliances shall be rack mountable and rack mount kit shall be supplied along.		
3	Solution shall provide features and licenses for contractual period for Firewall, IPS, Site to Site VPN, Granular Application control on same appliance managed through a separate centralized management console.		
4	Solution shall support Application level and "Stateful" policy inspection technology to prevent traffic leakage. It shall also have application intelligence for commonly used TCP/IP protocols like telnet, ftp, http, web 2.0 application etc.		
5	The proposed security platform should support High Availability in future.		
6	Firewall Appliance shall provide high availability in Active- Active and Active-Passive mode. Appliance failover shall be completely stateful in nature without any manual intervention and should be completely transparent to end-user without any session drops.		
7	Appliance shall not require any downtime/ reboot for failover & backup purpose.		
8	Firewall OS, CVE (Common Vulnerabilities and		

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	Exposures) must be available/disclosed on public web sites		
9	It shall be possible to centrally manage Firewall and all the associated modules/ functionalities/ services over secure channel.		
10	solution shall be supplied with the support for static and dynamic routing protocols.		
11	The solution shall support VLAN tagging (IEEE 802.1q).		
12	Solution shall have inbuilt integration with Identity Awareness Capabilities without any external devices. Integration shall work with/without any agent on the remote side.		
13	Solution shall support Application awareness and granular control functionalities for all the commonly available Web 2.0 applications. Solution must have minimum 10,000+ application signature on day1.		
14	shall provide IPv4 and IPv6 support including NAT64 , NAT66 & NAT 46.		
15	Solution shall support Link aggregation functionality (LACP/PAGP) to group multiple ports as single Channel.		
16	Solution must support the policies to block the credit card, Bank numbers etc.... also must provide flexibility to create the polices to block file types and direction of data passing via firewall (download and upload etc..).		
17	The firewall appliance shall support upto 20 or more virtual systems/VDOM/virtual contexts. The functionality can be requested in future however all virtual domains must work as dedicated NGTP firewall with all feature.		
C	<u>Performance Requirements</u>		
2	Shall have Next Generation Firewall throughput of more than 21 Gbps with Application Control, FW and IPS with logging enabled in Enterprise Mix / Application Mix traffic.		
3	Shall have Next Generation IPS throughput of at least 24 Gbps with logging enabled in Enterprise Mix / Application Mix traffic.		
4	Shall support at least 16 million concurrent sessions/connection and minimum 320000 new connection per second		
5	Solution shall have minimum following ports: <ul style="list-style-type: none"> - 8 usable 1Gig interfaces Copper - 4 usable 1Gig and 10Gig SFP+ Interfaces (with SR transceivers) - Separate & Dedicated 1 x 1G port for out of band 		

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	management - Separate & dedicated port for HA connectivity		
6	Must have integrated redundant power supplies		
7	Solution architecture should have Control Plane separated physically or virtually from the Data Plane.		
8	solution hardware should be a multicore CPU architecture with a hardened 64-bit operating system and shouldn't use any proprietary based ASIC architecture.		
9	Should support minimum of 64GB of RAM or higher from day 1.		
10	Must have 400 GB of SSD storage		
D	<u>Network Protocols/Standards Support Requirements</u>		
1	Solution shall support the deployment in Routed or Transparent Mode		
2	Must support Static, RIP, OSPF, OSPFv3 and BGP		
3	The proposed firewall shall be able to handle unknown /unidentified applications with actions like allow, block or alert		
4	The proposed firewall shall have granular application identification technology based upon deep packet inspection		
5	The proposed firewall shall warn the end user with a customizable page when the application is blocked		
6	The proposed firewall shall delineate specific instances of instant messaging/Social Network Applications (Facebook Chat,WhatsApp,Telegram,WeChat etc.)		
7	The Firewall shall provide stateful engine support for all common protocols of the TCP/IP stack.		
8	The Firewall shall provide NAT functionality, including dynamic and static NAT translations.		
9	Firewall should have creating access-rules with IPv4 & IPv6 objects wise, user/groups wise, application wise, application wise geolocation control, url wise, zone wise, vlan wise, etc.		
10	Should have more than 10,000+ pre-defined distinct application signature (excluding custom application signatures) as application detection mechanism to optimize security effectiveness and should be able to create new application categories for operational efficiency		

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11	Solution modules shall support authentication protocols like RADIUS/ TACACS+ etc.		
12	Proposed NGFW OEM must support zero day attack protection with integration of on-Prem Anti-APT/Sandboxing/Threat inspector appliance. The Anti-APT device must be available from same OEM of NGFW and can be managed from same central management console at On-prem. Solution must provide malware analysis as well as CDR functionality. This functionality may require in future however solution must be available with OEM from during bidding.		
13	a) Network address translation (NAT) shall be supported so that the private IP addresses of hosts and the structure of an internal network can be concealed by the firewall.		
	b) Network Address Translation (NAT) shall be configurable as 1:1, 1: many, many: 1, many: many.		
	c) Reverse NAT shall be supported.		
	d) Port address translation /Masquerading shall be supported.		
14	Dynamic Host Configuration Protocol (DHCP) & Virtual Private Network (VPN) shall be supported		
15	The firewall shall support Internet Protocol Security (IPsec).		
	support Key exchange with latest Internet Key Exchange (IKE), Public Key Infrastructure PKI (X.509)		
	Support Latest Encryption algorithms including AES 128/192/256(Advanced Encryption Standards), 3DES etc.		
	Support Latest Authentication algorithms including SHA-1(Secure Hash Algorithm-1), SHA-2(Secure Hash Algorithm-2) etc.		
	IPsec NAT traversal shall be supported		
E	<u>Firewall Policy Requirements</u>		
1	Firewall/shall be able to configure rules based on the following parameter -- a) Source/Destination IP/Port/Geo locations b) Time and date access c) User/group role (After Integration with AD) d) Customizable services e) Combination of one or multiple of above mentioned parameters		
2	It shall support the VOIP Applications Security by supporting to filter SIP, H.323, MGCP etc.		

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3	<p>Firewall shall support Access for Granular user, group & machine based visibility and policy enforcement. It shall have following features:</p> <p>a) The firewall shall mask/NAT the internal network from the external world.</p> <p>b) Multi-layer, stateful, application -inspection-based filtering shall be supported.</p> <p>c) It shall provide network segmentation features with capabilities that facilitate deploying security for various internal, external and DMZ (Demilitarized Zone) sub-groups on the network, to prevent unauthorized access.</p> <p>d) Ingress/egress filtering capability shall be provided.</p> <p>e) There shall be support for detection of reconnaissance attempts such as IP address sweep, port scanning etc.</p> <p>f) Basic attack protection features listed below but not limited to :</p> <ul style="list-style-type: none"> • It shall enable rapid detection of network attacks • SYN cookie protection/SYN Flood • Protection against IP spoofing • Out of state TCP packets protection" 		
4	<p>The proposed solution must support Policy Based forwarding based on:</p> <ul style="list-style-type: none"> - Zone - Source or Destination Address - Source or destination port/service - AD/LDAP user or User Group - Application, sub applications groups 		
5	<p>NGFW Appliance should have a feature of holding multiple policy versions to support resilience & easy rollbacks during the incidents</p>		
6	<p>Solution must support Configuration of dual stack gateway on a bond interface, OR on a sub-interface of a bond interface</p>		
7	<p>RFC 2464 Transmission of IPv6 Packets over Ethernet Networks must be supported.</p>		
<u>H</u>	<p><u>Product certifications</u></p>		
1	<p>should obtain minimum EAL4+ and ICSA certification</p>		
2	<p>Must obtain recommended rating in NSS lab report.</p>		
3	<p>must obtain IPv6 ready/USGv6R1 standard certification to support IPV6 features.</p>		
<u>I</u>	<p><u>Administration, Management , Logging & Reporting</u></p>		
1	<p>The Firewall Management Solution , log server and reporting server can be either hardware appliance or VM based solution at On-prem only.</p>		
2	<p>Solution must have tracking mechanism for the changes done on policy management dashboard and maintain</p>		

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	audit trails.		
3	In case of VM based management solution, All other third party licenses including OS, software components, databases etc. for running the solution has to be provided by the bidder for the entire duration of the project. All licenses shall be Enterprise class. Solution has to be configured by the bidder to cater to smooth operation of the whole solution should be scalable to use more storage and compute if required.		
4	The Solution shall receive logs for the overall proposed solution in a single system, and shall not be separate for each module of proposed firewalls.		
5	The management platform must include an integration mechanism, preferably in the form of open APIs and/or standard interfaces, to enable events and log data to be shared with external network and security management applications, such as Security Information and Event Managers (SIEMs), and log management tools.		
7	The proposed solution must support the ability to lock configuration while modifying it, avoiding administrator collision when there are multiple people configuring the appliance		
8	Solution must have the granularity of administrators that works on parallel on same policy without interfering each other		
9	Solution must be able to segment the rule base in a sub-policy structure in which only relevant traffic is being forwarded to relevant policy segment for an autonomous system		
10	Solution must be able to install threat related protections and access related rules separately		
11	Log viewer must have a free text search capability		

Minimum Specification of Link Load Balancer (S1 No 12 of BOM)

Qty.	01 No.
Make	
Model	
Part No.	

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Sl.No	Minimum Specification	Specification (Quoted / Applicable – by the bidder)	Complied (Yes / No)
1	Minimum Layer4 Throughput of 3 Gbps		
2	Solution should provide minimum 80,000 Connection per Second on Layer 4		
4	The solution should provide minimum 6x GE RJ45 Interfaces from day one.		
5	The solution should support 4 million ore more Layer 4 Concurrent Connections		
6	Should support minimum 500 SSL TPS (2K Keys)		
7	Should provide minimum 5 Gbps of Compression Throughput		
8	Should provide minimum 500 Mbps of SSL Bulk Encryption Throughput		
9	The solution should provide minimum 10 Virtual contexts from day one		
10	The solution should have minimum 8 GB of Memory & 64 GB SSD as local storage from day one		
11	Solution must aggregate WAN links from a single or multiple ISPs for inbound/outbound traffic load balancing & redundancy. WAN Links must support IPv4 or IPv6 addressing or both simultaneously.		
12	Must support PPPoE WAN links with static or dynamic IP address allocation		
13	Should support DHCP WAN links		
14	Should support Static IP WAN inks		
15	Must support more than one WAN link on each physical port using an external WAN-side VLAN switch.		
16	Must support 802.1Q VLAN on all ports		
17	Must support LACP/Link Aggregation		
18	Must support Routing Default route(s), Static Route(s), Policy Route(s) for both IPv6 and IPv4, and dynamic Reverse Route Cache for both IPv4		
19	Should support OSPFv2 & OSPF Authentication & BGP		
20	Should support Static NAT functionalities		
21	Should support Port Forwarding (nat port, ip pool)		

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22	Must support multiple WAN link health detection function		
23	Configurable intervals, retries and timeouts		
24	Should support outbound link load balancing methods like Weighted Round Robin, Least Connections, Least New Connections per Second, Least Throughput Outbound, Least Throughput Inbound, Least Throughput Total, Spill over Throughput Outbound, Spill over Throughput Inbound, Spill over		
25	The solution should have facility to configure persistence rules identify traffic that should be ignored by load balancing rules and instead be forwarded to the same gateway each time the traffic traverses		
26	Must support A/AAAA Records for inbound load balancing		
27	Should support Persistence Methods like Source-destination pair, Source-destination address, Source address, Destination address		
28	Solution should have proximity routes option		
29	Should able to route traffic based on source/target IP, port, protocol, priority to different ISPs, failover, max throughput supported		
30	Should support inbound methods like Round Robin, Weighted Round Robin, Proximity, and all GSLB functions (Proximity, Region, etc..)		
31	Should support Smart DNS like the LLB DNS can be used with Smart DNS for more advanced DNS resolution, such as region, proximity support.		
32	Must provide inter-site Tunnels with inbound/outbound failover and load balancing		
33	Tunnels must support flexible "packet bonding" across multiple WAN links to support higher singles-session data rates than would be available on any single WAN link.		
34	Should support LLB detailed link statistics reporting and monitor graphs		
35	MUST support simple management access i.e. without the need for local management clients (HTTPS preferred)		
36	MUST support SNMP for polling of system statistics		
37	MUST support SNMP Traps for key system thresholds (specify)		
38	Solution should be quoted with 3 years support		

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Minimum specification of Integrated Rack Data Centre Solution

Sl.No	Requirement	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1	Scope of Work		
a.	<ul style="list-style-type: none"> • Integrated Rack Data Centre solution should be intelligent and should have facility of inbuilt UPS, Precision cooling unit, Fire detection and Fire Suppression system, environmental monitoring and DCIM software etc. • Modular and reliable design for power and cooling: The critical components used to design the system should be redundant and in the Events of failure, the components shall be easily maintainable and shall be the responsibility of both OEM and bidder. All the components of the infrastructure should be such that it can be easily dismantled and relocated to different location. • This specification covers intelligent integrated/inbuilt infrastructure, standalone system design, engineering, manufacture, assembly, testing at manufacturer's works, supply, delivery at site, unloading, handling, proper storage at site, erection, testing and commissioning at site of complete infrastructure for the proposed Data Centre as detailed in the specification, complete with all accessories required for efficient and trouble-free operations 		
2	Primary Data Centre Requirements		
a.	Integrated Rack Infrastructure Solution with inbuilt Cold and Hot aisle containment of 02 racks should cater IT load of Min 20 kw with a provision of adding 2more rack in future with one In row cooling to cater total load of 40KW. Both Hot & Cold aisle containment should be part of the rack frame.		
b.	The Intelligent Integrated Infrastructure essentially includes internal redundant or backup power supplies, environmental controls (e.g., precision air conditioning, fire suppression, smoke detection, water leak detection, humidity sensor, intelligent monitoring system, security devices, etc.) Air-conditioning system is to have 100 % reliability on 24 x 7 basis with adequate standby for system redundancy. (Failure of any single unit; still to meet the total cooling requirement). The ambient temperature considered for the calculation of total tonnage requirement should be 45 Degrees.		
c.	The detail specifications of the Integrated Solution, standalone system shall be in adherence to Standard Data Centre guidelines thus shall be composed of multiple active power and cooling distribution paths, but only one path active. Should have redundant components.		
d.	Critical Component's for Integrated Rack DC solution i.e., Rack, Rack aisle Containment, rack IPDU, In row Cooling, UPS, and DCIM software along with Environmental monitoring & TH sensors should be from same & single OEM for Seamless Integration & better Service Supports		
e.	OEM Qualification:- ISO9001, ISO 14001, ISO 27001:2013,ISO45001:2018,ISO 50001		

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Minimum specification of UPS 20 KVA with 30 minutes Backup (BOQ Sl. No. 13.1,13.2 & 13.3)

Qty.	2 Nos.
Make	
Model	
Part No.	

Sl.No	UPS 20 KVA with 30 minutes Backup	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1	UPS should be with capacity of min 20KW, with pf up to unity and efficiency at least 95.5%.Should be in N+N topology.		
2	True On-line UPS with Widest input range (331V-477V) or better.		
3	Double conversion and IGBT technology: Full IGBT Rectifier / Battery Charger and IGBT based Inverter		
4	Printed Circuit Boards in the UPS frame shall be 100% conformally coated.		
5	Facility for Remote Monitoring		
6	UPS shall have built-in feature to test UPS at 100% Load without the need of any external Load Bank. In case this feature is not available within the UPS, Vendor shall provide a External Load Bank equal to UPS Capacity which will be kept at the site till the Warranty period ends.		
7	UPS should have feature of Common battery bank		
8	UPS should have inbuilt feature of detecting the waveform in fault condition		
9	Battery backup of 30 minutes for each UPS at load power factor 0.8, ECV – 1,7 via 12V SMF Batteries.		
10	AC-AC Efficiency in normal operation from 25% load to 75 % Load shall be > 95%.		

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Minimum specification of Server Rack (BOQ Sl. No. 13.4)

Qty.	2 Nos.
Make	
Model	
Part No.	

Sl.No	Rack frame and Usable Space	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1.	2 Nos. of 42 U racks of dimension 800 mm x 1200 mm (Server Rack) and 2 Nos. of 42U rack if dimension 800X1200mm (For future provision) with integrated hot & cold aisle containment of minimum 400mm as hot Aisle & 200mm as Cold Aisle. Both Hot & Cold aisle containment should be part of the rack frame. Rack should be UL Certificate, documentary evidence needs to be submitted at the time of bidding. Load bearing capacity 1200 KG.		
2.	Status based LED light to be provided on each rack.		
3.	Each rack enclosure should be physically separated through caged partition at cold & hot aisle to avoid unauthorized access from one rack to another.		

Minimum specification of Rack PDU (BOQ Sl. No. 13.5)

Qty.	04 Nos.
Make	
Model	
Part No.	

Sl.No	Requirement	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1.	Power Distribution		

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a.	<p>Each IT Rack should have two intelligent rack PDU's. Intelligent rack PDU should have minimum 36 outlets of C13 and 6 outlets of C19 with minimum 1.8-meter input cable with IEC309 Socket. IPDU should be of 16Amp 3 phase, IPDU should provide real time monitoring of connected loads and user-define alarms.</p> <p>Display Interface:- LCD display with function button which allows to monitor current, power, and voltage measurement of connected devices.</p> <p>Product Certification: VDE Standards : CSA C22.2 No 60950, IEC 60950, UL 60950-1</p>		
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Minimum specification of Rack Aisle Containment (BOQ Sl. No. 13.6)

Qty.	1 No.
Make	
Model	
Part No.	

Sl.No	Rack frame and Usable Space	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1.	<p>2 Nos. of 42 U racks of dimension 800 mm x 1200 mm (Server Rack) and 2 Nos. of 42U rack if dimension 800X1200mm (For future provision) with integrated hot & cold aisle containment of minimum 400mm as hot Aisle & 200mm as Cold Aisle.</p> <p>Both Hot & Cold aisle containment should be part of the rack frame.</p>		
2.	<p>Each rack enclosure should be physically separated through caged partition at cold & hot aisle to avoid unauthorized access from one rack to another.</p>		

Minimum specification of Environmental Monitoring with DCIM Software (BOQ Sl. No. 13.7 & 13.8)

Qty.	01 Lot.
Make	
Model	
Part No.	

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Sl.No	Environmental Monitoring with DCIM Software.	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1.	Environmental Monitoring		
a	Intelligent Integrated rack should include basic environmental monitoring: <ul style="list-style-type: none"> • Water Leak Detection system. • Temperature and Humidity Sensors for measuring Temperature & Humidity. • Alarm beacon 		
2.	DCIM Monitoring		
a.	Detailed DCIM Monitoring & Diagnostics through DCIM software ,1U rack mountable server/VM server which capable of single window monitoring of all the critical equipment's like UPS, INROW, Rack PDU, parameters through a single window dashboard over Ethernet & Capable for sending Email Alerts		
b.	UPS, INROW, Cooling, IPDU & TH sensor monitoring unit should be integrated with DCIM software to monitor all critical parameters. Any alarm generated in these equipment's to be displayed through DCIM software in single dashboard. Monitoring unit should be integrated with energy meter of the Integrated rack DB Panel & should be able to monitor the Main Input power Voltage, Current, power consumption. DCIM should also get fire alarm panel status on DCIM. DCIM software should provide Multi-vendor device support. Monitoring system should support customizable Windows and Linux client application that enables instant access to monitoring system application from anywhere on the network. Proposed DCIM solution OEM should be engaged in the development of data center infrastructure management systems whose products have been in satisfactory use in similar service for a minimum of 10 years under the same brand name with undisputed business continuity.		
c.	The Monitoring Application shall allow the user to create user accounts ranging from Administrator Access to View Only Access with unique login username and password.		
d.	Authentication and Encryption: The communication between the client and the Monitoring Application shall be secured via a Secure Sockets Layer (SSL) 256-bit Triple-DES (Data Encryption Standard) encoded connection. The DCIM vendor to follow an ISO 30111-conformant vulnerability handling process.		
e.	If required in future DCIM software should be capable of adding Change management, Capacity Management kind of modules.		
f.	If required in future DCIM software should be capable of adding multiple sites on same software.		
g.	Min. 11 inch touch screen HMI – Graphical User Interface display should be mounted on the Integrated rack solution for local monitoring & capable of monitoring of the Integrated rack Data Centre		

Minimum specification of Row based Precision Cooling (BOQ Sl. No. 13.9 & 10)

Qty.	02 Nos.
Make	

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Model	
Part No.	

Sl.No	Requirement	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
a.	Precision Air Cooling solution should be of nominal capacity 30 kW capacity with standby (N+1 redundancy)		
b.	Data Centre server and network racks should be cooled with In-row Variable Speed compressor cooling units to provide closed loop precision cooling system which should be able to cool the equipment's uniformly right from 1st U to 42nd U of Rack		
c.	Precision Air Cooling units should be catering 40 KW IT load considering future load with current load of 20KW, in N+1 topology throughout. Width of Each Cooling unit should be 300mm to have compact design. The total cooling net sensible capacity of min 40KW @ 6400 CFM (at N+1 configuration) for given design conditions: -Unit should be designed for ambient temperature of 45 Deg C and supply temperature 22 Deg C at cold aisle.		
d.	The compressor should achieve the capacity modulation by adjusting speed of the compressor to achieve the better efficiency in part load & unit should have EEV. The compressor should be placed at the outdoor unit to reduce the any major service activity at IDU or inside the server room.		
e.	The Indoor unit should have variable speed EC fans & should be hot swappable during any failure or replacement. The unit should have inbuilt Heater and Humidifier. Also, Indoor unit have the option of dual power connections to have continuous cooling without any downtime.		
f.	Outdoor unit should be with variable speed axial fans with EC motor & coil with copper tubes & aluminum fins.		
g.	Unit should have internal condensate Pump & filters should be MERV 1 efficient. The filter should be replaceable from the rear of the unit.		
h.	Microprocessor based Controller with touch screen display & provide capacity of the unit & airflow and all the logs.		
i.	All Cooling units equipped with direct expansion circuit should be suitable for R410A refrigerant. The unit should support longer piping distance if required based on the site condition.		
j.	UL Listed		

Minimum specification of Electrical DB Panel (BOQ Sl. No 13.11)

Qty.	1 Lot.
Make	
Model	
Part No.	

Sl.No	Requirement	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)

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1	DB panel should be mounted on to utility rack with N+N redundancy and all internal cabling integrated into the same. Essential and proper load capacity MCB/MCCB should be provided with electrical system. Two IPDUs inside each racks should be connected by two separate N+N UPS Source. DB panel mounted on Utility rack shall be covered with Novec 1230 Gas/FK-5-1-12 based fire suppression system.		
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**Minimum specification of IBMS (FAS, Fire Suppression, RRS, CCTV, Biometric Access Control) –
(BOQ Sl.13.12)**

Qty.	1 Lot.
Make	
Model	
Part No.	

Sl.No	Requirement : Fire Safety, VESDA, Security, Access Control & RRS	Specification (Quoted/ Applicable - by the bidder)	Compliance (Yes/No)
1	Fire detection and suppression system should be mounted in panel side of integrated Racks or nearby wall to avoid consumption of any usable U space. It should have Fire alarm and fire suppression unit and the fire suppression agent should be NOVEC 1230 Gas/FK-5-1-12 as per NFPA guidelines. The fire suppression gas should cover entire volume of Integrated Rack Data Centre.		
2.	HSSD system/VESDA should be the part of Integrated Rack Data center to get early smoke detection alarm.		
3.	IP based Biometric Access Control System shall be provided to serve the objective of allowing access to authorized personnel only. The front & rear rack doors will be provided with magnetic locks and will operate on fail-safe principle through one common Biometric access control system.		
4.	The Integrated Rack Data Centre Infrastructure should be covered with Rodent repellent system		
5.	2MP Motion sensing IP Based CCTV camera with NVR, 1TB Storage and POE switch to be provided for live monitoring at Integrated Rack Data Centre Infrastructure.		
6.	Rodent Repellent should be part of Integrated solution.		

Authorized Signatory (Signature In full): _____

Name and title of Signatory: _____

Stamp of the Company: _____