केनरा बैंक Canara Bank

Corrigendum-7 to GeM Bid ref. no GEM/2024/B/4915191 dated 04/05/2024 for Selection of vendor for Supply, Installation, Configuration, Implementation and Maintenance of 500 Nos. of Servers and other IT Infra Components in Canara Bank.

It is decided to amend the following in respect of the above RFP:

a. GeM bid document (Bid End date/ Bid Opening Date, Page no. 1 of 7):

Description	Existing details	Amended details
Bid End Date/Time	08/07/2024, 15:00:00	15/07/2024, 15:00:00
Bid opening Date/Time	08/07/2024, 15:30:00	15/07/2024, 15:30:00

b.

Sl. No	Section/Annexure/Appendix of GeM Bid	Clause No.	Existing Clause	Amended Clause
1.	Section C - Deliverable and Service Level Agreements	9. Warranty	9.2. The selected bidder has to provide comprehensive On-site warranty for Three (3) years for proposed Hardware from the date of installation of the Hardware, System Software, OS, licenses etc., supplied	9.2. The selected bidder has to provide comprehensive On-site warranty for Three (3) years for proposed Hardware, software and other items from the date of project acceptance & Signoff.
2.	Annexure-8 Scope of Work	Evaluation for Scope of Work for this project	Sl. No. 6. The warranty for the proposed hardware will start on the date when the operating system and any other provided software are installed, as mentioned in the Scope of Work for the specific hardware.	Sl. No. 6. The warranty for the proposed hardware will start from the date of project acceptance & Signoff, as mentioned in the Scope of Work for the specific hardware.
3.	Annexure-9 Technical Specifications	Entire Annexure	Existing Annexure	Amended Annexure-9 Technical Specifications attached to this Corrigendum.
4.	Annexure-16 Bill of Material	Entire Annexure	Existing Annexure	Amended Annexure-16 Bill of Material attached to this Corrigendum.

All the other instructions and terms & conditions of the above RFP shall remain unchanged.

Please take note of the above amendments while submitting your response to the subject RFP

Date: 05/07/2024
Place: Bengaluru

Deputy General Manager

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Amended Annexure-9
Technical Specifications
(Should be submitted on Company's letter head with company seal and signature of the authorized person)

SUB: Supply, Installation, Configuration, Implementation and Maintenance of 500 Nos. of Servers and other IT Infra Components in Canara Bank.

Ref: GEM/2024/B/4915191 dated 04/05/2024.

Note:	
(a)	If the bidder feels that certain features offered are superior to what has been specified by the Bank, it shall be highlighted separately. Information regarding any modification required in the proposed solution to meet the intent of the specifications and state-of-the-art technology shall be provided. However, the Bank reserves the right to adopt the modifications /superior features suggested/ offered.
(b)	The bidder shall provide all other required equipments and/or services, whether or not explicitly mentioned in this RFP, to ensure the intent of specification, completeness, operability, maintainability and upgradability.
(c)	The selected bidder shall own the responsibility to demonstrate that the product offered are as per the specification/performance stipulated in this RFP and as committed by the bidder either at site or in bidder's work site without any extra cost to the Bank.

All points mentioned under are mandatory to comply and non-compliance to any of the point lead to disqualification of the bidder during evaluation.

Technical Specifications for 500 servers (287 DC and 213 DRC)

Table-A
Technical Specification - 80 servers (41 DC and 39 DRC)

Technical Details		Technical Specification - 80 servers (41 DC and 39 DRC)	Bidder's Compliance (Yes/No)
Sl. No.	Technical Factor	Description	
1	Make	Bidder to specify	
2	Model	Bidder to specify	
3	Power Factor	Bidder to specify	
4	Form Factor	1U / 2U	
5	**Processor**		
	Processor Architecture	CISC	
	Processor Make	Latest generation x86_64 bit architecture-based CPU's	
	Processor	2.7 GHz (gigahertz) or above	
	Socket	Minimum 2 populated sockets i.e., 32*2 =64 core	

	Cores per socket	32	
	Cache per processor	32 MB L3 Cache or higher	
	Cooling	Heat Sink	
	Platform Controller Hub & Main Board	Latest Chipset / System on Chip (SoC) design. Supporting x86_64 & Suitable server class Main Board or equivalent	
6	**Memory**		
	RAM Type	DDR5 DIMM or Higher	
	Ram Size	64G*32/96GB*22/128G*16= approx 2TB	
	Slot Count	Minimum 24 or higher.	
	Speed	Minimum 2933 MHz or higher (memory speed should be compatible with process speed to provide better performance)	
	Features	Advanced ECC (Error Correcting Code) type or similar technology	
7	**SSD**		
	Types of interface for SSD	SATA / NVMe	
	Total Capacity for SSD	960GB * 2 SSD 1.92TB * 4 SSD	
	Slot Count	12 or higher, Minimum 6 free slots should be available for future upgrade	
	Usable Space	Minimum 900 GB approximately with 960GB*2SSD After RAID 1. Minimum 3.5 TB approximately with 1.92TB * 4SSD after RAID 10.	
8	**RAID Controller**		
	RAID Controller	Should support RAID 1, 5, 6, 10 or higher	
	RAID Battery	RAID 1, 5, 6, 10 or higher with 2GB or higher battery backed write cache	
	Cooling	Heat Sink	
	Alarm Buzzer	Alarm Buzzer or error indication alerts or equivalent	
	Storage Health Inspector	Storage Health Inspector or tools to monitor Storage/disk health	
	Features	Automatic and configurable RAID Rebuilding / Single-RAID or Multi-RAID Arrays per Controller	

9	SAN & Network		
	FC HBA CARD	Two FC Card with minimum 1 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable)	
	FC Cables	2 Nos of minimum 20 Meter OM3/OM4 FC cables or higher for SAN Connectivity (FC HBA & transceivers should Support 16 Gbps & 32Gbps Switch)	
	Network ports 1 Gbps	Four 1Gbps network ports: can be Base-T On-board or in separate NIC (Must be in two network cards with two 1Gbps ports in each card)	
	Network ports 10 Gbps	Four 10Gbps network ports: can be Base-T On-board or in separate NIC (Must be in two network cards with two 10 Gbps ports in each card)	
	Server Management port	Dedicate One Port of 1GBps-management port chassis card.	
10	OS &Hypervisor Compatibility		
	Virtualization compatibility	All latest version of Microsoft-HyperV,VMware, Red Hat virtualization, Open shift virtualization and other industry standard hypervisors, Open Shift, Kubernetics	
	Windows Compatibility	2019/2022	
	RHEL Compatibility	8.x & 9.x & Higher versions	
	Other Latest Linux Flavours	Latest server operating versions of SUSE Linux, Ubuntu ,RHCOS/Redhat Open Shift Container Platform	
11	Power Supply	Redundant hot swappable power supply, with required power cables	
12	BIOS	UEFI (Unified Extensible Firmware Interface) based system and firmware that supports secure boot)	
13	Warranty And Support	3 Years onsite warranty+ 2 years AMC, On-Site Support Warranty including part replacement/repairs within 6 hours of reporting, and Firmware support for updates, upgrades, patches, and bug	

		fixes for supplied h/w from OEM 24 x 7 x 365 days. SSD drives should be covered for irrespective of read/writes on them. In case of Disk failure, the faulty disk will be maintained /destroyed / Degauss by Canara Bank. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS. Faulty Disks would not be retuned back to OEM/Vendor or faulty disks will be destroyed before returning.	
14	Port	3 USB 2.0 port or higher and 1 VGA Port or higher	
15	Serviceability	Light path diagnostic LED or equivalent visual alerts	
16	Security	Silicon root of trust, authenticated BIOS, signed firmware updates and BIOS Live Scanning for malicious firmware Secure Boot, Disk encryption, TPM 2.0 (Trusted Platform Module), Hardware root of trust, malicious code free design.	
17	PCI Slots	Minimum 6 -PCIe Gen4 or higher slots(Peripheral Component Interconnect Express)	
18	Remote Management	1) Management of hardware and software components, Power on/off, boot process, Management log, dedicated Management ports. Should able to integrate with industry wide KVM (Kernel-based Virtual Machine) solution. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures. Telemetry Streaming, Idle Server Detection.	

		2)Management software should provide Role Based Security through LDAP or Local and able to provide pre-failure alarms for CPU, Memory & HDD by SMTP.	
19	System Management Solution	1. The system management solution is required. The system management solution should collect system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to Support to troubleshoot the issue and provide an appropriate solution. 2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. 3. The system management solution should be provided: a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule.	

		b. Scope based access control to limit Users to specific group of devices c. Bare-metal server deployment d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation. e. Manage remote devices and control power	
20	Monitoring and Analytics	1. Offered servers shall have monitoring an analytics engine for proactive management. All required licenses for same shall be included in the offer. 2. Monitoring and analytics engine shall have the capability to provide the following: i. Health and system security monitoring and notification emails ii. Performance monitoring and anomaly detection iii. REST API for integrating data with automation, ticketing, and other tools iv. Visualize server telemetry including key performance, environmental, and power metrics v. Displays heath, inventory, alerts,	

		performance, and warranty status	
21	Drivers & Accessories	Drivers for the compatible OS, Add on cards and other accessories to be Provided.	
22	FAN	Server should have redundant fully populated Hot swappable fans	

Table-B
Technical Specification - 28 servers (17 DC and 11 DRC)

Technical Details		Technical Specification - 28 servers (17 DC and 11 DRC)	Bidder's Compliance (Yes/No)
Sl. No.	Technical Factor	Description	
1	Make	Bidder to specify	
2	Model	Bidder to specify	
3	Power Factor	Bidder to specify	
4	Form Factor	1U / 2U	
5	Processor		
	Processor Architecture	CISC	
	Processor Make	Latest generation x86_64 bit architecture-based CPU's	
	Processor	2.7 GHz (gigahertz) or above	
	Socket	Minimum 2 populated sockets i.e., 32*2 =64 core	
	Cores per socket	32	
	Cache per processor	32 MB L3 Cache or higher	
	Cooling	Heat Sink	
	Platform Controller Hub & Main Board	Latest chipset/system on clip(SoC)design supporting x 86_64& suitable server class main board or equivalent.	
6	Memory		
	RAM Type	DDR5 DIMM or Higher	
	Ram Size	64GB*8 = 512 GB	

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	Slot Count	Minimum 24 or higher, Minimum 16 free memory slots should be available.	
	Speed	Minimum 2933 MHz or higher (memory speed should be compatible with process speed to provide better performance)	
	Features	Advanced ECC (Error Correcting Code) type or similar technology	
7	**SSD**		
	Types of interface for SSD	SATA / NVMe	
	Total Capacity for SSD	960GB * 2 SSD 1.92TB * 4 SSD	
	Slot Count	12 or higher, Minimum 6 free slots should be available for future upgrade	
	Usable Space	Minimum 900 GB approximately with 960GB*2SSD After RAID 1. Minimum 3.5 TB approximately with 1.92TB * 4SSD after RAID 10.	
8	**RAID Controller**		
	RAID Controller	Should support RAID 1, 5, 6, 10 or higher	
	RAID Battery	RAID 1, 5, 6, 10 or higher with 2GB or higher battery backed write cache	
	Cooling	Heat Sink	
	Alarm Buzzer	Alarm Buzzer or error indication alerts or equivalent	
	Storage Health Inspector	Storage Health Inspector or tools to monitor Storage/disk health	
	Features	Automatic and configurable RAID Rebuilding / Single-RAID or Multi-RAID Arrays per Controller	
9	**SAN & Network**		
	FC HBA CARD	Two FC Card with minimum 1 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable)	

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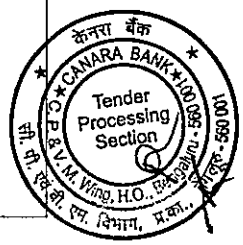
	FC Cables	2 Nos of minimum 20 Meter OM3/OM4 FC cables or higher for SAN Connectivity (FC HBA & transceivers should Support 16 Gbps & 32Gbps Switch)	
	Network ports 1 Gbps	Four 1Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 1Gbps ports in each card)	
	Network ports 10 Gbps	Four 10Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 10 Gbps ports in each card)	
	Server Management port	Dedicate One Port of 1GBps-management port chassis card.	
10	OS &Hypervisor Compatibility		
	Virtualization compatibility	All latest version of Microsoft-HyperV,VMware, Red Hat virtualization, Open shift virtualization and other industry standard hypervisors, Open Shift, Kubernetics	
	Windows Compatibility	2019/2022	
	RHEL Compatibility	8.x & 9.x & Higher versions	
	Other Latest Linux Flavours	Latest server operating versions of SUSE Linux, Ubuntu ,RHCOS/Redhat Open Shift Container Platform	
11	Power Supply	Redundant hot swappable power supply, with required power cables	
12	BIOS	UEFI (Unified Extensible Firmware Interface) based system and firmware that supports secure boot)	
13	Warranty And Support	3 Years onsite warranty+ 2 years AMC, On-Site Support Warranty including part replacement/repairs within 6 hours of reporting, and Firmware support for updates, upgrades, patches, and bug fixes for supplied h/w from OEM 24 x 7 x 365 days. SSD drives should be covered for irrespective of	



		read/writes on them. In case of Disk failure, the faulty disk will be maintained /destroyed / Degauss by Canara Bank. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS. Faulty Disks would not be retuned back to OEM/Vendor or faulty disks will be destroyed before returning.	
14	Port	3 USB 2.0 port or higher and 1 VGA Port or higher	
15	Serviceability	Light path diagnostic LED or equivalent visual alerts	
16	Security	Secure Boot, Disk encryption, TPM 2.0 (Trusted Platform Module), Hardware root of trust, malicious code free design.	
17	PCI Slots	Minimum 6 -–PCIe Gen4 or higher slots(Peripheral Component Interconnect Express)	
18	Remote Management	1) Management of hardware and software components, Power on/off, boot process, Management log, dedicated Management ports. Should able to integrate with industry wide KVM (Kernel-based Virtual Machine) solution. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures. Telemetry Streaming, Idle Server Detection. 2)Management software should provide Role Based Security through LDAP or Local and able to provide pre-failure alarms for CPU, Memory & HDD by SMTP.	

19	System Management Solution	1. The system management solution is required. The system management solution should collect system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to Support to troubleshoot the issue and provide an appropriate solution. 2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. 3. The system management solution should be provided: a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule. b. Scope based access control to limit	

		Users to specific group of devices c. Bare-metal server deployment d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation. e. Manage remote devices and control power	
20	Monitoring and Analytics	1. Offered servers shall have monitoring an analytics engine for proactive management. All required licenses for same shall be included in the offer. 2. Monitoring and analytics engine shall have the capability to provide the following: i. Health and system security monitoring and notification emails ii. Performance monitoring and anomaly detection iii. REST API for integrating data with automation, ticketing, and other tools iv. Visualize server telemetry including key performance, environmental, and power metrics Displays heath, inventory, alerts, performance, and warranty status	

21	Drivers & Accessories	Drivers for the compatible OS, Add on cards and other accessories to be Provided.	
22	FAN	Server should have redundant fully populated Hot swappable fans	

Table-C

Technical Specification - 100 servers (60 DC and 40 DRC)

Technical Details		Technical Specification - 100 servers (60 DC and 40 DRC)	Bidder's Compliance (Yes/No)
Sl. No.	Technical Factor	Description	
1	Make	Bidder to specify	
2	Model	Bidder to specify	
3	Power Factor	Bidder to specify	
4	Form Factor	1U / 2U	
5	Processor		
	Processor Architecture	CISC	
	Processor Make	Latest generation x86_64 bit architecture-based CPU's	
	Processor	2.7 GHz (gigahertz) or above	
	Socket	Minimum 2 sockets i.e., 16*2=32 core	
	Cores per socket	16	
	Cache per processor	32 MB L3 Cache or higher	
	Cooling	Heat Sink	
	Platform Controller Hub & Main Board	Latest chipset/System on chip (SoC) design supporting x86_64 & suitable server classmain board or equivalent.	
6	Memory		
	RAM Type	DDR5 DIMM or Higher	
	Ram Size	64GB*16 = 1024 GB	
	Slot Count	Minimum 24 or higher, Minimum 8 free memory slots should be available.	
	Speed	Minimum 2933 MHz or higher (memory speed should be compatible with process speed to provide better performance)	

	Features	Advanced ECC (Error Correcting Code) type or similar technology	
7	SSD		
	Types of interface for SSD	SATA / NVMe	
	Total Capacity for SSD	960GB * 2 SSD 1.92TB * 4 SSD	
	Slot Count	12 or higher, Minimum 6 free slots should be available for future upgrade	
	Usable Space	Minimum 900 GB approximately with 960GB*2SSD After RAID 1. Minimum 3.5 TB approximately with 1.92TB * 4SSD after RAID 10.	
8	RAID Controller		
	RAID Controller	Should support RAID 1, 5, 6, 10 or higher	
	RAID Battery	RAID 1, 5, 6, 10 or higher with 2GB or higher battery backed write cache	
	Cooling	Heat Sink	
	Alarm Buzzer	Alarm Buzzer or error indication alerts or equivalent	
	Storage Health Inspector	Storage Health Inspector or tools to monitor Storage/disk health	
	Features	Automatic and configurable RAID Rebuilding / Single-RAID or Multi-RAID Arrays per Controller	
9	SAN & Network		
	FC HBA CARD	Two FC Card with minimum 1 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable)	
	FC Cables	2 Nos of minimum 20 Meter OM3/OM4 FC cables or higher for SAN Connectivity (FC HBA & transceivers should Support 16 Gbps & 32Gbps Switch)	
	Network ports 1 Gbps	Four 1Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 1Gbps ports in each card)	

	Network ports 10 Gbps	Four 10Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 10 Gbps ports in each card)	
	Server Management port	Dedicate One Port of 1GBps-management port chassis card.	
10	OS &Hypervisor Compatibility		
	Virtualization compatibility	All latest version of Microsoft-HyperV,VMware, Red Hat virtualization, Open shift virtualization and other industry standard hypervisors, Open Shift, Kubernetics	
	Windows Compatibility	2019/2022	
	RHEL Compatibility	8.x & 9.x & Higher versions	
	Other Latest Linux Flavours	Latest server operating versions of SUSE Linux, Ubuntu ,RHCOS/Redhat Open Shift Container Platform	
11	Power Supply	Redundant hot swappable power supply, with required power cables	
12	BIOS	UEFI (Unified Extensible Firmware Interface) based system and firmware that supports secure boot)	
13	Warranty And Support	3 Years onsite warranty+ 2 years AMC, On-Site Support Warranty including part replacement/repairs within 6 hours of reporting, and Firmware support for updates, upgrades, patches, and bug fixes for supplied h/w from OEM 24 x 7 x 365 days. SSD drives should be covered for irrespective of read/writes on them. In case of Disk failure, the faulty disk will be maintained /destroyed / Degauss by Canara Bank. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming	

		obsolete/EOL & EOS. Faulty Disks would not be retuned back to OEM/Vendor or faulty disks will be destroyed before returning.	
14	Port	3 USB 2.0 port or higher and 1 VGA Port or higher	
15	Serviceability	Light path diagnostic LED or equivalent visual alerts	
16	Security	Secure Boot, Disk encryption, TPM 2.0 (Trusted Platform Module), Hardware root of trust, malicious code free design.	
17	PCI Slots	Minimum 6 - PCIe Gen4 or higher slots(Peripheral Component Interconnect Express)	
18	Remote Management	1. Management of hardware and software components, Power on/off, boot process, Management log, dedicated Management ports. Should able to integrate with industry wide KVM (Kernel-based Virtual Machine) solution. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures. Telemetry Streaming, Idle Server Detection. 2)Management software should provide Role Based Security through LDAP or Local and able to provide pre-failure alarms for CPU, Memory & HDD by SMTP.)	

19	System Management Solution	1. The system management solution is required. The system management solution should collect system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to Support to troubleshoot the issue and provide an appropriate solution. 2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. 3. The system management solution should be provided: a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule. b. Scope based access control to limit Users to specific group of devices	

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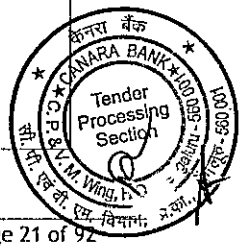
		c. Bare-metal server deployment d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation. e. Manage remote devices and control power	
20	Monitoring and Analytics	1. Offered servers shall have monitoring an analytics engine for proactive management. All required licenses for same shall be included in the offer. 2. Monitoring and analytics engine shall have the capability to provide the following: i. Health and system security monitoring and notification emails ii. Performance monitoring and anomaly detection iii. REST API for integrating data with automation, ticketing, and other tools iv. Visualize server telemetry including key performance, environmental, and power metrics Displays heath, inventory, alerts, performance, and warranty status	
21	**Drivers & Accessories**	Drivers for the compatible OS, Add on cards and other accessories to be Provided.	

22	FAN	Server should have redundant fully populated Hot swappable fans	

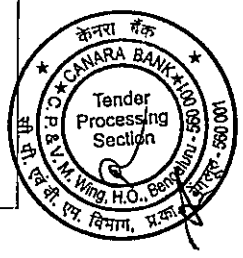
Table-D
Technical Specification - 54 servers (28 DC and 26 DRC)

Technical Details		Technical Specification - 54 servers (28 DC and 26 DRC)	Bidder's Compliance (Yes/No)
Sl. No.	Technical Factor	Description	
1	Make	Bidder to specify	
2	Model	Bidder to specify	
3	Power Factor	Bidder to specify	
4	Form Factor	1U / 2U	
5	Processor		
	Processor Architecture	CISC	
	Processor Make	Latest generation x86_64 bit architecture-based CPU's	
	Processor	2.7 GHz (gigahertz) or above	
	Socket	Minimum 2 sockets i.e., 16*2 =32 core	
	Cores per socket	16	
	Cache per processor	32 MB L3 Cache or higher	
	Cooling	Heat Sink	
	Platform Controller Hub & Main Board	Latest Chipset / System on Chip (SoC) design. Supporting x86_64 & Suitable server class Main Board or equivalent	
6	Memory		
	RAM Type	DDR5 DIMM or Higher	
	Ram Size	32G*8=256GB	
	Slot Count	Minimum 24 or higher, Minimum 16 free memory slots should be available.	
	Speed	Minimum 2933 MHz or higher (memory speed should be compatible with process speed to provide better performance)	

	Features	Advanced ECC (Error Correcting Code) type or similar technology	
7	**SSD**		
	Types of interface for SSD	SATA / NVMe	
	Total Capacity for SSD	960GB * 2 SSD 1.92TB * 4 SSD	
	Slot Count	12 or higher, Minimum 6 free slots should be available for future upgrade	
	Usable Space	Minimum 900 GB approximately with 960GB*2SSD After RAID 1. Minimum 3.5 TB approximately with 1.92TB * 4SSD after RAID 10.	
8	**RAID Controller**		
	RAID Controller	Should support RAID 1, 5, 6, 10 or higher	
	RAID Battery	RAID 1, 5, 6, 10 or higher with 2GB or higher battery backed write cache	
	Cooling	Heat Sink	
	Alarm Buzzer	Alarm Buzzer or error indication alerts or equivalent	
	Storage Health Inspector	Storage Health Inspector or tools to monitor Storage/disk health	
	Features	Automatic and configurable RAID Rebuilding / Single-RAID or Multi-RAID Arrays per Controller	
9	**SAN & Network**		
	FC HBA CARD	Two FC Card with minimum 1 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable)	
	FC Cables	2 Nos of minimum 20 Meter OM3/OM4 FC cables or higher for SAN Connectivity (FC HBA & transceivers should Support 16 Gbps & 32Gbps Switch)	
	Network ports 1 Gbps	Four 1Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with	



		two 1Gbps ports in each card)	
	Network Ports 10 Gbps	Four 10Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 10 Gbps ports in each card)	
	Server Management port	Dedicate One Port of 1GBps-management port chassis card.	
10	OS &Hypervisor Compatibility		
	Virtualization compatibility	All latest version of Microsoft-HyperV,VMware, Red Hat virtualization, Open shift virtualization and other industry standard hypervisors, Open Shift, Kubernetics	
	Windows Compatibility	2019/2022	
	RHEL Compatibility	8.x & 9.x & Higher versions	
	Other Latest Linux Flavours	Latest server operating versions of SUSE Linux, Ubuntu ,RHCOS/RedhatOpen Shift Container Platform	
11	Power Supply	Redundant hot swappable power supply, with required power cables	
12	BIOS	UEFI (Unified Extensible Firmware Interface) based system and firmware that supports secure boot)	
13	Warranty And Support	3 Years onsite warranty+ 2 years AMC, On-Site Support Warranty including part replacement/repairs within 6 hours of reporting, and Firmware support for updates, upgrades, patches, and bug fixes for supplied h/w from OEM 24 x 7 x 365 days. SSD drives should be covered for irrespective of read/writes on them. In case of Disk failure, the faulty disk will be maintained /destroyed / Degauss by Canara Bank.	



		Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS. Faulty Disks would not be retuned back to OEM/Vendor or faulty disks will be destroyed before returning.	
14	Port	3 USB 2.0 port or higher and 1 VGA Port or higher	
15	Serviceability	Light path diagnostic LED or equivalent visual alerts	
16	Security	Secure Boot, Disk encryption, TPM 2.0 (Trusted Platform Module), Hardware root of trust, malicious code free design.	
17	PCI Slots	Minimum 6 - PCIe Gen4 or higher slots(Peripheral Component Interconnect Express)	
18	Remote Management	1) Management of hardware and software components, Power on/off, boot process, Management log, dedicated Management ports. Should able to integrate with industry wide KVM (Kernel-based Virtual Machine) solution. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures. Telemetry Streaming, Idle Server Detection. 2)Management software should provide Role Based Security through LDAP or Local and able to provide pre-failure alarms for CPU, Memory & HDD by SMTP.	
19	System Management Solution	1. The system management solution is required. The system management solution should collect	

		system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to Support to troubleshoot the issue and provide an appropriate solution. 2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. 3. The system management solution should be provided: a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule. b. Scope based access control to limit Users to specific group of devices c. Bare-metal server deployment	

		d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation. e. Manage remote devices and control power	
20	Monitoring and Analytics	1. Offered servers shall have monitoring an analytics engine for proactive management. All required licenses for same shall be included in the offer. 2. Monitoring and analytics engine shall have the capability to provide the following: i. Health and system security monitoring and notification emails ii. Performance monitoring and anomaly detection iii. REST API for integrating data with automation, ticketing, and other tools iv. Visualize server telemetry including key performance, environmental, and power metrics Displays heath, inventory, alerts, performance, and warranty status	

21	**Drivers & Accessories**	Drivers for the compatible OS, Add on cards and other accessories to be Provided.	
22	FAN	Server should have redundant fully populated Hot swappable fans	

Table-E

Technical Specification - 226 servers (135 DC and 91 DRC)

Technical Details		Technical Specification - 226 servers (135 DC and 91 DRC)	Bidder's Compliance (Yes/No)
Sl. No.	Technical Factor	Description	
1	Make	Bidder to specify	
2	Model	Bidder to specify	
3	Power Factor	Bidder to specify	
4	Form Factor	1U / 2U	
5	**Processor**		
	Processor Architecture	CISC	
	Processor Make	Latest generation x86_64 bit architecture-based CPU's	
	Processor	2.7 GHz (gigahertz) or above	
	Socket	Minimum 2 sockets i.e., 16*1 =16 core (1 Populated & 1 For future upgrade) or 8*2 = 16 core	
	Cores per socket	Refer above socket details	
	Cache per processor	32 MB L3 Cache or higher for 16 Core CPU 22 MB L3 Cache or higher for 8 Core CPU	
	Cooling	Heat Sink	
	Platform Controller Hub & Main Board	Latest Chipset / System on Chip (SoC) design. Supporting x86_64 & Suitable server class Main Board or equivalent	
6	**Memory**		
	RAM Type	DDR5 DIMM or Higher	
	Ram Size	64GB*8 = 512 GB	

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	Slot Count	Minimum 12 or higher, Minimum 4 free memory slots should be available.	
	Speed	Minimum 2933 MHz or higher (memory speed should be compatible with process speed to provide better performance)	
	Features	Advanced ECC (Error Correcting Code) type or similar technology	
7	**SSD**		
	Types of interface for SSD	SATA / NVMe	
	Total Capacity for SSD	960GB * 2 SSD 1.92TB * 4 SSD	
	Slot Count	12 or higher, Minimum 6 free slots should be available for future upgrade	
	Usable Space	Minimum 850 GB approximately after 960GB*2SSD After RAID 1. Minimum 3.5 TB approximately after 1.92TB * 4SSD after RAID 10.	
8	**RAID Controller**		
	RAID Controller	Should support RAID 1,10 (other raid configuration support preferable)	
	Cooling	Heat Sink	
	Alarm Buzzer	Alarm Buzzer or error indication alerts or equivalent	
	Storage Health Inspector	Storage Health Inspector or tools to monitor Storage/disk health	
	Features	Automatic and configurable RAID Rebuilding / Single-RAID RAID or Multi-RAID Arrays per Controller	
9	**SAN & Network**		
	FC HBA CARD	One FC Card with minimum 2 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable)	
	FC Cables	2 Nos of minimum 20 Meter OM3/OM4 FC cables or higher for SAN Connectivity (FC HBA & transceivers	

		should Support 16 Gbps & 32Gbps Switch)	
	Network ports 10 Gbps	Two 10Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in one network cards with two 10 Gbps ports in each card)	
	Server Management port	Dedicate One Port of 1GBps-management port chassis card.	
10	OS &Hypervisor Compatibility		
	Virtualization compatibility	All latest version of Microsoft-HyperV,VMware, Red Hat virtualization, Open shift virtualization and other industry standard hypervisors, Open Shift, Kubernetics	
	Windows Compatibility	2019/2022	
	RHEL Compatibility	8.x & 9.x & Higher versions	
	Other Latest Linux Flavours	Latest server operating versions of SUSE Linux, Ubuntu ,RHCOS/RedhatOpen Shift Container Platform	
11	Power Supply	Redundant hot swappable power supply, with required power cables	
12	BIOS	UEFI (Unified Extensible Firmware Interface) based system and firmware that supports secure boot)	
13	Warranty And Support	3 Years onsite warranty+ 2 years AMC, On-Site Support Warranty including part replacement/repairs within 6 hours of reporting, and Firmware support for updates, upgrades, patches, and bug fixes for supplied h/w from OEM 24 x 7 x 365 days. SSD drives should be covered for irrespective of read/writes on them. In case of Disk failure, the faulty disk will be maintained /destroyed / Degauss by Canara Bank. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change	

		of components @ zero cost in case of any part becoming obsolete/EOL & EOS. Faulty Disks would not be retuned back to OEM/Vendor or faulty disks will be destroyed before returning.	
14	Port	3 USB 2.0 port or higher and 1 VGA Port or higher	
15	Serviceability	Light path diagnostic LED or equivalent visual alerts	
16	Security	Secure Boot, Disk encryption, TPM 2.0 (Trusted Platform Module), Hardware root of trust, malicious code free design.	
17	PCI Slots	Minimum 2 - PCIe Gen4 or higher slots(Peripheral Component Interconnect Express	
18	Remote Management	1) Management of hardware and software components, Power on/off, boot process, Management log, dedicated Management ports. Should able to integrate with industry wide KVM (Kernel-based Virtual Machine) solution. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures. Telemetry Streaming, Idle Server Detection. 2)Management software should provide Role Based Security through LDAP or Local and able to provide pre-failure alarms for CPU, Memory & HDD by SMTP.	

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19	System Management Solution	1. The system management solution is required. The system management solution should collect system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to Support to troubleshoot the issue and provide an appropriate solution. 2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. 3. The system management solution should be provided: a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule. b. Scope based access control to limit	

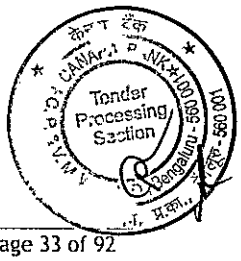
		Users to specific group of devices c. Bare-metal server deployment d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation. e. Manage remote devices and control power	
20	Monitoring and Analytics	1. Offered servers shall have monitoring an analytics engine for proactive management. All required licenses for same shall be included in the offer. 2. Monitoring and analytics engine shall have the capability to provide the following: i. Health and system security monitoring and notification emails ii. Performance monitoring and anomaly detection iii. REST API for integrating data with automation, ticketing, and other tools iv. Visualize server telemetry including key performance, environmental, and power metrics v. Displays heath, inventory, alerts,	

		performance, and warranty status	
21	Drivers & Accessories	Drivers for the compatible OS, Add on cards and other accessories to be Provided.	
22	FAN	Server should have redundant fully populated Hot swappable fans	

Table-F
Custom Technical Specification - 12 servers

Technical Details		Custom Technical Specification - 12 servers (6 DC and 6 DRC) (Type 1 - 2 DC, 2 DRC; Type 2 - 2 DC, 2 DRC; Type 3 - 2 DC, 2 DRC)	Bidder's Compliance (Yes/No)
Sl. No.	Technical Factor	Description	
1	Make	Bidder to specify	
2	Model	Bidder to specify	
3	Power Factor	Bidder to specify	
4	Form Factor	1U / 2U / 4U	
5	Processor		
	Processor Architecture	CISC	
	Processor Make	Latest generation x86_64 bit architecture-based CPU's	
	Processor	2.7 GHz (gigahertz) or above	
	Socket	Minimum 2 sockets i.e., 16*1 =16 core (1 Populated & 1 For future upgrade) or 8*2=16 core - Type 1 Minimum 2 sockets i.e., 16*2 = 32 core- Type 2 Minimum 2 sockets i.e., 16*2 = 32 core- Type 3	
	Cores per socket	Refer above socket details	
	Cache per processor	32 MB L3 Cache or higher for 16 core CPU 22 MB L3 Cache or higher for 8 score CPU	
	Cooling	Heat Sink	

	Platform Controller Hub & Main Board	Latest Chipset / System on Chip (SoC) design. Supporting x86_64 & Suitable server class Main Board or equivalent	
6	**Memory**		
	RAM Type	DDR5 DIMM or Higher	
	Ram Size	64GB*4 = 256 GB - Type 1 64GB*16 = 1024 GB - Type 2 64GB*16 = 1024 GB - Type 3	
	Slot Count	Minimum 12 or higher, Minimum 8 free memory slots should be available. - Type Minimum 24 or higher, Minimum 8 free memory slots should be available. - Type 2 Minimum 24 or higher, Minimum 8 free memory slots should be available. - Type 3	
	Speed	Minimum 2933 MHz or higher (memory speed should be compatible with process speed to provide better performance)	
	Features	Advanced ECC (Error Correcting Code) type or similar technology	
7	**SSD**		
	Types of interface for SSD	NVMe	
	Total Capacity for SSD	960GB * 2 SSD For all types 1.92TB * 4 SSD -For Type 1 1.92TB * 8 SSD - For Type 2 3.84TB * 18 SSD - For Type 3	



	Slot Count	12 or higher, Minimum 6 free slots should be available for future upgrade - Type1 12 or higher, Minimum 2 free slots should be available for future upgrade - Type2 24 or higher, Minimum 4 free slots should be available for future upgrade - Type3	
	Usable Space	Minimum 900 GB approximately with 960GB*2SSD After RAID 1 for all types Minimum 3.5TB approx. after RAID 10 - Type 1 Minimum 7.5 TB approx. After RAID 10 - Type 2 Minimum 34 TB approx. After RAID 10 - Type 3	
8	RAID Controller		
	RAID Controller	Should support RAID 1,10 (other RAID configuration support preferable) - Type 1 Should support RAID 1, 5, 6, 10 or higher - Type 2 & Type3	
	RAID Battery	RAID 1, 5, 6, 10 or higher with 2GB or higher battery backed write cache - Type 2 & Type 3	
	Cooling	Heat Sink	
	Alarm Buzzer	Alarm Buzzer or error indication alerts or equivalent	
	Storage Health Inspector	Storage Health Inspector or tools to monitor Storage/disk health	

	Features	Automatic and configurable RAID Rebuilding / Single-RAID or Multi-RAID Arrays per Controller	
9	SAN & Network		
	FC HBA CARD	One FC Card with minimum 2 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable) - Type 1 Two FC Card with minimum 1 number of 32 Gbps FC ports in each card with Supported SFP+ transceivers (With NVME Capable) - Type 2 & Type 3	
	FC Cables	2 Nos of minimum 20 Meter OM3/OM4 FC cables or higher for SAN Connectivity (FC HBA & transceivers should Support 16 Gbps & 32Gbps Switch) -Type1& Type 2 & Type 3	
	Network ports 1 Gbps	Four 1Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 1Gbps ports in each card) - Type 2 & Type3	
	Network ports 10 Gbps	Two 10Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in one network cards with two 10 Gbps ports) - Type 1 Four 10Gbps network ports: can be Base-T On-board or in sperate NIC (Must be in two network cards with two 10 Gbps ports in each card) - Type 2 & Type3	
	Server Management port	Dedicate One Port of 1GBps-management port chassis card.	
10	OS &Hypervisor Compatibility		
	Virtualization compatibility	All latest version of Microsoft-HyperV,VMware, Red Hat virtualization, Open shift virtualization and other industry standard	

		hypervisors, Open Shift, Kubernetes	
	Windows Compatibility	2019/2022	
	RHEL Compatibility	8.x & 9.x & Higher versions	
	Other Latest Linux Flavours	Latest server operating versions of SUSE Linux, Ubuntu ,RHCOS/RedhatOpen Shift Container Platform	
11	Power Supply	Redundant hot swappable power supply, with required power cables	
12	BIOS	UEFI (Unified Extensible Firmware Interface) based system and firmware that supports secure boot)	
13	Warranty And Support	3 Years onsite warranty+ 2 years AMC, On-Site Support Warranty including part replacement/repairs within 6 hours of reporting, and Firmware support for updates, upgrades, patches, and bug fixes for supplied h/w from OEM 24 x 7 x 365 days. SSD drives should be covered for irrespective of read/writes on them. In case of Disk failure, the faulty disk will be maintained /destroyed / Degauss by Canara Bank. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS. Faulty Disks would not be retuned back to OEM/Vendor or faulty disks will be destroyed before returning.	
14	Port	3 USB 2.0 port or higher and 1 VGA Port or higher	
15	Serviceability	Light path diagnostic LED or equivalent visual alerts	
16	Security	Secure Boot, Disk encryption, TPM 2.0 (Trusted Platform Module), Hardware	

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		root of trust, malicious code free design.	
17	PCI Slots	Minimum 2 - PCIe Gen4 or higher slots(Peripheral Component Interconnect Express) - Type 1 Minimum 6 - PCIe Gen4 or higher slots(Peripheral Component Interconnect Express) - Type2 & Type3	
18	Remote Management	1) Management of hardware and software components, Power on/off, boot process, Management log, dedicated Management ports. Should able to integrate with industry wide KVM (Kernel-based Virtual Machine) solution. Monitoring fan, power supply, memory, CPU, RAID, NIC for failures. Telemetry Streaming, Idle Server Detection. 2)Management software should provide Role Based Security through LDAP or Local and able to provide pre-failure alarms for CPU, Memory & HDD by SMTP.	
19	System Management Solution	1. The system management solution is required. The system management solution should collect system information (including impending component failure) from the device that generated the alert and sends the information securely to OEM to	

		Support to troubleshoot the issue and provide an appropriate solution. 2. The system management solution should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. 3. The system management solution should be provided: a. Firmware and configuration baselines for compliance monitoring and enable automated updates on schedule. b. Scope based access control to limit Users to specific group of devices c. Bare-metal server deployment d. Power and thermal Monitoring, alarm, and automatically execute rules based remediation.	

		e. Manage remote devices and control power	
20	Monitoring and Analytics	1. Offered servers shall have monitoring an analytics engine for proactive management. All required licenses for same shall be included in the offer. 2. Monitoring and analytics engine shall have the capability to provide the following: i. Health and system security monitoring and notification emails ii. Performance monitoring and anomaly detection iii. REST API for integrating data with automation, ticketing, and other tools iv. Visualize server telemetry including key performance, environmental, and power metrics Displays heath, inventory, alerts, performance, and warranty status	
21	**Drivers & Accessories**	Drivers for the compatible OS, Add on cards and other accessories to be Provided.	
22	**FAN**	Server should have redundant fully populated Hot swappable fans	

Below table to be consider for estimating the cable requirement for the above 500 servers. However, any additional cables required over and above the estimated quantity for completion of the project should be supplied by the vendor without any additional cost.

Ethernet CAT6/7			
Length	DRC Qty	DC Qty	Cable Color
3M	84		RED/GREEN
5M	114	300	RED/GREEN
7M	162		RED/GREEN
10M	168	300	RED/GREEN
3M	42		orange color
5M	42		orange color
7M	42		orange color
10M	84		orange color
15M	42	300	orange color

Table-G

Storage Technical Specifications: (Object Storage 2.5PB Usable Space: DC -1, DRC -1)

Sl. No.	Particulars	Detailed Configuration	Bidder's Compliance (Yes/No)
1.	Make	Bidders to specify	
2.	Model	Bidders to specify	
3.	Form Factor	Bidders to specify	
4.	Power Factor	Bidder to specify	

5.	Architecture	Controllers shall be active-active so that all volumes are automatically load balanced without needing administrative intervention for manual balancing of workloads/volumes. Connectivity -Object interface would be scalable S3. its architecture shall include the following: o S3-Server: S3 API Server for Buckets/Objects and more o Scale-Out "any-to-any" access o Security model S3-Bucket: Security service for Accounts a. Multi-tenant, Support for S3 IAM - Identity and Access Management. b. Bucket & Object ACLs o S3-Metadata: Distributed Metadata Engine o S3 Object Lock o Transparent Bucket-Level At-REST Encryption o S3 Console: GUI Web interface to manage accounts, users, policy and monitor usage. o S3 Browser: GUI Web interface to create buckets and upload objects. o Quota for S3. o Federated Access "Single Sign On" to S3 bucket. o Compatible with Active Directory. o Volume protection feature (can't modify/delete files once written to the volume). o Supports mixed environment Windows & Linux. o Built in load balancing	
6.	Type	Near Line Drives & SSD Disk for meta handling	
7.	Memory & Cache	Minimum 64 GB per controller/node	
8.	Capacity	Minimum usable storage 2.5 PB after erasure coding/industry standard applicable disk redundancy	
9.	Drives	2.5" to 3.5" drives	
10.	Hard Disk Capacity	Each hard disk Capacity should not be less than 15 TB	
11.	Scalability	Up to 10PB with scale out architecture. The cluster scales by adding additional nodes without sacrificing performance, which allows a more cost-effective linear storage expansion than fork-lift upgrades. New Nodes & Failed nodes and disks can be swapped out without downtime.	

12.	Performance	object stores can provide high sequential throughput performance, which makes them great for streaming large files. Also, object storage services help eliminate networking limitations. Files can be streamed in parallel over multiple pipes, boosting usable bandwidth	
13.	Disk and Node Redundancy	The proposed storage should support erasure coding. The Proposed storage should be able to add disks/Nodes and automatically balance the data across all the nodes.	
14.	Encryption	should have native encryption capabilities as per PCI DSS standards and encryption should not add any performance overheads	
15.	Backup	During power failure, Data in the cache should be safely written to the disks prior to performing a graceful shutdown. Data loss in storage should be zero due to any issues noticed in the Datacenter or any natural calamities.	
16.	Services	Proposed storage array should include storage based compression, storage to storage replication for the entire supported capacity of the storage array from day one. All the required or necessary licenses must be perpetual and provided for the Full capacity of each storage from Day one. This should include licenses for Management and monitoring module and all the storage features such as Replication etc. Upgrade in capacity should not incur any additional license cost. Offered storage system have online and historical performance reporting capability.	
17.	Protocol Support	HTTPS, ,RESTAPIs, S3 Protocol & all kinds of rest full APIs. Vendor shall configure the licenses all interfaces All above protocol shall be native to cluster and shall not require any additional gateway. Vendor can provision additional gateway if required from performance perspective but capability shall be native to main nodes only.	
18.	Operating System Support	Support for multiple Operating Systems versions connecting to it, including but not restricted to Windows 2019,2022 or later, UNIX (AIX & Solaris & HP Unix), Linux (Red hat, SUSE & OEL), Red Hat OpenShift Container Platform Plus, Hypervisor (vSphere, Hyper V, red hat virtualization, Oracle virtualization)	

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		Support for multiple hardware environment but not limited to X86 machines and IBM power machines	
19.	Ports	Minimum 4 Number of 10/25 Gigabit for IP Traffic per node and Minimum 2 Number of 10/25 Gbps for Replication (Network). Minimum Two Management Ports of 1Gbps	
20.	Warranty and Support	3 Years, Comprehensive, On-Site Support Warranty with 2 years AMC including part replacement /repairs within 6 hours of reporting, and Software support for updates, upgrades, patches, and bug fixes for supplied s/w from OEM 24 x 7 x 365 days. In case of Disk failure, the faulty disk will be destroyed/ degaussed on replacement. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS during the warranty period.	
21.	Other Features	The proposed storage system should support SNMP, Address resolution protocol, Network Time Protocol, LDAP. The Storage array should be licensed with Performance monitoring tools should be offered with the storage array. The proposed storage system shall support a browser based GUI built in management. All objects stored in Object Storage have a URL. All objects have their own metadata. Developers interact with the object storage system through a RESTful HTTP API. Object data can be located anywhere in the cluster. Backup & Recovery: Data backup and recovery rely on accessible and reliable storage. Object-based storage provides the infrastructure for secure data backup and efficient recovery procedures. There shall be no separate and dedicated control node or metadata node in the cluster. In case, nodes are separate then vendor shall over Metadata / control nodes in HA using active / active approach. Offered solution shall be completely redundant and there shall be no single point of failure. Offered solution shall have file integrity checking	

		when reading the file and automatic rebuilt if an error is detected.	
22.	Uptime	The storage should be able to provide availability parameter of 99.99% from the date of acceptance of the Storage by Bank	
23.	Power Supply	Storage should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified.	
24.	No Single point of Failure	Offered Storage Array should be based on a No Single Point of Failure (NSPOF) architecture with complete redundancy of controllers, power, cooling, etc.	
25.	Global Hot Spare	Offered Storage Array shall support distributed Global hot Spare capacity for offered Disk drives.	
26.	Software	Management software must include both GUI and CLI tools. Management of the storage system should be through single management tool. The GUI must be able to configure all features, monitor the status and health of the storage system. If licensed, separately, the vendor needs to provide necessary licenses for full capacity. Vendor should provide storage array management software for configuration, administration and monitoring. Vendor shall offer the enterprise version of the software if there are multiple versions of the software. Software shall be able to manage all arrays of the same family. The performance monitoring should be real-time and historical providing IOPS response time and utilization of individual components within the storage array. Log Maintenance facility should be available. Storage should be compatible to integrate with Bank monitoring tool	
27.	Remote Replication	2-way replication. (It should support both synchronous and Asynchronous replication without any data loss)	
28.	End of Sale & End of Support	The proposed Hardware and Software generation should be latest from the date of RFP submission and the proposed Hardware and Software should not become End of Sales for Three years from the date of delivery of hardware & End of support for 6 years from the date of delivery of hardware	

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29.	Controller & Availability	Minimum four controllers are required to provide 2.5PB usable space, hot swappable controllers for high availability, load balancing and redundant modes. Minimum 20 core should be available per controller Offered Storage array should be an enterprise class storage system with 99.9999% Data Availability guarantee.	
30.	Data Management Features	1. it shall be possible to tag and search S3 Metadata. 2. Lifecycle Management - It shall be possible to automatically transition and expiration of data based on criteria. 3. it shall be possible to asynchronously replicate/copy bucket to several Cloud targets 4. Offered storage shall support multi-tenancy and data isolation	
31.	Ease of USE	1. Offered storage shall have full management and control with Supervisor and CLI • Powerful graphing capabilities & dashboards and Graphical Usage Monitoring • Auditing capabilities. • REST APIs For monitoring & management 2. Offered storage shall support role Based Access Control (RBAC)	
32.	Compliance	1. Offered storage shall ensure that Data must be tamper-proof. 2. Data must be kept for a specified period which means offered storage shall provide retention mechanism. 3. Offered storage shall have capability to migrate the data to an alternative media like tapes or any another cloud/on premises object storage.	
33.	Simplifying operations and management	The proposed Hardware and Software generation should be latest from the date of RFP submission and the proposed Hardware and Software should not become End of Sales for Three years from the date of delivery of hardware & End of support for 6 years from the date of delivery of hardware Offered storage shall be have Simplified Operations & Management and shall provide: • Software Upgrades, Server replacements, or Capacity Extensions don't stop the system	

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		• Automated disk failure detection • Automatically rebuild for failed drive • Automated storage rebalancing • Disk replacement utility • Easily add servers or hard drives in the server • The system shall automatically rebuild the missing data in case of a hardware component failure.	
34.	Multi-cloud	1. Offered storage shall provide the following features: • Shall Support writing data to any Cloud (Amazon S3, Google Cloud Storage, Microsoft Azure, Wasabi) via a single S3 API. • Shall have Open-Source interface allows developers to quickly test compatibility. • Shall Preserves native format of the data on any Cloud for providing the ability to read data directly on the public Clouds. • Shall support Replicating one to many so that a given bucket can be replicated/copied to several private and public Cloud targets. • Shall support Lifecycle data to any Cloud for automatic transition and expiration of data based on criteria. • Shall have GUI Web interface to manage multi-cloud environment. 2. In case vendor doesn't support above features natively then vendor shall provision the complete cloud automation suite in their bid and shall provide the complete documentation in the bid.	
35.	Node failures	Object storage should withstand minimum two node or 25% percent of total node (whichever is higher) failures without data loss.	
36.	Disk Failures	Object storage should withstand minimum four disk failures without data loss.	
37.	Cables	Necessary compatible power, network, fiber cables with required length to be supplied along with storage.	
38.	Core technology - Object	1. Offered Object storage core technology shall be able to abstract the underlying servers, to create a uniformly scalable storage pool 2. There shall be No size limit for object or files which can be stored in the cluster. 3. Offered storage shall do automatic Rebalancing	

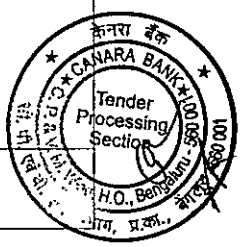
		when adding a new server in the cluster 4. Offered storage shall allow capacity extensions done by adding disks to existing servers (scale-up) or adding additional servers to the system (scale-out).	
39.	Peer to peer connectivity	1. Any change in the connecting topology, like adding the nodes, shall broadcast the change to few/all nodes in the cluster. 2. Overall cluster shall provide the self-healing processes to monitor and automatically resolve component failures using re-build, proxy and rebalance aspects.	

Table-H

Storage Technical Specifications: (Enterprise Block Storage 2.0PB Usable Space: DC -2, DRC - 2)

Sl. No.	Particulars	Detailed Configuration	Bidder's Compliance (Yes/No)
1.	Make	Bidders to specify	
2.	Model	Bidders to specify	
3.	Form Factor	Bidders to specify	
4.	Power Factor	Bidder to specify	
5.	Architecture	Controllers shall be active-active so that all volumes are automatically load balanced without needing administrative intervention for manual balancing of workloads/volumes.	
6.	Type	NVMe based SSD	
7.	Memory & Cache	Minimum 512 GB Cache per controller , Cache should be dynamically allocated for reads and writes without any fixed allocation.	
8.	Capacity	Minimum usable storage 2 PB after RAID6 or Dual RAID6 Configuration. (Without considering any data reduction features such as compression, deduplication etc .)	
9.	Drives	2.5" to 3.5" drives	
10.	Hard Disk Capacity	Each hard disk Capacity should not be less than 15 TB and not more than 20 TB	
11.	Scalability	Each storage up to 4PB(Scale UP) and 4 Controllers (Scale Out) DIP(data in-place) upgrade capability. All disk should be accessible to all the controllers.	

12.	Performance	Capable of delivering sustained minimum 10GB/s throughput and 5,00,000 IOPS in (read: write) (70:30) ratio with microsecond response time. Taking the 16kb block size into consideration for above throughput.	
13.	RAID Support	RAID array supporting raid6/Dual raid / better levels. It should support a mix and match of RAID levels behind a pair of controllers. The storage array should allow online expansion of existing RAID Groups / Storage Disk Pools.	
14.	Encryption	should have native encryption capabilities as per PCI DSS standards and encryption should not add any performance overheads	
15.	Backup	During power failure, Data in the cache should be safely written to the disks prior to performing a graceful shutdown. Data loss in storage should be zero due to any issues noticed in the Datacenter or any natural calamities.	
16.	Services	Proposed storage array should include storage based Thin Provisioning, compression, inline Deduplication Synchronous-Asynchronous Replication, Snapshot, and Volume cloning features for the entire supported capacity of the storage array from day one. All the required or necessary licenses must be perpetual and provided for the Full capacity of each storage from Day one. This should include licenses for Management and monitoring module and all the storage features such as Snapshot, Cloning, Sync and Async Replication etc. Upgrade in capacity should not incur any additional license cost Offered Storage management console shall be able to manage multiple arrays from a single console is preferred. Management console shall provide following functionalities: Offered storage system have online and historical performance reporting capability. At least 1 year of historical performance information should be available online for capacity and performance forecasting, trend analysis etc. In case this capability is not available natively, then necessary software subscription shall be provided for the entire duration of the contract.	
17.	Protocol Support	Fiber Channel & iSCSI	



18.	Operating System Support	Support for multiple Operating Systems versions connecting to it, including but not restricted to Windows 2019,2022 or later, UNIX (AIX & Solaris & HP Unix), Linux (Red hat, SUSE & OEL), Red Hat OpenShift Container Platform Plus, Hypervisor (vSphere, Hyper V, Red hat Virtualization, Oracle virtualization) Support for multiple hardware environment but not limited to X86 machines and IBM power machines	
19.	Ports	Minimum 16 number of FC Ports of 32/64 Gbps each (SAN), Minimum 4 Number of 10/25 Gbps for IP Traffic (iSCSI) and 2 Number of 10/25 Gbps for Replication (Network).Minimum two management Ports of 1Gbps. Storage should support FC-NVMe: 32Gb/s	
20.	Warranty and Support	3 Years, Comprehensive, On-Site Support Warranty and 2 years AMC including part replacement /repairs within 6 hours of reporting, and Software support for updates, upgrades, patches, and bug fixes for supplied s/w from OEM 24 x 7 x 365 days. In case of Disk failure, the faulty disk will be destroyed/ degaussed on replacement. Proactive storage monitoring & support from OEM should be enabled. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS during the warranty and AMC period.	
21.	Other Features	The proposed storage system should support SNMP, Address resolution protocol, Network Time Protocol, LDAP. The Storage array should be licensed and Performance monitoring tools should be offered with the storage array. The proposed storage system shall support a browser-based GUI built in management. The proposed storage should able to create multiple array pools so that same storage can be used for server virtualization and for database pools.	
22.	Uptime	The storage should be able to provide availability parameter of 99.99% from the date of acceptance of the Storage by Bank	
23.	Power Supply	Storage should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified.	

24.	No Single point of Failure	Offered Storage Array should be based on a No Single Point of Failure (NSPOF) architecture with complete redundancy of controllers, power, cooling, etc.	
25.	Global Hot Spare	Offered Storage Array shall support distributed Global hot Spare capacity for offered Disk drives.	
26.	Software	Management software must include both GUI and CLI tools. Management of the storage system should be through single management tool. The GUI must be able to configure all features, monitor the status and health of the storage system. If licensed, separately, the vendor needs to provide necessary licenses for full capacity. Vendor should provide storage array management software for configuration, administration and monitoring. Vendor shall offer the enterprise version of the software if there are multiple versions of the software. Software shall be able to manage all arrays of the same family. The performance monitoring should be real-time and historical providing IOPS response time and utilization of individual components within the storage array. Log Maintenance facility should be available. Storage should be compatible to integrate with Bank monitoring tool	
27.	Remote Replication	Offered Storage array should provide both Synchronous and Asynchronous replication across 2 storage arrays natively. Offered Storage array shall support 2 Data Center solution natively where Primary site shall be able to replicate synchronously to near-by / replicate to Far location asynchronously. Necessary replication licenses/Infrastructure required for replication should be provided with the array	
28.	End of Sale & End of Support	The proposed Hardware and Software generation should be latest from the date of RFP submission and the proposed Hardware and Software should not become End of Sales for Three years from the date of delivery of hardware & End of support for 6 years from the date of delivery of hardware	
29.	Controller & Availability	Storage should have minimum two active controllers, hot swappable controllers for high availability, load balancing and redundant modes. Offered Storage array should be an enterprise class	

		storage system with **99.9999%** Data Availability guarantee. The offered array should be an end-to-end NVMe storage system and capable of supporting NVMeoF over Fibre Channel for Hosts. Controllers shall be active-active so that all volumes are automatically load balanced without needing administrative intervention for manual balancing of workloads/volumes.	
30.	Quality of service	Offered storage array shall support quality of service for critical applications so that response time requirements can be defined for specific applications / LUNS. Quality of service feature should allow definition of minimum and maximum cap for required IOPS / bandwidth for a given volume or set of volumes.	
31.	Capacity Efficiency features	Offered storage array should support thin provisioning It should also support inline data reduction (deduplication & compression) for maximizing flash storage capacity **The array should offer the flexibility to enable / disable the data reduction on Global level or any other granular.**	
32.	Snapshots / Point in time copies	The storage array should have support for controller-based snapshots (At-least 128 copies for a given volume). The snapshots should be capable of being designated either as Read Only or Read/Write as required	
33.	Multipathing	Multipathing across two controllers. Data path should work consistently on active-active and NOT in hot standby. All LUNs should have visibility through all controllers and data flow should happened through them.	

Table-I

Technical Specification of 27 server racks (19 Nos at DC - Single Phase, 8 Three Phase)

Sl. No.	Particulars	Detailed Configuration(DC)	Bidder's Compliance Yes/No
1.	Make	Bidders to specify	

2.	Model	Bidders to specify	
3.	Power Factor	PDU Single Phase with 63A Server rack mount power distribution unit 1Ph,230V,63A 50/60Hz with redundancy. PDU Three Phase with 32A Server rack mount power distribution unit 3Ph,440V,32A 50/60Hz with redundancy.	
4.	Form Factor	42 U Rack Frame with all necessary side panels	
5.	Colour	Black Colour	
6.	Wheels	Rack wheels for rack movement	
7.	Rack Size	600 mm*1200mm *2100mm (600mm - Width , 1200mm Depth , 2100mm Height)	
8.	Lock Mechanism	Mechanical lock with key for both front and back door	
9.	PDU Socket details	Zero U standard with minimum 20 x C13 (20 power sockets with C13 type) and minimum 4 x C19 (4 power socket with C19 type) Per PDU Dual PDU should be made available for each rack	
10.	Over load protection MCB	PDU rating approximate 14KVA per PDU for single phase with 63A (4 MCB) PDU rating approximate 22KVA per PDU for Three phase with 32A (6 MCB)	
11.	Bottom feed	Minimum 3 Meters IEC 309 input plug top	
12.	Others	Levelers Required Ganging kits and necessary tool for mounting PDU with side doors and necessary Cable organizer. Adjustable screw legs - 4 No. Rack filler to be provided upto half rack size.	
13.	Fan	fans on the top side of rack (desirable)	
14.	Compatibility	Rack should be compatible to mount all the hardware's supplied in this RFP	
15.	Cable Loops	Minimum Eight cable loops to be provided per rack for cable dressing	
16.	Certification	UL certified	

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17.	Mounting	The bidder shall have to mount new as well as existing servers and other devices in the rack and will have to provide the rack mounting kit accordingly	
18.	Grounding	Copper based Electrical Grounding / Earthing Strip	

Table-J

Technical Specification of server racks (23 Nos with three phase at DR)

Sl. No.	Particulars	Detailed Configuration(DR)	Bidder's Compliance Yes/No
1.	Make	Bidders to specify	
2.	Model	Bidders to specify	
3.	Power Factor	PDU Three Phase with 32A Server rack mount power distribution unit 3Ph,230V,32A 50/60Hz with redundancy.	
4.	Form Factor	45 U Rack Frame with all necessary side panels	
5.	Colour	Black Colour	
6.	Wheels	Rack wheels for rack movement	
7.	Rack Size	600 mm*1200mm (600mm - Width , 1200mm Depth)	
8.	Lock Mechanism	Mechanical lock with key for both front and back door	
9.	PDU Socket details	Zero U standard with minimum 20 x C13 (20 power sockets with C13 type) and minimum 4 x C19 (4 power socket with C19 type) Per PDU. Dual PDU should be available for each rack.	
10.	Over load protection MCB	16A MCB X 2 circuits - PDU rating approximate 8KVA	
11.	Bottom feed	Minimum 3 Meters IEC 309 input plug top	
12.	Others	Levelers Required Ganging kits and necessary tool for mounting PDU with side doors and necessary Cable organizer. Rack filler to be provided upto half rack size.	
13.	Fan	fans on the top side of rack (desirable)	
14.	Compatibility	Rack should be compatible to mount all the hardware's supplied in this RFP	

15.	Cable Loops	Minimum Eight cable loops to be provided per rack for cable dressing	
16.	Certification	UL certified	
17.	Mounting	The bidder shall have to mount new as well as existing servers and other devices in the rack and will have to provide the rack mounting kit accordingly	
18.	Grounding	Copper based Electrical Grounding / Earthing Strip	

Table-K

Technical Specification of Network TOR Switches

Sl. No.	DC and DRC Switch Technical Specification:	Compliance(Y/N)
A	**Type 1 Switch - 14 numbers (07 numbers in DC and 07 numbers in DRC) - Mgmt.**	
1.	Switch must have 48 Gig Ethernet ports and 2 x 10G SFP+ for uplink on single chassis.	
2.	Switching capacity should be equal to greater than 100 Gbps.	
3.	Mac address table size should be equal to greater than 16000.	
4.	Switch must be supplied with compatible Trans receiver for Fiber ports and should be from same OEM.	
5.	Switch must have redundant Power Supply.	
6.	Switch should have USB/Ethernet management interfaces.	
7.	Switch should have minimum Flash memory 128 Mb.	
8.	Switch should have minimum DRAM 512 Mb.	
9.	Switch should be managed in an IPv6 network(IPv6 Device IP)	
10.	Switch should support Dual stack (IPv4 and IPv6) transitions from IPv4 to IPv6, support connectivity for both protocols	
11.	Switches should support Spanning Tree Protocol (STP)	
12.	Switch should support link aggregation control protocol (LACP) and port trunking.	
13.	Switch should support VLAN support and tagging support IEEE 802.1Q.	
14.	Switch should support Simple Network Management Protocol (SNMPv2 and SNMPv3).	
15.	Implement Access Lists on the switch to ensure SNMP access only to the SNMP manager or the NMS workstation.	
16.	Switch should support duplicates port traffic (ingress and egress) to a local or remote monitoring port.	
17.	Implementation of multiple Privilege Levels should be supported.	
18.	Switch should Support for authentication, authorization, and accounting (AAA) using RADIUS and TACACS+.	
19.	Switch should support FTP, TFTP, and SFTP.	

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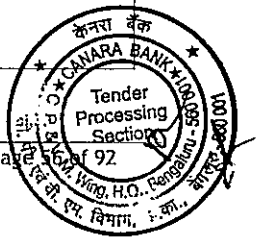
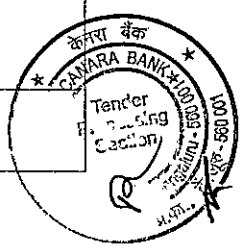
20.	Switch should support Extensive debugging capabilities to assist in hardware/Configuration problem resolution, should supports ping and traceroute for both IPv4 and IPv6.	
21.	Switch should support integration for Network Time Protocol (NTP), SIEM.	
22.	The Switch must be able to generate Syslog Messages with timestamp, which can be exported to a Syslog Server.	
23.	The Switch shall integrate with centralized network management software.	
24.	The Switches must be supplied with Compatible Power cables for the PDU supplied with the rack.	
25.	The switch shall have management security features like SSHv2 / Secure copy, encrypted user passwords, and authentication via AAA and RADIUS / TACACS+ to prevent unauthorized management access"	
26.	Switch should have Custom banner display.	
27.	Proposed Switches must integrate seamlessly with active - active ports for redundancy and high availability from two core/distributed switches from day one with our existing infrastructure of Cisco/Juniper Datacenter router/switches.	
28.	24*7*365 days Technical support with response time of 30 minutes.	
29.	Four hours RMA support in case of any hardware failure.	
B.	Type 2 Switch - 24 numbers (12 DC+ 12 DRC) for Data	Compliance(Y/N)
1.	Switch must be Data Center grade switch. Switch should be configurable/deployable with other switches to utilize all available links through multi-path forwarding.	
2.	Switch must have 48 fixed 10-G BASE-T ports	
3.	6 fixed 40/100-Gbps QSFP+ ports for uplink connectivity with fully populated trans receivers on single chassis.	
4.	48 downlink ports should be configured to work as 1 & 10Gbps.	
5.	Switch should support EVPN and Virtual Extensible LAN (VXLAN) to create Fabric. Fabric should be capable to integrate with SDDC like Open stack, VMWare etc. Switch should support In Service Software Upgrade.	
6.	Switch throughput should be more than equal to 1 bpps.	
7.	Latency should be less than 2.3 microsecond.	
8.	Mac address table size should be equal to greater than 2 lakhs.	
9.	Switch should support more than 4000 Vlans.	
10.	Switch must be supplied with compatible Trans receiver for all Optical/Fiber ports and should be from same OEM.	
11.	Switch must have redundant Fan and Power Supply.	
12.	Switch should provide flexibility for 10GbE top-of-rack deployment.	
13.	Switch should have USB/Ethernet management interfaces.	
14.	Switch should be managed in an IPv6 network(IPv6 Device IP)	

15.	Switch should support Dual stack (IPv4 and IPv6) transitions from IPv4 to IPv6, support connectivity for both protocols	
16.	Switches should support Spanning Tree Protocol (STP)	
17.	Switch should support link aggregation control protocol (LACP) and port trunking IEEE 802.1AX-2008.	
18.	Switch should support VLAN support and tagging support IEEE 802.1Q.	
19.	Router should support Simple Network Management Protocol (SNMPv2 and SNMPv3).	
20.	Implement Access Lists on the switch to ensure SNMP access only to the SNMP manager or the NMS workstation.	
21.	Switch should support duplicates port traffic (ingress and egress) to a local or remote monitoring port.	
22.	Implementation of multiple Privilege Levels should be supported.	
23.	Switch should Support for authentication, authorization, and accounting (AAA) using RADIUS and TACACS+.	
24.	Switch should support FTP, TFTP, and SFTP.	
25.	Switch should support Extensive debugging capabilities to assist in hardware/Configuration problem resolution, should supports ping and traceroute for both IPv4 and IPv6.	
26.	Switch should support integration for Network Time Protocol (NTP), SIEM.	
27.	The Switch must be able to generate Syslog Messages with timestamp, which can be exported to a Syslog Server.	
28.	The Switch shall integrate with centralized network management software.	
29.	The Switches must be supplied with Compatible Power cables for the PDU supplied with the rack.	
30.	The switch shall have management security features like SSHv2 / Secure copy, encrypted user passwords, and authentication via AAA and RADIUS / TACACS+ to prevent unauthorized management access"	
31.	Proposed Switches must integrate seamlessly with active - active ports for redundancy and high availability from two core/distributed switches from day one with our existing infrastructure of Cisco/Juniper Datacenter router/switches.	
32.	Switch should have Custom banner display.	
33.	High Mean Time Between Failure values (>2 Lakh hours) should be available to ensure long life of switch hardware.	
34.	24*7*365 days Technical support with response time of 30 minutes.	
35.	Four hours RMA support in case of any hardware failure.	
C.	**Type 4 Switch - 4 numbers (2 DC+ 2 DRC) - Storage**	**Compliance(Y/N)**
1.	Switch must be Data Center grade switch. Switch should be configurable/deployable with other switches to utilize all available links through multi-path forwarding.	



2.	Switch must have 48 x 25-Gbps fiber downlink ports and 6 x 100-Gbps Quad Small Form-Factor Pluggable 28 (QSFP28) uplink ports with fully populated trans receivers on single chassis.	
3.	48 downlink ports should be configured to work as 25 Gbps.	
4.	Switch should support EVPN and Virtual Extensible LAN (VXLAN) to create Fabric. Fabric should be capable to integrate with SDDC like Open stack, VMWare etc. Switch should support In Service Software Upgrade.	
5.	Switch throughput should be more than equal to 2 bpps.	
6.	Latency should be less than 1 microsecond.	
7.	Mac address table size should be equal to greater than 2 lakhs.	
8.	Switch should support more than 4000 Vlans.	
9.	Switch must be supplied with compatible Trans receiver for all Fiber ports and should be from same OEM.	
10.	Switch must have redundant Fan and Power Supply.	
11.	Switch should provide flexibility for 25GbE top-of-rack deployment.	
12.	Switch should have USB/Ethernet management interfaces.	
13.	Switch should be managed in an IPv6 network(IPv6 Device IP)	
14.	Switch should support Dual stack (IPv4 and IPv6) transitions from IPv4 to IPv6, support connectivity for both protocols	
15.	Switches should support creation of one virtual resilient switch from up to two switches by using standard LACP for automatic load balancing and high availability or by other equivalent method.	
16.	Switches should support Spanning Tree Protocol (STP)	
17.	Switch should support link aggregation control protocol (LACP) and port trunking IEEE 802.1AX-2008.	
18.	Switch should support VLAN support and tagging support IEEE 802.1Q.	
19.	Switch should support Simple Network Management Protocol (SNMPv2 and SNMPv3).	
20.	Implement Access Lists on the switch to ensure SNMP access only to the SNMP manager or the NMS workstation.	
21.	Switch should support duplicates port traffic (ingress and egress) to a local or remote monitoring port.	
22.	Implementation of multiple Privilege Levels should be supported.	
23.	Switch should Support for authentication, authorization, and accounting (AAA) using RADIUS and TACACS+.	
24.	Switch should support FTP, TFTP, and SFTP.	
25.	Switch should support Extensive debugging capabilities to assist in hardware/Configuration problem resolution, should supports ping and traceroute for both IPv4 and IPv6.	
26.	Switch should support integrate Network Time Protocol (NTP), SIEM	



27.	The Switch must be able to generate Syslog Messages with timestamp, which can be exported to a Syslog Server.	
28.	The Switch shall integrate with centralized network management software.	
29.	The Switches must be supplied with Compatible Power cables for the PDU supplied with the rack.	
30.	The switch shall have management security features like SSHv2 / Secure copy, encrypted user passwords, and authentication via AAA and RADIUS / TACACS+ to prevent unauthorized management access"	
31.	Proposed Switches must integrate seamlessly with active - active ports for redundancy and high availability from two core/distributed switches from day one with our existing infrastructure of Cisco/Juniper Datacenter router/switches.	
32.	Switch should have Custom banner display.	
33.	High Mean Time Between Failure values (>2 Lakh hours)should be available to ensure long life of switch hardware.	
34.	24*7*365 days Technical support with response time of 30 minutes.	
35.	Four hours RMA support in case of any hardware failure.	

Below table to be consider to provide uplink for above access switches as minimum cabling requirement.

Fiber(OM4)		
Length	DRC Qty	DC Qty
30M	40	25
20M	15	
15M		25
10M	20	25

In addition to the above access switches Bidder to supply Distribution Switches in High availability with required capacity to connect all supplied access switches with dual uplink of 10/40/100 Gbps in active-active mode for redundancy and load sharing (DC - (MZ-2,DMZ-2, DRC - (MZ-2,DMZ-2)) , Also Distributed Switch must be supplied with compatible Transceiver for Fiber ports and should be from same OEM with redundant power supply

Table-L

Backup Software for 500 Servers at DC and DRC

Sl. No.	Detailed Configuration-Backup Software	Bidder's Compliance (Yes/No)
1.	Make - Bidders to specify	

2.	Backup Software version - Bidders to specify	
3.	Backup Management Software should support backup of Physical, Virtual and Micro services (container) environments	
4.	Backup software should support agent/agentless backups of applications residing in VMs like SQL, Exchange, SharePoint, Oracle, etc. with non-staged granular recovery of all these applications. It should support crash consistent VM level backup for all other workloads	
5.	Backup software should be a Hardware Agnostic software and it should support snapshot integration with hypervisors like VMware and Hyper-V and support de-duplication on any storage target. It should be able to backup data to tapes (like LTO) as well for long term retention..	
6.	The proposed Backup software must offer instance based licenses with no restrictions on type of arrays (protecting heterogeneous storage technologies), front end production capacity or backup to disk target capacity restrictions. Licenses and associated software should be supplied for both primary and DR site.	
7.	Required License should be supplied to protect virtual machines, physical servers, NAS workload, Endpoints and multi cloud workload including all database applications running on these platforms	
8.	Backup software should have Capability to do trend analysis for capacity planning of backup environment, extensive alerting and reporting with pre-configured and customizable formats. Any specialized reporting modules needed must be quoted along with associated hardware to achieve this functionality. All necessary hardware resources required to run this module should be supplied.	
9.	Proposed **software** should support 24x7 real-time monitoring, with at-a-glance and drill-down views of backup items to check the backup status like backup size, backup files count, backup servers count, backup timings , number of times backed up etc.,	
10.	Backup software should provide Backup and Replication capabilities in one console only and also allow users to integrate with RBAC capabilities of the hypervisor, so that users can initiate backup and restore only those VMs to which they have access, without administrator intervention, thereby delivering self-serve capabilities.	
11.	Proposed **software** should support automated action for popular alarms (automated or semi-automated), with at-a-glance and drill-down view (e.g., Backup failed alerts with details of its failure)	
12.	The proposed backup software should be capable to take backups on object storage.	

13.	The Proposed backup software should not have any limitation on the number of incremental backups that could be taken post a Full backup.	
14.	Backup software should support instant file share recovery in NAS storages to allow users to access files fast after disaster. Backup software should support instant VM and NAS recoveries.	
15.	Proposed backup software should have the ability to perform staged restores to enable admins to comply to regulations by selectively deleting files / records which should not be restored from the backup copies. This will help in complying to "right to be forgotten "regulations like GDPR, where user data is deleted from restored backup copies in an auditable manner. Backup software should secure the system from eavesdropping of staged data as well as by prohibiting any deletions/modifications to backup copies.	
16.	Backup Software should be able to extend the backup repository to a public cloud service provider by moving older files to any S3 Compatible Object storage or Azure BLOB repositories. The Backup Software should support copying of data directly into all industrial standard object storages like ECS,HCP,SCALITY etc.,	
17.	The software must has the functionality to back up on-prem data directly into cloud repositories such as AWS S3 or Microsoft Blob.	
18.	The proposed backup software should have approval flow for any backup deletion.	
19.	The Proposed backup Software should support Syslog and Service Now integration.	
20.	Recovery verification should include bare metal restore of server from backup and should have capability to verify and validate the integrity of the data. Also publish automated reports to be used in backup / recovery audits.	
21.	Backup software should support Multi factor authentication for accessing Backup console and console auto log-off functionality.	
22.	The proposed backup software should have a native solution to protect Kubernetes/Container workloads; without the need of a 3rd party solution.	
23.	The proposed backup software should provide Instant recoveries for any backup to VMware or Hyper-V Virtual machine	
24.	Backup software must have a feature of data validation, whereby a workload (VM with OS and application) is powered-on in a sandbox environment and tested for its recoverability	
25.	Backup software should support file level recovery from any backup of any VM.	
26.	**Container Environment**	
	Offered backup software should support/ open integration multiple kubernetes distributions including RHOS, VMware Tanzu, SUSE Rancher, Ezmeral Runtime etc.	

27.	Proposed backup software should be scalable to any number of worker nodes	
28.	Backup software should have the ability to take application consistent backup at granular level for micro-services	
29.	It should support integration with relational and no-sql databases.	
30.	Proposed software should have cloud storage integration	
31.	Proposed software have role base access control on the backup server	
32.	The offered **software** should support policy based backup architecture with calendar/frequency based scheduling.	
33.	Should preferably support auto-discovery of applications needing protection and provide alerting capability	
34.	Should support CSI integration and leverage underlying storage capabilities such as snapshots and replication of leading storage vendors including Dell EMC, HPE, Hitachi etc. Compatibility list to be provided	
35.	The proposed Backup software should protect from ransomeware attacks	
36.	Should provide both GUI (dashboard) access as well as CLI using kubectl APIs.	
37.	Should support multiple independent k8s clusters	
38.	Backup software should support immutable backups for protecting backups from ransomware and malicious attacks. The immutability should be controllable from the backup management specification itself.	
39.	The backup software should have native storage integrations with all leading Storage platforms from Dell EMC, HPE, IBM, Hitachi, Netapp etc.	
40.	The backup software should support multiple types of backup repositories including Purpose built backup alliances, S3 Object Storage, Hardened NFS repositories etc. Compatibility list to be provided.	
41.	Backup software should be compatible with backup target types - VTL & NAS (NFS & CIFS).	
42.	Backup software shall have the ability to configure multiple Tape Libraries & NAS targets.	
43.	The proposed Software generation should be latest version the date of RFP submission and the proposed Software should not become End of Sales for three years from the date of the submission of the RFP and End of Life for 6 years from the date of the submission of the RFP	

Table-M

Technical Specification of Managed file transfer Solution:

Sl. No.	Detailed Specification	Compliance(Y/N)
1.	The proposed solution should be On-Premise deployment in three tier architecture DMZ secure gateway that allows files to be shared without being stored in the DMZ. The Gateway should be coordinate with the MFT to exchange secure data with the external SFTP Client	
2.	The proposed solution must centrally manage all file transfers in a secure manner.	
3.	The MFT solution should support FTP, FTP/S, SSH/SFTP, SSH/SCP, HTPPS and should have capability to support, AS1,AS2,AS3 etc. for future requirements.	
4.	The proposed solution should provide strong file encryption mechanism to encrypt data at rest and in transit	
5.	The solution should also provide a Web browser-based interface that enables users to upload/download files.	
6.	Users should view recent activity and status for file transfers they participated in, Generate reports for activity they participated in, Change their password, Subscribe to notifications.	
7.	The proposed solution should be able to support multiple file transfer job simultaneously	
8.	The proposed solution should provide a mechanism to allow external and internal entities to participate in file transfers within the same centralized server system.	
9.	The proposed solution should support automated file transfer job.	
10.	The proposed solution should be capable of sending alerts for failed task job to respective job owner	
11.	The software should support predefining the business processes for common behaviors in file-transfer scenarios, reducing the need for customization	
12.	The proposed solution should allow downloading a file multiple times.	
13.	The proposed solution should be able to restrict the file transfer based on file extension, IP, file size, header body parameter validation.	
14.	The proposed solution should support manual intervention of file retention timelines, business process retentions.	
15.	The proposed solution should provide inbuilt authentication options, including IP address, user ID and password, digital certificates, SSH keys.	
16.	The proposed solution should have mechanism to configure different password policies for external entities within the same solution	

17.	All SFTP users passwords should have option to change their password on their own as and when needed or when password expires as per policy	
18.	The proposed solution should have time based access control for external entities	
19.	The proposed solution should be able to provide successful access audit, failed access, configuration change logs, end to end transaction monitoring and troubleshooting.	
20.	The proposed solution should be able to allow blacklisting of IP's basis region, Set of IP's	
21.	The proposed solution should have capability to keep transaction/log data separate from the file system data. It should have also capability to store file system, transaction DB on the cloud.	
22.	The proposed solution should be able to terminate the session while the user is inactive for predefined time.	
23.	The proposed solution should prevent direct communications between external and internal sessions by establishing secure session breaks in the DMZ using SSL or TLS encryption	
24.	The proposed solution should support configuring data retention policy for at least 6 months.	
25.	The software should allow to automate purge or archive files.	
26.	The proposed solution should have support of Peer to Peer (Point to Point) deployments	
27.	The proposed solution should support all major industry operating systems (Windows, Linux, AIX, Solaris) and hardware (X-86 & Power, IBM Z, HP-UX)	
28.	The proposed solutions should allow addition of infrastructure/hardware to support higher usage for future requirement.	
29.	The proposed solution should provide embedded database and should also support and option to deploy it on oracle DB.	
30.	The proposed solution should have a separate dashboard to monitor real time file transfer jobs, alerts, warnings.	
31.	The proposed solution should provide proactive notification for at-risk business processes in the form of emails, SNMP traps, and alerts	
32.	The proposed solution should allow to configure email to send schedule compliance reports.	
33.	The proposed solution should be support MFA (Multi Factor Authentication) solution.	
34.	<u>The Proposed solution should have inbuilt mechanism to validate external entities using multiple authentication</u>	

	methods. Upon successful authentication, external users should be granted access to the green zone	
35.	The proposed solution should support high available architecture/deployments link Active-Active, Active-Passive.	
36.	The proposed solution should not restrict adding user as and when required.	
37.	The solution should support oracle DB or equivalent for transactional/ logs as well as file system database.	
38.	The solution should support deploying HA at DR and DC-DR architecture	
39.	The proposed solution should support sending file in encryption form and should have an option receive it encrypted or decrypted at the destination.	
40.	The proposed solution should allow user to send a file to multiple users in different protocols at a same time.	
41.	The solution should provide option to integrate with existing antivirus to scan file before it enters internal/ green zone.	
42.	Application should have a capability to transfer file at multiple locations at the same time.	
43.	Required license to run in active- active setup and for entire solution of total 16 coreto be supplied.	
44.	The solution should possess the capability to seamlessly integrate with Active Directory	
45.	The solution should support sharing of files with all file extensions and sizes, ensuring versatility and flexibility for users' needs.	
46.	The solution should possess the capability to create shared folders for each group, department, or team, with customizable access levels and storage size restrictions.	
47.	Users should have the ability to securely send files to recipients by generating a link and then emailing the link to the intended receiver.	
48.	The solution should be capable of supporting both on-premises and cloud storage repositories, offering flexibility and compatibility with various storage environments. The solution should support any brand and models of storage and hardware.	
49.	The solution should support automated data cleanup based on specified criteria such as number of days.	
50.	The solution should include comprehensive audit logging capabilities, capturing all activities such as data upload, share, download, cut, copy, paste, and rename. These logs must be stored in a non-tamperable format to ensure the integrity and reliability of the recorded information for compliance and security purposes.	
51.	The solution should allow for customizable validity periods for shared links based on specific dates and times. This feature	

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	enables administrators or users to set expiration dates and times for shared links, ensuring that access is limited to the desired timeframe.	
52.	The solution should offer command-line support, enabling seamless integration with external workflows and automation processes.	

Table-N

Technical Specifications of 4 SAN Director (2 Nos at DC and 2 Nos at DR)

Sl. No.	Detailed Configuration	Specification	Bidder's compliance (Yes/No)
1.	Bidder to specify make		
2.	Bidder to specify model		
3.	Bidder to specify form factor		
4.	Bidder to specify the power factor		
5.	SAN Director should be configured with minimum 3Blades*48 ports= 144 FC SAN ports with populated 32Gbps SFP Transceiver Modules and should be negotiable speed with 16/32 Gbps. SAN Director should support 64GBps trans receiver compatibility for future upgrade		
6.	Scalable further with 48 port*5 blades =240 FC SAN ports.		
7.	SAN director should have Dual Controllers		
8.	The switch should have 3Tbps BW per port blade providing line rate performance with 64G Line card in every Slot.		
9.	The switch should support 512 Gbps BW for ISL Trunking Necessary Licenses to be provided by the bidder.		
10.	The switch should auto-negotiate with 64/32/16 Gbps FC speed		
11.	Switch should support multiprotocol architecture such as FC, FICON, FCIP and FCR		

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	Support for multiple Operating Systems versions connecting to it, including but not restricted to Windows 2016 or later, UNIX (AIX & Solaris & HP Unix), Linux (Red hat, SUSE & OEL), Hypervisor (vSphere, Hyper V , Red hat Virtualization, Oracle virtualization & Nutanix),RHCOS. Support for multiple hardware environment but not limited to X86 machines and IBM power machines		
12.	Maintenance: <u>Should Support online upgrade of firmware and other components.</u>		
13.	Warranty and Support	3 Years, Comprehensive, On-Site Support Warranty and 2 Year AMC including part replacement /repairs within 6 hours of reporting, and Software support for updates, upgrades, patches, and bug fixes for supplied s/w from OEM 24 x 7 x 365 days. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS during the warranty and AMC period.	
14.	Uptime	The SAN Switch should be able to provide availability parameter of 99.90 % from the date of acceptance of the Storage by Bank	
15.	Power Supply	SAN Switch should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified	
16.	Cables	Necessary compatible power, network, Fiber cables with required length to be supplied along with storage.	
17.	Throughput	The aggregate backplane bandwidth of switch should be scalable more than 24Tbps	

		of Fiber channel throughput for fully populated director	
18.	No Single point of Failure	The switch should have No Single Point of Failure (SPOF) and all the components should be hot swappable without even scheduled down time.	
19.	Monitoring	The switch should have Real time performance monitoring reporting tool	
20.	Diagnostics	The switch should have support for POST & online diagnostics	
21.	Other Features		
		The switch should have capability to interface with host based adapters (HBA) of multiple OEM, supporting multiple Operating Systems	
		The switch should have support of all leading SAN / NAS disk arrays and tape libraries	
		The switch should have Inter Switch linking feature to connect two or more FC switches	
		The switch should have trunking capability. The required software license should be supplied with switch	
		The switch should Provide Adaptive Networking services such as Quality of Service (QoS)	
		The switch should have high availability feature with no performance degradation of switching operation even when one of the processor card fails	
		The Switch should have Analytics and telemetry capabilities within the Switch	
		The Information generated by SAN Analytics should include at least counters and indicators related to latency,	

		completion time, Outstanding I/Os, I/O block size etc.	
		The solution should be used to monitor storage traffic patterns for extended durations. This information should be used to profile the applications for their storage needs. Recommendation based on storage traffic patterns of the same application to other virtual machines or hosts should be provided for future expansion	
		The Analytics solution should provide performance metrics of the available LUNs to enhance the storage provisioning	
		The solution should have auditability It should be able to generate multiple performance and error metrics for the complete storage fabric using a holistic approach to perform audits in the storage infrastructure.	
		The Information generated by SAN Analytics should include at least counters and indicators related to latency, completion time, Outstanding I/O's, I/O block size etc.	
		FCIP interface should have compression feature	
		SAN Switches should support NVME/ NVME-oF	
		All the ports shall be activated on day one and all necessary licenses and SFP shall be provided	
		The Switches should be IPv4/IPv6 Compliant	
		Any SAN Switch level configuration required for integration of the storage	

		with any new applications in future to be carried out by the bidder during implementation and warranty and AMC period with no extra cost (as many times as may be required)	
		The switch should have following security features	
		Must have hardware & Software zoning	
		Centralized fabric management	
		Authentication protocol	
		RADIUS, SSH, SNMP	
		Port binding	
		The switch should support offline diagnostics, including electrical/optical loopback, link traffic/latency/distance including environmental monitoring, FCping and Pathinfo (FC traceroute), 256 bit encryption, compression, frame viewer, non-disruptive daemon restart, port mirroring	
		Switch should provide advanced zoning capabilities and allow health and performance monitoring capabilities. Support for web based management and should also support CLI	
		The director class switch should provide Inter Switch Link (ISL) for connecting multiple SAN Switches.	
		The director class switch should support non-disruptive Microcode/ firmware Upgrades and hot code activation.	
		It should be possible to isolate the high bandwidth data flows traffic to specific	

		ISLs/trunks by simply using Zoning.	
		Switch should support Virtual Fabrics feature that enables partitioning of a physical SAN into logical fabrics and isolation by application, business group, customer, or traffic type.	
		Switch should provide advanced zoning capabilities and allow health and performance monitoring capabilities. Support for web based management and should also support CLI.	
		Should support features 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.	
		It shall be possible to configure the switches with alerts based on threshold values for temperature, fan status, Power supply status, port status.	
		Switch shall support diagnostics features such as port mirroring, Syslog, Online system health, Port-level statistics etc.	
22.	Port Types	The switch shall support different port types such as U_Port, , F_Port, E_Port, SIM port, EX_Port, D_Port (Diagnostic Port) & M_Port (Mirror Port)	
23.	Firmware Upgrades	The director class switch should support non-disruptive Microcode/ firmware Upgrades and hot code activation.	

Table-O

Technical Specifications of 10 SAN Switch (6 Nos at DC and 4 Nos at DR)

Sl. No.	Detailed Configuration	Specification	Bidder's compliance (yes/No)
1.	Bidder to specify make		
2.	Bidder to specify model		
3.	Bidder to specify form factor		
4.	Bidder to specify the power factor		
5.	SAN Switch should be configured with minimum 96 FC SAN ports with populated 32Gbps SFP Transceiver Modules and should be negotiable speed with 16/32 Gbps- (DC -4, DR -4). SAN Switch should be configured with minimum 48 FC SAN ports with populated 32Gbps SFP Transceiver Modules out of which it should contain 8 longwave sfps in each switch and it should be negotiable speed with 16/32 Gbps - (DC - 2) ISL Trunking connectivity and Cut Thru/Store Forward Switching. Necessary Licenses to be provided by the bidder. SAN Switch should support 64GBps trans receiver compatibility for future upgrade		
6.	Operating System Support	Support for multiple Operating Systems versions connecting to it, including but not restricted to Windows 2016 or later, UNIX (AIX & Solaris & HP Unix), Linux (Redhat, SUSE & OEL), Hypervisor (vSphere, Hyper V, Redhat Virtualization, Oracle virtualization & Nutanix), RHCOS. Support for multiple hardware environment but not limited to X86 machines and IBM power machines	
7.	Maintenance	Should Support online upgrade of firmware and other components.	
8.	Warranty and Support	3 Years, Comprehensive, On-Site Support Warranty and 2 Year AMC including part replacement /repairs within 6 hours of reporting, and Software support for updates, upgrades, patches, and bug fixes for supplied s/w from OEM 24 x 7 x 365 days. The proposed bidder will need to	

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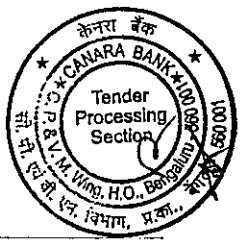
		ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS during the warranty and AMC period.	
9.	Uptime	The SAN Switch should be able to provide availability parameter of 99.90 % from the date of acceptance of the Storage by Bank	
10.	Power Supply	SAN Switch should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified.	
11.	Cables	Necessary compatible power, network, Fiber cables with required length to be supplied along with storage.	
12.	No Single point of Failure	The switch should have No Single Point of Failure (SPOF) and all the components should be hot swappable without even scheduled down time.	

Table-P

Technical Specifications of 2 LTO9 Tape Library (1 Nos at DC and 1Nos at DR) and 200 LTO7 & 3800 LTO8 & 800 LTO9 Tapes & 200 No. of LTO9 Cleaning Cartridge

Sl. No.	Detailed Configuration	Specification	Bidder's Compliance (Yes/No)
1.	Bidder to specify make		
2.	Bidder to specify model		
3.	Bidder to specify form factor		
4.	Bidder to specify power factor		
5.	Tape Drive	Minimum 40 LTO-9 Drive with FC Connectivity to support 8Gbps or more.	
6.	Free Slots	Minimum 250 Free tape slots should be available in library to accommodate the tapes.	
7.	Cables	Necessary OM3/OM4 FC cables of length 15 meters	



8.	LTO7 & LTO 8 & LTO 9 Tapes Up to LTO 9 Cleaning cartridges	3800 quantities (1900 DC & 1900 DRC) of LTO-8 standard tapes with custom Bar Codes compatible with the proposed Tape Library. 800 quantities (400 DC & 400 DRC) of LTO-9 standard tapes with custom Bar Codes compatible with the proposed Tape Library. 200 quantities (100 DC & 100 DRC) of LTO-7 standard tapes with custom Bar Codes.	
		200 quantities (100 DC & 100 DRC) up to LTO9 Cleaning Cartridge with custom Bar Codes. Tapes replacement warranty for defects in manufacturing and material defects for the full life of the product, or until end of support of the product	
9.	Warranty and Support	3 Years, Comprehensive, On-Site Support Warranty and 2 Years AMC including part replacement /repairs within 6 hours of reporting, and Software support for updates, upgrades, patches, and bug fixes for supplied s/w from OEM 24 x 7 x 365 days. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS during the warranty and AMC period.	Inte rl
10.	Uptime	The storage should be able to provide availability parameter of 99.0 % from the date of acceptance of the Storage by Bank	
11.	Power Supply	Storage should be provided with Redundant hot swappable Power supplies. The Power supplies should be FCC class A certified.	
12.	Cables	Necessary compatible power, network, fiber cables with required length to be supplied along with storage.	

Table-Q

Technical Specifications of 2 LTO9 standalone Tape Drive (1 DC and 1 DRC)

Sl. No.	Detailed Configuration	Specification	Bidder's Compliance
1.	Bidder to specify make		
2.	Bidder to specify model		
3.	Bidder to specify form factor		

4.	Bidder to specify power factor		
5.	Tape Drive	Minimum 8 Slots Autoloader with LTO9 FC drive to support 8Gbps or more	
6.	Cables	Necessary OM3/OM4 FC cables of length 15 meters	
7.	Warranty and Support	3 Years, Comprehensive, On-Site Support Warranty and 2 Years AMC including part replacement /repairs within 6 hours of reporting, and Software support for updates, upgrades, patches, and bug fixes for supplied s/w from OEM 24 x 7 x 365 days. The proposed bidder will need to ensure support of product & change of components @ zero cost in case of any part becoming obsolete/EOL & EOS during the warranty and AMC period.	
8.	Cables	Necessary compatible power, network, fiber cables with required length to be supplied along with storage.	

We comply with the above Technical and Functional requirements, Non-compliance to any of the above requirement will lead to disqualification of the bidder in Technical proposal.

Date:

Signature with Seal
Name:
Designation:

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Amended Annexure-16
Bill of Material

SUB: Supply, Installation, Configuration, Implementation and Maintenance of 500 Nos. of Servers and other IT Infra Components in Canara Bank

Ref: GEM/2024/B/4915191 dated 04/05/2024.

Notes

1. These details should be on the letter head of Bidder and each & every page should be signed by an Authorized Signatory with Name and Seal of the Company.
2. Please be guided by RFP terms, subsequent amendments and replies to pre-bid queries (if any) while quoting.
3. Do not change the structure of the format nor add any extra items.
4. No counter condition/assumption in response to commercial bid will be accepted. Bank has a right to reject such bid.

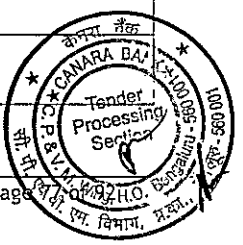
Table - A
Price details of Hardware Items

[Amount in Indian Rupees]

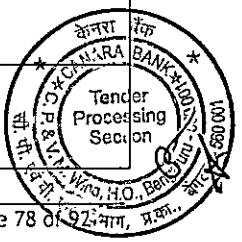
Sl. No.	Item Details	Unit Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Qty.	Total Cost Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Tax for Column c		Total Cost Price with Three years Comprehensive onsite warranty and support (Incl. of Taxes)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
1.	Servers With 64 core and approx. 2 TB Memory and Minimum 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)		80				
2.	Servers With 64 core and 512 GB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 as		28				

Sl. No.	Item Details	Unit Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Qty.	Total Cost Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Tax for Column c		Total Cost Price with Three years Comprehensive onsite warranty and support (Incl. of Taxes)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
	and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)						
3.	Servers With 32 core and 1 TB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable sace local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)		100				
4.	Servers With 32 core and 256GB Memory and 3.5 TB SSD Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)		54				
5.	Servers with 16 core and 512GB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)		226				
6.	Servers With 16 core and 256GB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable space		4				

Sl. No.	Item Details	Unit Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Qty.	Total Cost Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Tax for Column c		Total Cost Price with Three years Comprehensive onsite warranty and support (Incl. of Taxes)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
	local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)						
7.	Servers With 32 core and 1 TB Memory and 7.5 TB NVME SSD usable Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)		4				
8.	Servers With 32 core and 1 TB Memory and 34 TB NVME SSD usable Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)		4				
9.	Server Rack for placing Servers, storage, Library and SAN and Network switches and as per Technical Specification (Amended Annexure-9)		50				
10.	PDU for the supplied RACKS and as per Technical Specification (Amended Annexure-9)		100				
11.	SAN Director (48*3=144 FC SAN ports with 16&32Gbps SFP) and as		4				



Sl. No.	Item Details	Unit Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Qty.	Total Cost Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Tax for Column c		Total Cost Price with Three years Comprehensive onsite warranty and support (Incl. of Taxes)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
	per Technical Specification (Amended Annexure-9)						
12.	SAN Switches (32G SAN with 96 port) Switch and as per Technical Specification (Amended Annexure-9)		8				
13.	SAN Switches (32G SAN with 48 port) Switch and as per Technical Specification (Amended Annexure-9)		2				
14.	Object Storage of 2.5PB Usable Space and as per Technical Specification (Amended Annexure-9)		2				
15.	Enterprise Block Storage of 2.0PB Usable Space and as per Technical Specification (Amended Annexure-9)		4				
16.	Tape Library with 40 Tape Drives and 250 Free slots and as per Technical Specification (Amended Annexure-9)		2				
17.	LTO-9 Stand Alone Tape Drive and as per Technical Specification (Amended Annexure-9)		2				
18.	48 Gig Ethernet ports and 2 x 10G SFP+ for uplink on single chassis TOR Switch as per Technical		14				



Sl. No.	Item Details	Unit Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Qty.	Total Cost Price with Three years Comprehensive onsite warranty and support (Excl. of Taxes)	Tax for Column c		Total Cost Price with Three years Comprehensive onsite warranty and support (Incl. of Taxes)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
	Specification (Amended Annexure-9)						
19.	48 fixed 10-G BASE-T ports and 6 fixed 40/100-Gbps QSFP+ ports for uplink with fully populated transceivers connectivity on single chassis TOR switch as per Technical Specification (Amended Annexure-9)		24				
20.	48 x 25-Gbps fiber downlink ports and 6 x 100-Gbps Quad Small Form-Factor Pluggable 28 (QSFP28) uplink ports with fully populated transceivers on single chassis TOR Switch as per Technical Specification (Amended Annexure-9)		4				
21.	Distribution Switches in High availability with required capacity to connect all supplied access switches with dual uplink of 10/40/100 Gbps in active-active mode for redundancy and load sharing as per Technical Specification (Amended Annexure-9)		8				
22.	Total Cost for Hardware (Sum of Sl. No. 1 to 21)						

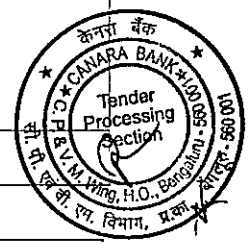


Table - B

Price details of Software/License Items (Perpetual)

[Amount in Indian Rupees]

Sl. No.	Item Details	Unit Cost with lifetime support (Excl. of Tax)	Qty.	Total Cost with lifetime support (Excl. of Tax)	Tax for Column c		Total Cost with lifetime support (Incl. of Tax)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
1.	Windows 2022 Data Centre Edition 16 Corepack with standard support		160				
2.	Windows 2022 Standard Centre Edition 16 Core pack with standard support		187				
3.	Microsoft SQL 2022 standard edition two core pack with standard support		156				
Sl. No.	Item Details	Unit Cost with first year support (Excl. of Tax)	Qty.	Total Cost with first year support (Excl. of Tax)	Tax for Column c		Total Cost with first year support (Incl. of Tax)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
4.	IBM WebSphere ND 9.5 PVU.		17920				
5.	Total Cost for Software/Licenses (Sum of Sl. No. 1 to 4)						

Table - C

Price details of Software/License Items (Subscription based Licenses)

[Amount in Indian Rupees]

Sl. No.	Item Details	Unit Price with support for 5 Years (Excl. of Tax)	Qty.	Total Cost with support for 5 Years (Excl. of Tax)	Tax for Column c		Total Cost with support for 5 Years (Incl. of Tax)
					% of Tax	Tax Amt.	

		a	B	c=a*b	d	e	f=c+e
1.	RHEL 9 Virtual DataCentre with premium support		20				
2.	RHEL 9 with premium support		150				
3.	RHEL 9 High Availability with premium support - X86 machines		30				
4.	RedHat OpenShift Container Platform Plus- RHCOS latest version subscription with premium support		3				
5.	RedHat OpenShift Container Platform Plus- RHCOS latest version subscription with standard support		3				
6.	Apache Tomcat Enterprise Edition with support - instance base		5				
7.	Managed File Transfer Solution core based		16				
8.	File Sync Software instance base with support		50				
9.	Backup Software instance based with support		500				
10.	Jboss Enterprise Application Platform (16 core Pack) with premium support		2				
11.	Jboss Enterprise Application Platform (16 core Pack) with standard support		1				
12.	Jboss web server (16 core Pack) with premium support		2				
13.	Jboss web server (16 core Pack) with standard support		1				
14.	**Total Cost (Sum of Sl. No. 1 to 13)**						

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Table - D

Price details of Linear Tape Open Cartridges (5000 nos.)

[Amount in Indian Rupees]

Sl. No.	Requirement Details	Unit Price (Excl. of Tax)	Quantity	Total Cost Price (Excl. of Tax)	Tax for Column C		Total Price (Incl. of Tax)
					% of Tax	Tax Amt.	
		a	b	c=a*b	d	e	f=c+e
1.	LTO-7 standard tapes with customized barcodes		200				
2.	LTO-8 standard tapes with customized barcodes		3800				
3.	LTO-9 standard tapes with customized barcodes		800				
4.	LTO-9 Cleaning Cartridges with customized barcodes		200				
5.	Total cost for 5000 Linear Tape Open Cartridges (Sum of Sl. No. 1 to 4)						

Table - E

AMC /ATS Cost for Hardware/Software/Licenses for 2 Years on post warranty

[Amount in Indian Rupees]

Sl. No.	Item Details	Cost for AMC for 2 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column d		Total AMC Cost (Incl. of Tax)
		4th Year	5th Year			% of Tax	Tax Amt.	
		a	b	C	d=(a+b)*c	e	f	g=(d+f)
A.	Hardware							
1.	Servers With 64 core and approx. 2 TB Memory and Minimum 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as			80				

Sl. No.	Item Details	Cost for AMC for 2 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column d		Total AMC Cost (Incl. of Tax)
		4th Year	5th Year			% of Tax	Tax Amt.	
		a	b	C	d=(a+b)*c	e	f	g=(d+f)
	mentioned in Tech Spec (Amended Annexure-9)							
2.	Servers With 64 core and 512 GB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 as and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)			28				
3.	Servers With 32 core and 1 TB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable sace local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)			100				
4.	Servers with 16 core and 512GB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)			226				
5.	Servers With 32 core and 256GB Memory and 3.5 TB SSD Local Disk with RAID 10 and minimum 900GB SSD usable space local			54				

Sl. No.	Item Details	Cost for AMC for 2 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column d		Total AMC Cost (Incl. of Tax)
		4th Year	5th Year			% of Tax	Tax Amt.	
		a	b	C	d=(a+b)*c	e	f	g=(d+f)
	Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)							
6.	Servers With 16 core and 256GB Memory and 3.5 TB SSD usable space Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)			4				
7.	Servers With 32 core and 1 TB Memory and 7.5 TB NVME SSD usable Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)			4				
8.	Servers With 32 core and 1 TB Memory and 34 TB NVME SSD usable Local Disk with RAID 10 and minimum 900GB SSD usable space local Disk with RAID1 as mentioned in Tech Spec (Amended Annexure-9)			4				
9.	Server Rack for placing Servers, storage, Library and SAN and Network switches and as per			50				

Sl. No.	Item Details	Cost for AMC for 2 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column d		Total AMC Cost (Incl. of Tax)
		4th Year	5th Year			% of Tax	Tax Amt.	
		a	b	C	d=(a+b)*c	e	f	g=(d+f)
	Technical Specification (Amended Annexure-9)							
10.	PDU for the supplied RACKS and as per Technical Specification (Amended Annexure-9)			100				
11.	SAN Director (48*3=144 FC SAN ports with 16&32Gbps SFP) and as per Technical Specification (Amended Annexure-9)			4				
12.	SAN Switches (32G SAN with 96 port) Switch and as per Technical Specification (Amended Annexure-9)			8				
13.	SAN Switches (32G SAN with 48 port) Switch and as per Technical Specification (Amended Annexure-9)			2				
14.	Object Storage of 2.5PB Usable Space and as per Technical Specification (Amended Annexure-9)			2				

Sl. No.	Item Details	Cost for AMC for 2 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column d		Total AMC Cost (Incl. of Tax)
		4th Year	5th Year			% of Tax	Tax Amt.	
		a	b	C	d=(a+b)*c	e	f	g=(d+f)
15.	Enterprise Block Storage of 2.0PB Usable Space and as per Technical Specification (Amended Annexure-9)			4				
16.	Tape Library with 40 Tape Drives and 250 Free slots and as per Technical Specification (Amended Annexure-9)			2				
17.	LTO-9 Stand Alone Tape Drive and as per Technical Specification (Amended Annexure-9)			2				
18.	48 Gig Ethernet ports and 2 x 10G SFP+ for uplink on single chassis TOR Switch as per Technical Specification (Amended Annexure-9)			14				
19.	48 fixed 10-G BASE-T ports and 6 fixed 40/100-Gbps QSFP+ ports for uplink with fully populated transceivers connectivity on single chassis TOR switch as per Technical Specification (Amended Annexure-9)			24				

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Sl. No.	Item Details	Cost for AMC for 2 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column d		Total AMC Cost (Incl. of Tax)
		4th Year	5th Year			% of Tax	Tax Amt.	
		a	b	C	d=(a+b)*c	e	f	g=(d+f)
20.	48 x 25-Gbps fiber downlink ports and 6 x 100-Gbps Quad Small Form-Factor Pluggable 28 (QSFP28) uplink ports with fully populated transceivers on single chassis TOR Switch as per Technical Specification (Amended Annexure-9)			4				
21.	Distribution Switches in High availability with required capacity to connect all supplied access switches with dual uplink of 10/40/100 Gbps in active-active mode for redundancy and load sharing as per Technical Specification (Amended Annexure-9)			8				
B.	Software							
Sl. No.	Item Details	ATS cost for 4 years (Excl. of Tax)		Qty.	Total AMC Cost (Excl. of Tax)	Tax for Column c		Total AMC Cost (Incl. of Tax)
						% of Tax	Tax Amt.	
		a		b	c= (a*b)	d	e	f=c+e
22.	Support charge for IBM WebSphere ND 9.5 PVU			17920				
23.	Total Cost for AMC for Hardware/Software/Licenses (Sum of Sl. No. 1 to 22)							

Table - F
One-time Implementation charges

[Amount in Indian Rupees]

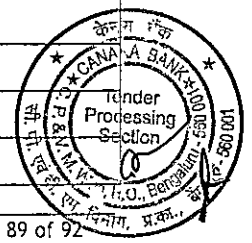
Sl. No.	Item Details		Unit Price (Excl. of Tax)	No. of Units	Total Price (Excl. of Tax)	Tax for Column c		Total Price (Incl. of Tax)
						% of Tax	Tax Amt.	
			a	b	c=a*b	d	e	f=c+e
1.	Servers Installation and Configurations with OS	Per Server		500				
2.	Managed file transfer solution Implementation	Per Site		2				
3.	Backup Software implementation	Per server		500				
4.	Jboss server implementation	Per Server		3				
5.	Apache Tomcate server implementation	Per Server		5				
6.	MSSQL Setup installation per server with cluster configuration (for 24 Servers - in 2 node cluster)	Per server		24				
7.	RHCOS Setup installation and configuration for three cluster (Three nodes in one Cluster)	Per Cluster		3				
8.	Installation of TOR switches	Per Switch		42				
9.	Installation of Distribution Switches	Per Switch		8				
10.	Implementation charges for SAN Director with ISL	Per Director		4				
11.	Implementation charges for SAN switch with ISL	Per Switch		10				
12.	Object Storage implementation Cost	Per storage		2				
13.	Block Storage Implementation Cost	Per storage		4				
14.	Rack and PDU implementation	Per Rack		50				

Sl. No.	Item Details		Unit Price (Excl. of Tax)	No. of Units	Total Price (Excl. of Tax)	Tax for Column c		Total Price (Incl. of Tax)
						% of Tax	Tax Amt.	
			a	b	c=a*b	d	e	f=c+e
15.	Tape Library implementation cost	Per Library		2				
16.	Total Cost for Optional Items (Sum of Sl. No. 1 to 15)							

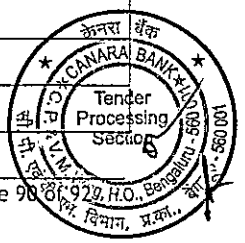
Table - G (Optional)
Price details of Optional Items for 5 Years

[Amount in Indian Rupees]

Sl. No.	Item Details	Unit Price (Excl. of Tax)	Tax for Column a		Total Price (Incl. of Tax)
			% of Tax	Tax Amt.	
		a	b	C	d=a+c
1.	1.92 TB SSD with 3 year warranty (Compatible with the proposed server)				
2.	One CPU of 16 core				
3.	One CPU of 24 core				
4.	One CPU of 32 core				
5.	One CPU of 64 core				
6.	One Memory Stick of 64 GB				
7.	One Memory Stick of 128 GB				
8.	Object Storage per TB Cost				
9.	Block Storage per TB Cost				
10.	Block Storage per controller cost				
11.	Object Storage per controller cost				
12.	One FC Card with minimum 1 number of 32 Gbps FC ports in each card				
13.	One Network Cards, each equipped with at least two 10-gigabit network ports				
14.	One Network Cards, each equipped with at least two 1-gigabit network ports				



Sl. No.	Item Details	Unit Price (Excl. of Tax)	Tax for Column a		Total Price (Incl. of Tax)
			% of Tax	Tax Amt.	
		a	b	C	d=a+c
15.	San Director 32G SFP Module				
16.	San Director 64G SFP Module				
17.	San Switch 32G SFP Module				
18.	San Switch 64G SFP Module				
19.	San Switch Long Wave 32G SFP Module				
20.	San Switch Long Wave 64G SFP Module				
21.	SAN Director per Blade Cost				
22.	SAN Director Blade Cost with fully populate SFP				
23.	CAT 6 UTP Copper Cable length of 3 mtrs				
24.	CAT 6 UTP Copper Cable length of 5 mtrs				
25.	CAT 6 UTP Copper Cable length of 7 mtrs				
26.	CAT 6 UTP Copper Cable length of 10 mtrs				
27.	CAT 6 UTP Copper Cable length of 15 mtrs				
28.	CAT 7 UTP Copper Cable length of 3 mtrs				
29.	CAT 7 UTP Copper Cable length of 5 mtrs				
30.	CAT 7 UTP Copper Cable length of 7 mtrs				
31.	CAT 7 UTP Copper Cable length of 10 mtrs				
32.	CAT 7 UTP Copper Cable length of 15 mtrs				
33.	CAT 7 UTP Copper Cable length of 25 mtrs				
34.	Fiber cables Cable length OM4 of 5 mtrs				
35.	Fiber cables Cable length OM4 of 10 mtrs				
36.	Fiber cables Cable length OM4 of 15 mtrs				
37.	Fiber cables Cable length OM4 of 20 mtrs				



Sl. No.	Item Details	Unit Price (Excl. of Tax)	Tax for Column a		Total Price (Incl. of Tax)
			% of Tax	Tax Amt.	
		a	b	C	d=a+c
38.	Fiber cables Cable length OM4 of 25 mtrs				
39.	Fiber cables Cable length OM4 of 30 mtrs				
40.	One CPU of 8 core				
41.	Total Cost for Optional Items (Sum of Sl. No. 1 to 40)				

The cost mentioned in column "a" of Table-F will be the fixed price for 5 years (i.e., Unit Price mentioned will be fixed for the entire contract period). Bank may procure the above items mentioned in Table-F with the same cost for the entire contract period.

The items brought during the contract period should be co-terminus with the base hardware.

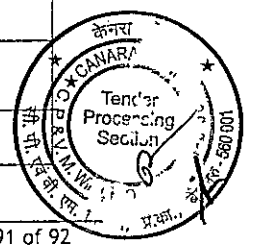
Bank may issue Purchase order(s) to procure items mention in Table-G as per the necessary quantities as and when required by the Bank during the initial purchase or during the entire Contract Period. However, the bidder has to provide the optional items at the same cost mentioned in the Table-G.

Table - H

Total Cost of the Hardware, Software and optional items for 5 Years

[Amount in Indian Rupees]

Sl. No.	Requirement Details	Total Cost of the Hardware, Software and optional items for 5 Years (Incl. of Taxes)
1.	Total cost of Table-A (Price details of Hardware Items for three year warranty period)	
2.	Total cost of Table-B (Price details of Software/License Items (Perpetual))	
3.	Total cost of Table-C (Price details of Software/License Items (Subscription based))	
5.	Total cost of Table-D (Price details of Linear Tape Open Cartridges)	
6.	Total cost of Table-E (Two year contract for AMC /ATS Cost for Hardware/Software/Licenses)	
7.	Total cost of Table-F (One-time Implementation charges)	



8.	Total cost of Table-G (Price details of Optional Items for 5 Years)	
9.	Total Cost of Ownership for 5 Years (Sum of Sl. No. 1 to 8)	

Declaration:

a. Bill of material is submitted on the letter head and is signed by an Authorized Signatory with Name and Seal of the Company.
b. We confirm that we have gone through RFP clauses, subsequent amendments and replies to pre-bid queries (if any) and abide by the same.
c. We have not changed the structure of the format nor added any extra items. We note that any such alternation will lead to rejection of Bid.
d. We agree that no counter condition/assumption in response to commercial bid will be accepted by the Bank. Bank has a right to reject such bid.
e. We are agreeable to the payment schedule as per "Payment Terms" of the RFP.

Date:
Place:

Authorized signatory
Name:
Designation:
Company seal:

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