CORRIGENDUM # 1 Dated 03.07.2024

REQUEST FOR PROPOSAL

FOR PROCUREMENT
OF
IT HARDWARE INFRASTRUCTURE WITH INSTALLATION
AND SUPPORT SERVICES ON INTEL X86 ARCHITECTURE

Ref: SBI/GITC/ITFO/2024/2025/1145 dated: 07/06/2024

IT - FO Tech Ops Department
State Bank GITC
L & T Building, Seawoods
B - Wing, 2nd Floor, Tower-1
Near Seawoods Grand Central Mall
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CORRIGENDUM # 1

S.No	APPENDIX/ANNEXURE/CLAUSE in the RFP	RFP Page No	Existing Clause	Revised Clause
1	**APPENDIX-B** **2. HARDWARE** **A)BLADE SERVERS** **4. Memory**	65	4. Memory Should have at least 32 DIMM slots per server and support up to 4TB of DDR5 4800 MT/s memory.	4. Memory Should have at least 32 DIMM slots per server and support up to 4TB of DDR5 4800 or higher MT/s memory.
2	**APPENDIX-C**	**57 to 79**		Please refer ANNEXURE-1 (A)
3	**APPENDIX-E**	82	6.(1) 1. Readiness of Infrastructure environment with necessary Software installation by respective OEM (OS, VMware/Virtualization environment, DB,WAS/IHS etc.) to Install the applications.	6.(1) 1. Readiness of Infrastructure environment with necessary Software installation (OS, VMware/Virtualization environment, DB,WAS/IHS etc.) by successful Bidder. This includes all required Dashboard and Configuration of various layers as per SOW
4	**APPENDIX-E**	83	13. Payment schedule	13. Payment schedule a) 25% of Hardware cost of with 3 years of comprehensive warranty on delivery b) 15% of Hardware cost of with 3 years of comprehensive warranty - on installation. c) 50% of Hardware cost with 3 years of comprehensive warranty - on commissioning and go live working condition and CDAC audit or any other mechanism as devised by Bank for certifying the material supplied is as per RFP terms. d) Balance hardware cost (10%) along with 3 years of comprehensive warranty will be paid after 90 days of full implementation.

				e) INSTALLATION/ COMMISSIONING/TRAINING cost will be paid after 90 days of full implementation.
				
				f) Backup Software Licenses/ any other software licenses
				   • Perpetual: will be paid after 90 days of full implementation.
				   • Subscription Basis (20% cost of the discovered cost): will be paid annually in Advance. The first-year payment will be done after 90 days of full implementation.
				
				g) Payment for AMC and Services will be made quarterly in arrears.

5	**APPENDIX-E**	85	18. INDICATIVE SUMMARY OF ONSITE RESOURCES	18. **<u>INDICATIVE SUMMARY OF ONSITE RESOURCES:</u>** The team proposed to ensure resource availability 24 x 7 x 365 at DC and DR for daily operations for the services in scope should be as under: TABLE_BELOW *Onsite at Department/DC/NDC Site **Onsite at DR Site **<u>L3</u> resources for Cloud stack (Virtualization/Cloud/K8s) and Infra Stack <u>should be directly from OEM</u>** **<u>L2</u> resources for Infra Stack <u>should be directly from OEM</u>**
6	**APPENDIX-E**	83	11. Limited Trial / Pilot Requirements	11. Limited Trial / Pilot Requirements

Table referenced as TABLE_BELOW:

TEAM	L1	L2	L3/Team Lead	Total
For Cloud stack (Virtualization/Cloud/K8s)	**5(DC*)**	**1(DC*)**	2(DC*)	**8**
Infra Stack	**5(DC*)** +5(**DR****)	**2(DC*)**	1(DC*)	**13**
Project Manager/Lead	1(DC*)			**1**
Total				**22**

			Bank will adopt Phase wise approach for the implementation instead of Limited Trial / Pilot Requirements.	Bank will adopt Phase wise approach (Starting with one FO and subsequently group of FOs at a Time which will be discussed with successful bidder) for the implementation instead of Limited Trial / Pilot Requirements.
7	**APPENDIX-F**	87	Indicative Price Bid (Change in No. of resources)	Indicative Price Bid
8	**APPENDIX-F** **Indicative Price Bid**	88	Indicative Price Bid SAN STORAGE: Change in 3.a. and 3.b.	

For row 7, the nested table:

#	Type of services / Items (TEAM)	Level of Resource	No. of Resource (A)	Rate per month per Resource (B)	Total cost for five years (C)=(A*B*60)	Proportion to total cost (in %) of (C)
1	Cloud stack (Virtualization/Cloud/K8s)	L1	5			
		L2	1			
		L3	2			
2.	Infra Stack	L1	10			
		L2	2			
		L3	1			
3.	Project Manager/Lead		1			
	Total (TRC **)		22			

For row 8, the nested table:

Sr. No.	Item	Quantity	Rate per item	Amount in Rs.	Proportion to Total Cost of A (in %age) #
3.	SAN STORAGE				
a.	Data Storage for DC,DR/NDR, NDC				
	DC AZ1 Prod	185 TB			
	DC AZ2 Prod	185 TB			

			DR AZ1 Prod	185 TB	
			DR AZ2 Prod	185 TB	
			NDC	110 TB	
			NDR	110 TB	
			Pre Prod(DC Site)	450 TB	
			Non Prod(DC Site)	450 TB	
			Total	1690 TB Usable with RAID 6 or Equivalent	
		b.	Backup Storage for DC,DR/NDR, NDC		
			DC	700 TB	
			DR/NDR	700 TB	
			Total	1400 TB Usable with RAID 6 or Equivalent	

S.No	Section	Page	Original	Revised
9	**APPENDIX-L** **Other Terms and Penalties**	104 and 136	Penalties for SLA uptime (calculation) *Shall be Calculated on Pro-rata basis, in case only selective FO is down Example: Let Total Project Cost = X Impacted FO: 2 So, in case of S.No. 2 Penalty Amount =[[((X *3 /100)/24]*2]/12 (Considering 24 FO)	Penalties for SLA uptime (calculation) *Shall be Calculated on Pro-rata basis, in case only selective FO is down Example: Let Total Project Cost = X Impacted FO: 2 So, in case of S.No. 4 Penalty Amount =[[((X *3 /100)/24]*2]/12 (Considering 24 FO)
10	**RESPONSIBILITIES OF SERVICE PROVIDER**	116	6.5 To maintain the hardware for a period of 3 years warranty and further 4 years AMC, as per the	6.5 To maintain the hardware for a period of 3 years warranty and further 2 years AMC, as per the terms and conditions of this Agreement

11	**APPENDIX-T** **BROAD SCOPE OF WORK** **2. DETAILED SCOPE OF WORK** **(A) Virtualization Stack/ Cloud Deployment and Management**	187	3. Workload Domain - App and Web Clusters to be deployed with internal storage and VSAN architecture across Availability Zones (Rack) within each site. Database clusters to be deployed with external storage.	3. Workload Domain – App, Web and DB Clusters to be deployed with external storage across Availability Zones (Rack) within each site.
12	**SCHEDULE OF EVENTS** **Sr No 6**	2	Last date and time for Bid submission Up to14:00 Hours on 04-07-2024	Last date and time for Bid submission Upto14:00 Hours on 15-07-2024
13	**Sr No 8**	2	Date and Time of opening of Technical Bids 16:00 Hours on 04-07-2024 Authorized representatives of Bidders may be present online during opening of the Technical Bids. However, Technical Bids would be opened even in the absence of any or all of Bidders representatives.	Date and Time of opening of Technical Bids 16:00 Hours on 15-07-2024 Authorized representatives of Bidders may be present online during opening of the Technical Bids. However, Technical Bids would be opened even in the absence of any or all of Bidders representatives.
14	**All other Terms & Conditions remain unchanged**			

ANNEXURE-1 (A)

APPENDIX-C

Technical & Functional Specifications

To qualify in the Technical Evaluation, a Bidder must comply with all the requirements as listed in the table below. Bidder(s) must submit their response in Yes or No only, any compliance with qualified statement shall be treated as non-compliance.

Sizing Guidelines

S#	ITEM	Minimum Specification	Qty	Remarks
1	Blade Servers	2 Intel Xeon Gold 6542 Y processors (5th Gen) with 24 Core, 2.9 GHz base frequency, 1.5 TB RAM per server	DC: 220 NDC: 35 DR/NDR: 128 Total: 383	for App, Web & DB workload at DC, DR/NDR, NDC Site
2	Rack Servers	2 Intel Xeon Gold 6542 Y (5th Gen) processors with 24 Core, 2.9 GHz base frequency, 1.5 TB RAM, 6*3.2 TB NVME per server	DC: 10 NDC: 5 DR/NDR: 5 Total: 20	For Management domain cluster
3	Storage a) Web, APP & DB	DC DR/NDR NDC	DC AZ1 Prod: 185 TB DC AZ2 Prod: 185 TB DR AZ1 Prod: 185 TB	• Unified Storage with support for SAN and NAS. • Capacity mentioned is Usable Capacity with RAID 6 or Equivalent

			DR AZ2 Prod: 185 TB	
			NDC :110 TB	
			NDR :110 TB	
			Pre Prod(DC Site): 280 TB	
			Non Prod(DC Site): 450 TB	
			Total : 1690 TB	
	b) Backup	DC DR/NDR NDC	DC:700 TB DR/NDR :700TB Total: 1400 TB	• Unified Storage with support for SAN and NAS. • Capacity mentioned is Usable Capacity with RAID 6 or Equivalent
4	Blade Chassis		As per RFP terms & conditions	
5	Rack		As per RFP terms & conditions	a. Estimated count based on sizing may not exceed 17 Racks in total for Blade Architecture. NB: Considering 6 KVA consumable power/10 KVA Rated Power(Dual) three phase AMPS for each rack b. It may vary based on power and cooling requirement available at Data Centre. c. Bidder has to provide detail description based on the solution in bid submission.
6	SAN Switch		16	2 SAN switch for each of DC-AZ1, DC-AZ2, DR-AZ1, DR-AZ2, Pre-Prod, Non-Prod

				NDC NDR
7	**Environment**			**DC, NDC,DR/NDR, PREPROD, UAT,SIT,DEV (as per Bank requirement)**
	Virtualization/Cloud licenses			**VCF and Add-On licenses will be provided by the Bank which includes Below components:** • **vSphere** • **vCenter** • **SDDC Manager** • **Aria Suite (Aria Operation, Aria Automation, Aria Operation for log, Aria Operation for Network)** • **NSX (Switching, Routing, Firewall, Advance Load balancers-Avi)** • **HCX** • **vSAN** • **Tanzu Kubernetes Grid (Run Time)** • **Data Service Manager**

Standard Guidelines for RACKS (preferred)

Size in Rack Units ('U')	42U
Dimensions (Height x Width x Depth)	2000 x 600 x 1200 mm (Height should not exceed 2000mm inclusive of base/wheels/standons)
Capable Load	Minimum 1300kg (inclusive of frame Max. 1500kg)
Maximum Equipment Mounting Depth	900 mm
Provision for mounting Zero 'U' PDUs (Tool Less mount)	Yes (Rear Side)

Front Door	16-gauge (or less) Single Door with Lock and minimum 77% perforation providing maximum airflow.
	Lift of hinges for easy removal, and field reversibility
Rear Door	18-gauge (or less) Single/Vertical Split Doors with lock and minimum 77% perforation.
	Lift of hinges for easy removal, and field reversibility
Side Doors	18-gauge (or less) Single / Horizontal Split inter/frame lockable panels (no perforation)
	Rack width (600mm) should remain the same with or without sides attached
Rack Top Roof	18-gauge (or less) top roof
Rack Base	Four sides Low profile casters and levelling feet with wheels and brakes
	Bottom covered with 14-gauge (or less)
Top and Bottom Cable Entry Slots (Tool Less snap-in mount)	Rear – Yes, Front – Yes
	Slots/Holes should be able to run 63A industrial socket.
	All cable routing holes/vents should be covered/protected with plastic/rubber Grommets to avoid any leakage of air and avoid cuts to the cables running through.
Rack Door Locks	Lock Mount:
	Middle of the Rack Door for split door model. Length wise middle of the door towards the Left/Right edge for single door.
	Locking:
	Both top and bottom of the racks on the rack frame.
	Customization:
	Locks should be mechanically detachable and should have provision for customizing the lock with intelligent lock.

Cable Management Brackets (Tool Less)	2 full height rack PDU Mounting / cable management brackets (one per side)
Vertical Mounting Rails	Pair of full height 19" EIA mounting rails, accepts cage nuts, U markings (in numerical 01U to 42U) on front and rear of each rail. Rails should be Detachable and Depth adjustable.
Paint / Color	Frame, doors, side panels, top panel, rails and PDU brackets are powder coated Fire Retardant Paint. Preferably Matte Black.
Certifications	EIA-310 complaint Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) complaint.
Rack/Enclosure Body Earthing	Should have provision for earthing the rack both front and rear sides preferably in copper (welded on body of the rack).
Delivery and Assembly	Full Erected Rack with Shock Package, where onsite assembly not required. For assembly is required, need to be done from OEM only.
Consumables	Check Nuts (50units): Rack M6 Cage Nuts (Square) + 20mm Screw + Compatible Plastic Washers. Cable Ties: 150 x 2.5 mm self-locking nylon cable ties (100) 100 x 2.5 mm self-locking nylon cable ties (100) Velcro: 1" Reusable Velcro Tape – 50mtr roll

Standard Guidelines for Server Rack PDU (Preferred Specifications) :

for Load <6.5KW	for Load > 6.5KW
Single Phase (1φ) Vertical Mountable (0U) PDU with minimum 16 C13-Panel Mount Sockets and optional 4 C19-Panel Mount Sockets.	Three Phase (3φ) Vertical mountable PDU with minimum 8 C13-Panel Mount Socket for each phase and 2 C19-Panel Mount Sockets for each phase.
	Input Connection Type: IEC 60309 32A with 5-pin (3L+1N+1E) 32A Industrial Male Plug
Input Connection Type: IEC 60309 32A with 3-pin (1L+1N+1E) Industrial Male Plug	PDU should built-in control with 32A MCB for each phase.
PDU should built-in control with 32A MCB.	
PDU termination cable should be of minimum 6Sqmm 3-core Copper FRLS flexible cable (min. 3meter from PDU to Plug end)	PDU termination cable should be of minimum 6Sqmm 5-core Copper FRLS flexible cable (min. 3meter from PDU to Plug end)

1. GENERAL			
Sr. No	**Feature**	**Technical Specifications/Requirements**	**Compliance (Y/N)**
1		Planning, design, best practice implementation and installation for initial cluster of each components/ product should be done by the respective OEM. Remaining implementation and Installation of each components/product can be done by the Bidder/SI/OEM.	
2		The bidder shall propose direct highest-level OEM support 24x7x365 days for all proposed products with unlimited number of incidents and dedicated support manager should be aligned accordingly in addition to the on-site support as part of RFP.	

3		Bidder/OEM should have 24x7 support center in India and logistics center in Mumbai, Hyderabad and other major locations.	
4		The Hardware should carry minimum warranty of 3 years plus support for next 2 years, thus covering 5 years service (onsite). Besides this the Hardware with firmware and other security upgrades to be provided for at least 5 years from the date of implementation	
5		The Software should be Perpetual / Subscription with ATS included back-to-back from OEM for all years. Besides this the software should be covered for Patch and security upgrades for at least 5 years from the date of implementation with no cost to the Bank.	
6	**UPTIME**	**a)99.99% FO wise** **b)Bidder has to maintain inventory at local place to ensure uptime SLA as per Scope of this RFP**	
7		The bidder shall ensure that all the proposed hardware/software components as part of the solution shall have the ability to run on proposed Solution based on the x86 architecture.	
8		The Proposed solution should provide configuration management capability by integration with ITSM/ITAM, and any other solution deployed in Bank environment.	
9		Bidder has to ensure that all the hardware and software components proposed are of minimum Data Centre level enterprise class solutions.	
10		A centralized console for central management and monitoring of the proposed hardware solution at DC, DR and Near Site to be provided by the bidder. The console should have capability to monitor the Data Centre Operation in terms of availability, performance, incidences, ticketing, SLA etc (at each level, ie. OS, Network, Database, Application, Middleware etc).	
11		The bidder has to ensure data replication for 3 locations i.e., DC, DR and Near Site (Near DC & Near DR). Replication between DC and DR will be asynchronous manner whereas between DC/DR and Near site will be synchronous manner to achieve zero RPO. **However, Bank reserves the right to change any of the methodology and architecture any point of time or as and when required.**	
12		Solution should be Vertical & Horizontally scalable to meet the future growth of the Bank.	
13		Solution should be able to integrate Internal Network within VM/stack and other applications (Ex-Active Directory, IT Asset Management, etc.) on SBI Connect.	
14	Dashboard	Integrated Dashboards to Monitor Cluster and Individual VM with capability of drilling down to Application/Network/Hardware level	
15		The solution should be capable to host multiple OS	
16		Bidder to ensure High Availability at all possible layer (App, Web, DB, Infra) and component level (H/w, S/w, Interconnection) to ensure NSPOF (No Single Point of Failure) by design and deployment	
17		Automated delivery of data-center services such as a) Compute	

		b) Storage c) Networking d) Backup e) Replication f) Load balancing g) Fault tolerance h) Security i)Firewall j) Deployment of AV,Firmware,Patch(H/w,s/w,OS, Application) k) DR Drill	
		Built-in replication capability which will enable efficient array-agnostic replication of virtual machine data over the LAN or WAN.	
		I/O prioritization for virtual workloads to ensure that business critical VMs are not affected due to congestion by other VMs on the same host	
		The solution should support coexistence of multiple versions of application, which would be helpful during application upgrade and compatibility check	
18	Replication	a) VM Level	
		b) Storage Level	
		c) DB Level: Through Oracle Data Guard	
19		Solution design should ensure the best practice as per Bank's IS Policy and Industry practice at all possible level to segregate Prod/Non-Prod Data, Management/Workload Data, Backup/Replication, etc. Bidder must ensure sufficient Port availability at Storage and other equipment level to avoid any performance issue.	
20		Storage Virtualization/Metro Cluster deployment capability at Storage level for Active-Active cluster deployment with AZ (Availability Zone) to ensure Zero downtime.	
21		Proposed solution should provide life cycle management capabilities as below: a. Future platform upgrade and patching with single life cycle management for cloud platform solution. b. Physical firmware life cycle management. c. Certificate Management for internal cloud platform solution components.	
22		Solution should be capable of software defined Networking capability with following features: a. Software defined switching and routing capability. b. Distributed Firewall/Micro-Segmentation for granular security across VMs and container PODs. c. Enterprise defined Load Balancers for App & Web VMs with application traffic analytics and Active-Active deployment capability.	

Sr. No	Feature	Technical Specifications/Requirements	Compliance (Y/N)
23	Encryption	Solution should have all data encrypted i.e. Data at Rest, Data in Motion and Data in Memory	
24	Additional	a) Proposed solution should support 24x7 real-time monitoring, with at-a-glance and drill-down views of health, performance and workload of the virtual hosts. b) Proposed solution should support automated action for popular alarms (automated or semi-automated), with at-a-glance and drill-down views of health, performance and workload of the virtual hosts.	

2. HARDWARE

A. BLADE SERVERS

Sr. No	Feature	Technical Specifications/Requirements	Compliance (Y/N)
1	Chassis	Blade Chassis with Minimum 8 Blade per chassis support	
2	Processors	2 Nos. of Intel Xeon Gold 6542 Y processors(5th Gen) with 24 Core, 2.9 GHz base frequency, 1.5 TB RAM per server	
3	Chipset	Latest Intel chipset compatible with Intel Xeon 4th Gen or later Scalable processors	
4	Memory	Should have at least 32 DIMM slots per server and support up to 4TB of DDR5 4800 or higher MT/s memory.	
		The Server should be configured with 1.5TB of DDR5 Memory from day one with minimum 64GB DIMMs	
		Support for advanced memory redundant technologies like Advanced error-correcting code (ECC) and memory mirroring	
5	RAID Controller	SAS RAID Controller supporting RAID 0 and 1 with 1G or higher	
6	Internal Storage	Minimum 2 x 400GB M.2 drives or higher for installing the operating system hypervisor.	
7	Operating System	Should be Software agnostic and Compatible with VMware ESXi Server version 7.0 U2 or later. Also, the hardware should support any version upgrade coming in next 5 years. If hardware supplied by selected OEM is not compatible VMware releases during 5 years from date of commissioning, they need to replace hardware without any additional cost to the Bank.	
8	Network	Should have atleast 2 * 25 Gbps ports per Blade	
		The server should be provided with card level redundancy	

9	SAN Connectivity	Should provide two FC connectivity by using Converged Network Adapters or Dual port 16/32 Gbps FC HBA	
10	Management	The server should support industry standard management protocols like IPMI v2 and SNMP v3.	
		The OEM must have a management software which will manage all the servers from single GUI at physical level.	
		The management software must have the capability of providing proactive alerting wherever possible	
11	Remote Management	Should be able to manage the server and get access to critical information about the health of the server from any remote location with the help of standard web browser.	
		Integrated management ASIC with dedicated RJ45 port or chip providing out of band access	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from remote CDROM drive or an image of the same.

Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time. | |
12	Expansion Slots	Minimum 3 PCIe 3.0 Type based x16 Slots supporting Ethernet, FC adapters and Graphics Card	
13	Industry Standard Compliance	ACPI 5.1 Compliant, PCIe 3.0 Compliant; WOL Support; Microsoft Logo Certifications; USB 3.0 support or better	
14	Ethernet Controller	The bandwidth required for network per server is minimum 2x 25 G per server with minimum 25G bandwidth available per card.	
		Each of the network port must be capable of tailoring network connections and speeds based on application needs.	
		One (1) NIC or Equivalent port dedicated for Remote Management	
15	Ports	One (1) USB 3.0 port for connecting USB drives	
16	Others	Supports hot swappable redundant fans.	
		Supports hot swappable redundant power supplies.	
		The power supply should be rated the highest the OEM has to offer for the specific rack type and all the power accessories such as cable/PDU etc. should be provide	
B. RACK SERVER			

		(For Management Domain)	
Sr. No	**Feature**	**Technical Specifications/Requirements**	**Compliance (Yes / No)**
1	Form Factor	1U / 2U Rack mount Server	
2	Processors	2 Nos. of Intel Xeon Gold 6542 Y (5th Gen) processors with 24 Core, 2.9 GHz base frequency, 1.5 TB RAM per server	
3	Chipset	Latest Intel chipset compatible with Intel Xeon 4th Gen or later Scalable processors	
4	Internal Storage	The server should Support atleast 8/16 hot-swappable drives SAS, SATA SSDs and NVMe or all NVMe disks	
		The server must support two identical M.2 Drives SSDs of 480 GB. These drives should not consume the 8/16 drive slots.	
		Depending on the node type, the server must have 6 x 3.2 TB NVMe in each server for capacity requirement.	
		Proposed server configuration should be certified with VSAN ESA architecture	
5	Memory	Should have at least 32 DIMM slots per server and support up to 4TB of DDR5 4800 or higher MT/s memory.	
		The Server should be configured with 1.5TB of DDR5 Memory from day one with minimum 64GB DIMMs	
		Support for advanced memory redundant technologies like Advanced error-correcting code (ECC) and memory mirroring	
6	Network	Should Network have 3 Cards (Dual port) 25G SFP+ Card.	
		The server should be provided with card level redundancy	
7	SAN Connectivity	Should provide two FC connectivity by using Converged Network Adapters or Dual port 16/32 Gbps FC HBA	
8	Management	Should support out of band upgrades, Agentless out-of-band management, integrated diagnostics, Power monitoring and reporting. One 1-Gbps RJ-45 management port should be provided.	
		The server should support industry standard management protocols like IPMI v2 and SNMP v3.	
		The OEM must have a management software which will manage all the servers from single GUI at physical level.	
		The management software must have the capability of providing proactive alerting wherever possible	
9	Others	Supports hot swappable redundant fans.	
		Supports hot swappable redundant power supplies.	
		The power supply should be rated the highest the OEM has to offer for the specific rack type and all the power accessories such as cable/PDU etc. should be provide	

		Rail Kit and cable management arm to be provided along with the server.	

C. BLADE ENCLOSURE			
Sr. No	**Feature**	**Technical Specification (Recommendation)**	**Compliance (Yes / No)**
1	Blade Chassis	Chassis should be able to support Intel Xeon Gold 6542 Y processors and subsequent generation of Intel Blade Servers. OEM should have server models for the same. New chassis should be quoted for all blade servers.	
		Same enclosure should support 2/4 Processor based blade servers of latest generation of Intel Processor.	
		The maximum height of the Chassis should be 10U	
		Should support Hot Pluggable & Redundant chassis management modules	
		A) Blade Chassis should have a dual/single active/passive midplane OR dual active midplane OR mix of passive Mid-plane and no mid-plane where the blades and other subsystems get plugged on and provide high availability and performance. B) In any case, the midplane or no midplane should not be a bottleneck to adopt future technologies like 50G, 100G, 200G. The blade chassis should provide high availability and high-performance.	
		Support simultaneous remote access for different servers in the enclosure.	
2	Interconnect Support	Should support simultaneous housing of Ethernet, FC, iSCSI offering Hot Pluggable & Redundancy as a feature. Enclosure should have minimum 6 Interconnect Bays.	
3	*Blade Server Ethernet Interconnect	Interconnect should have switching capability with at least 9000 MTU to support Jumbo Frames. Redundant network modules must be stacked over minimum of two 100G links.	
		The switching latency between chassis should be less than or equal to 1 micro-second	
		Gachibowli Each enclosure must have total 8 x 25G ports with pair of redundant network modules with 4 x 25G uplink ports respectively in each. i.e., 4 x 25G uplink bandwidth must be maintained even after 50% of interconnect failure and without using multi-chassis aggregation. **OR** In case of multi-chassis aggregation (not more than 4 chassis in one set), each master enclosure must have redundant master modules to eliminate single point of failure. The multi-chassis setup should	

		have total 32 x 25G uplink ports with 16 x 25G uplink ports for each master enclosure i.e., 16 x 25G uplink bandwidth must be maintained even after 50% of master interconnect failure for multi-chassis set.	
		Rabale & NDR Site Each enclosure must have total 20 x 10G ports with pair of redundant network modules with 10 x 10G uplink ports respectively in each. i.e. 10 x 10G uplink bandwidth must be maintained even after 50% of interconnect failure and without using multi-chassis aggregation **OR** In case of multi-chassis aggregation (not more than 4 chassis in one set), each master enclosure must have redundant master modules to eliminate single point of failure. The multi-chassis setup should have total 72 x 10G uplink ports with 36 x 10G uplink ports for each master enclosure i.e. 36 x 10G uplink bandwidth must be maintained even after 50% of master interconnect failure for multi-chassis set.	
4	*Blade Server FC Interconnect	The enclosure must have redundant Fibre Channel interconnect modules with minimum 6 x 32Gbps Uplink Ports to the SAN Switch i.e., 6 x 32G uplink bandwidth must be maintained even after one interconnect failure. Each module should be fully licensed to use all available ports. All required licenses to ensure interoperability with Bank's existing fabric must be provided.	
5	Storage Capacity	The enclosure must have provision to support internal storage capacity of minimum 50TB usable space using up to maximum 3.84TB size for 12G SAS Mixed Use SSD Drives for capacity storage and additional 10% of Caching drives, should be considered additionally. The usable storage calculated must be using Raid 1 and without any storage efficiencies like deduplication and compression. This is required to be given in one chassis per site.	
6	Power Supply	Enclosure should be fully populated with hot pluggable power supplies of highest capacity available and supported by the Blade enclosure. Power supplies should support N+N as well as N+1 redundancy without any performance impact on the servers when the Blade enclosure is fully populated with all the blade servers (without CPU throttling), where N should be greater than 1. Redundant PDUs must be provided by the OEM must be able to take load of all the hardware (servers, chassis & TOR). In case of one PDU failure, the PDU must be able to handle all the load without disruption to the solution. Power supplies should be Platinum power supplies certified by 80 Plus.	
7	Cooling	Should be provided with the capability to set power consumption limit per blade as well as per enclosure basis, based on need. Fan Module should be controlled through temperature sensors for achieving variable speed with reference to environmental conditions.	
8	System Software	Management/controlling software must be from the OEM itself.	

9	Management	All required System software must be from the OEM itself. Complete GUI with view of the individual blade chassis, multiple chassis in a rack, blade servers, power consumption at chassis level and blade level, intake air temperature and temperature of various thermal zones within the server. Management – Comprehensive web enabled system management tool that monitors the system health, environment, critical action etc. With its own data engine to store status reports, alerts and error notifications.	
10	Deployment & Remote Management	Complete Hardware based Remote Administration from a standard web browser with Event logging, detailed server status, Logs, Alert Forwarding, virtual control, remote graphical console, Remote Power Control / Shutdown, Virtual Media for Remote boot and configuration, Virtual Text and Graphical Control. The blade system should have the capability of managing all the blades in the same enclosure simultaneously. Including SNMPv3 & RESTful API support for sending events and logs to external monitoring/management tools of the bank.	
11	Warranty/AMC	3 years Warranty and 2 years AMC - 24x7 comprehensive onsite support from OEM	

* NOTE: The number of ports required per interconnect has been derived considering the setup which includes 12 servers per chassis. If OEM provides a solution with lesser number of servers per chassis the number of ports required on interconnect must be provided as per the oversubscription, bandwidth and redundancy requirements per chassis.

In addition to the count of servers, for Network 1:4 oversubscription has been used whereas for Fibre Channel traffic 1:1 oversubscription is used. OEM can consider 1:2 oversubscription ratio for Fibre Channel in case they provide dual port 32G FC card inside the blade server. The OEM must make sure that the proposed solution must provide dedicated traffic at Chassis level as per the above oversubscription values considered for network and fibre channel traffic.

D. SAN STORAGE		

Sr. No	Feature	Technical Specification (Recommendation)	Compliance (Yes / No)
1	Controller	Active-Active Multicontroller storage with Minimum 2 controllers scalable to 4/8 within the same cluster	
2	Cache	Global/Metro cache with minimum 256 GB Cache per controller	
3	Capacity	Storage should be configured as per APPENDIX-C (sizing guidelines) usable capacity with all NVMe drive configuration with each drive capacity less than 4 TB. Each storage should be scalable to more than 1 PB usable capacity.	
4	SAN Ports	At least 4 * 16 /32 Gb FC ports per controller	

Sr. No	Feature	Technical Specification (Recommendation)	Compliance (Yes / No)
5	SAN Switch	Redundant SAN Switches with at least 24 * 16 /32 Gbps ports. Required FC Cables to connect to servers should be provided by the bidder	
6		(a) IOPS: 500,000 per storage with 70:30 Read-Write ratio. (b) Quality of Service (QOS) (c) Non disruptive upgrade	
7	Ransomware Protection	Should have Ransomware detection and prevention capability.	

<table>
<tr><td colspan="4" align="center">3. RACK
To be seen along with specification mentioned under Standard Guidelines(Preferred)</td></tr>
</table>

Sr. No	Feature	Technical Specification (Recommendation)	Compliance (Yes / No)
1		Industry standard Server Rack (with digital ammeter) which should accommodate Proposed Servers and Network Components	
2		Adjustable Fully Rescissible Vertical Posts/Mounting Angles	
3		Hinged, Fully Perforated Steel Doors in Front and Rear. Vertical half-width	
4		Removable, non-perforated Side Panels.	
5		Steel Top Cover, with provision for Cable Entry	
6		Steel Bottom Cover, with provision for Cable Entry	
7		Top-Cover-mounted Ventilating Fans	
8		Heavy Duty Castor Wheels with Brakes	
9		Manufactured in India by APW, APC, Rittal, HP or Netrack	
10		The Proposed solution must factor Racks for optimized sizing to achieve high availability with reduced number of racks. The Maximum Power limit of each chassis should be 10kVA.	

4. BACKUP	

	A. Backup Software Specification		
Sr. No	**Feature**	**Technical Specifications/Requirements**	**Compliance (Y/N)**
1		Must have the ability to perform different backup, restore and replication jobs simultaneously	
2		The backup software should support the 3 - 2 -1 approach of data protection and security. Air-Gap Arrangement to be ensured	
		The solution should support the existing tape libraries at DC and DR site. The bidder has to make the necessary configuration changes for conversion of existing Backup Tapes in compliance with new backup software and provide training to Bank officials for using the Backup software. Also, the bidder is required to manage backup, restoration, other activities related to backup activity, of both new and existing tapes, during the entire contract period.	
3	Backup platform	The proposed backup solution should support heterogeneous Operating system platforms including Microsoft Windows Server, Solaris OS, SUSE Linux Enterprise Server, IBM AIX, Oracle Enterprise Linux (Oracle VM), VMware, Hyper-V, Xen Server, Red Hat Linux, VDI, Ubuntu etc.	
		Backup software should be able to protect the following through online agents enabling granular restores. Major DBs like Oracle, MS SQL, MySQL, Maria DB, etc. and Applications likes SAP, Oracle-Web logic, Oracle-EBS, MS Active Directory, etc. across wide range of popular Windows / Linux / AIX and Unix flavours. All Required Backup Software licenses should be included in the solution	
		The proposed solution should have the capability to take Backup of Network Shares and UNC path and should support NDMP backup	
		The Proposed solution should be provided with multi streaming backup facility in order to ensure faster backups.	
		The Proposed backup support VMware , Hyper Visor VM image level backup with option to granular restoration at file level, database instance level etc. The Backup solution should provide faster recovery of VMs.	
4	Deduplication/Compression	Backup software should be a Hardware Agnostic software and it should support snapshot integration with hypervisors like VMware, Hyper-V and RHEV 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.	
5	Truncation	Should support Log truncation of SQL/Exchange/Oracle DBs in VMs which were backed up as VM images	
6	Backup Media	Disk to Disk to Tape/Cloud OR Disk to Disk with all specific requirement for Backup as per the RFP	

7	Ransomware Protection	The solution can be offered as a combination of D2D HW & Backup software or purpose-built recovery appliance with minimum 700 TB Usable capacity The proposed Backup solution should have the following capability for protection against Ransomware or Corruption	
	a.	Real-time data protection with near zero data loss (RPO)	
	b.	Recovery Assurance through Proactive / Continuous Validation and Consistency check during both Data Ingest and at Rest	
	c.	Dashboard view of Backup progress and Recovery Window to Bank team	
	d.	Fast Data recovery at any given point in time based on implemented policy	
	e.	Capability to perform space efficient data protection for TDE Encryption enabled source Database	
	f.	Should have built in Malware Detection Engine and support on demand scans for malware attacks	
	g.	Should support options for immutable snapshots / backup, WORM, Air-Gap and data isolation capability for backup data	
	h.	Should support Syslog and SIEM Tool integration	
	i.	Capable to instantly report backup inconsistencies into SIEM tools to act fast and reduce further risk to data	
8	Oracle	Should be able to integrate with RMAN based backups to perform consistent oracle backups and recoveries	
9	Encryption (Data at Rest, Data in Motion and Data in Memory)	Backup Should be encrypted. The encryption should be software/hardware based. The proposed backup solution must support at least AES 256-bit encryption capabilities.	
10	Storage Integration	The backup software should integrate with all industry leading storage platforms like HP/ NetApp Dell EMC/HDS/IBM etc. to integrate with their snapshot technologies such as BCV, Flash copy, Snapshot etc. and should be licensed along with the offer	
11	Management	Automatic scheduling for daily, weekly and monthly backup.	
		Backup Software must support GUI with centralized management / Single interface for management of all backup activities across the entire storage capacity supplied.	
		It should be possible to create a user, assign a role, delete a role, limiting user logon attempts and viewing users logged onto the backup server	
12	Logs/Truncation	As a backup tool all audit trails must be logged for tracking any changes on backup server. Should support Log truncation of SQL/Exchange DBs either on daily, weekly or monthly basis depending on the	

		customer's requirement. The backup software should also support purge of archive logs in case of Oracle DB. The log truncation should be supported in agent-based or agentless backup.	
13	Reporting Capabilities	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.	
		Proposed solution should support reporting of all workloads which are backing up in cloud vendors like AWS, Azure, GCP, etc	
		Proposed solution should report the details around VM which include number of disks in VM, centre location, Datastore location, ESX host etc. The solution should also report automatically on number of VMs that are protected, NOT protected and are over protected (backed up more than once). The solution should allow for restore of a VM to another vCentre, ESX host from single management console.	
14	RPO/ RTO and Recovery Assurance	Backup software must have an inbuilt feature of backed up data validation for a VM or VM group without an explicit need of a Sandbox environment.	
		Recovery verification should automatically boot the server from backup and verify the recoverability of VM image, Guest OS and Application Consistency and then publish automated reports to be used in backup / recovery audits.	
		Backup software should provide Backup and Replication capabilities to DR site 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.	
		Proposed backup software should be able to Harden the Linux/OS Repository. This service will prevent backup copies of data from any corruption or ransomware attacks.	
		The software should support Group Managed Service Accounts which should have an option to users to allow change passwords after every 30 days and allows for complex password policy.	
		The proposed backup software should be able to integrate with anti-virus software and scan before recovery of VMs and ensure that any infected VM is not restored or restore it with disabled network adapters to prevent any infection to spread through the network	
		Proposed backup software should have the ability to selectively delete files which should not be restored from the backup copies without restoring the backup. 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 support instant file share recovery in NAS storages to allow users to access files fast after disaster.	
15	Retention	As per Bank Policy	

Sr. No	Feature	Technical Specification (Recommendation)	Compliance (Yes / No)
		B. Backup Storage Specification	
1	Controller	Active-Active Multicontroller storage with Minimum 4 controllers scalable to 8 within the same cluster	
2	Cache	Global/Metro cache with minimum 64 GB Cache per controller	
3	Capacity	Storage should be configured with 700 TB usable capacity with RAID 6 and equivalent and all SATA / SSD disks with each drive capacity less than 15 TB. Proposed storage should be scalable to more than 2 PB usable capacity. Note: Bidder offering Backup Solution Based on Instance, should calculate licenses based on Capacity given. In case of any shortfall in the licenses for the given capacity during the tenure of the project, selected bidder should provide the same without any cost to the Bank.	
4	Network Ports	At least 4 * 16 /32 Gb FC ports and 2 * 25 Gbps Ports per controller	
5	Compression / Deduplication	Storage should natively support Compression and deduplication features to have better storage efficiency for backup	
6	Other	Bidders are free to propose purpose built backup appliance (PBPA) but should ensure high availability and no single point of failure as part of the proposed solution	
7	Tape Library	Tape Library with LTO-9 or Latest tapes to be incorporated for long term backup and offsite copy in case part of the Solution offering	
8		• Immutable Secure Snapshots (Cyber Resilience and Compliance) • Quality of Service (QOS) • Non disruptive upgrade	

Technical Evaluation Matrix

NA

Name & Signature of authorised signatory
Seal of Company