

Annexure 11–Technical Requirement (Project Scope)

A. Project Scope

Bank will award the contract to the successful vendor and the vendor should deliver the service with the scope as briefed below:

1. Detailed Scope of work :

The brief scope of Work of the successful bidder is to Supply, Installation, Configuration and Maintenance of Unified Storage System. The services covered as part of the vendor includes, but not limited to the following:

- Supply, Installation and Maintenance of Unified Storage System as per Bank's requirement with coordination of Bank's identified teams at Bank's identified location.
- Bank will install 1 Unified Storage System at Mumbai and 1 at Hyderabad. Bank reserves the right to shift the Unified Storage System to new location/s services will continue to be in force at the new location.
- The Successful vendor need to design the Setup Architecture including physical infrastructure and logical design as per bank's need.
- The successful vendor shall co-ordinate with Bank's identified team to support for configuration issues, hardware replacement etc.
- The successful vendor will configure, install, de-install, re-install, re-configure (in case Bank need any configure change) at no extra cost during the entire contract period.
- Supply, commission, install, test, configure, integrate with existing system and maintain the Unified Storage System and add on components, which are approved by the bank.
- Break-fix support of supplied Unified Storage System and OS/ firmware upgrades for the appliance.
- The successfully shall provide patches/ upgrades of OS/ firmware during warranty and AMC period without any extra cost to Bank. The successful vendor will provide timely proactive deployment of latest firmware versions / security patches in coordination with Bank's identified team.
- The resolution/replacement time for any Unified Storage System issue shall be 4 hours. There should be 24x7x365 support for any technical issue for all the supplied products through this RFP directly from the OEM and the vendor.
- Bank shall freeze installation setup, configuration and schedule in mutual consultation with the successful vendor and Bank's identified teams.
- Confidentiality of the Bank's setup must be maintained by vendor.
- Engineer from vendor must have adequate knowledge for handling the installation, configuration and support & services for Unified Storage System.
- Successful vendor need to provide complete call logging details along with escalation

matrix.

- The successful vendor need to specify various infrastructure requirements which need to be provided for commissioning and smooth functioning of the equipment. This will include site requirements, power, cables, connectors, network cards / ports, UPS, environmental conditions, illumination etc
- If any services, functions or responsibilities not specifically described in this scope but are an inherent, necessary or customary part of the services and are required for proper performance or provision of the services in accordance with the scope, they shall be deemed to be included within the scope of the services, as if such services, functions or responsibilities were specifically required and described in this scope and shall be provided by the vendor at no additional cost to the Bank.
- After installation the successful vendor need to provide OEM authorized certification/training program to Bank's identified people, regarding installation, configuration, operation, basic troubleshooting etc as per Bank's requirement. Detailed training requirement will be shared with the successful vendor.
- Vendor is expected to provide post installation support to the Bank. The successful vendor will provide the assistance whenever required. Warranty and AMC support will be provided by the successful vendor.
- Vendor should provide the complete documentation including technical, operations, user manual, etc.
- Following documents should be delivered by the Vendor to the Bank including user manuals, installation manuals, operation manuals, design documents, process documents, technical manuals, technical specification, system configuration documents, debugging/diagnostics documents etc
- The proposed Unified Storage System should be in the form of hardware box and should comply with technical specification given in "B. Technical Specification for Unified Storage System". If the make and model proposed by the vendor do not comply with technical specification given in "B. Technical Specification for Unified Storage System" the vendor would have deemed not to be meeting the Technical requirements hence will be disqualified in technical bid evaluation.

B. Technical Specification for Unified Storage System

Proposed Make :

Proposed Model :

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
A	STORAGE CONTROLLER		
1	The unified storage system should support all Block and File protocols with minimum two numbers of controllers and scalable up to at least 8 controllers in the same cluster in active-active configuration.		
2	Communication between storage controllers/storage nodes should happen only using Infiniband/10Gig/FC/SAS which provides high bandwidth and low latency.		
3	The proposed LUNs should be distributed across multiple storage controllers for higher performance and high availability..		
4	In the event of addition of storage controller/storage node to storage solution, existing data should be rebalanced (auto-balanced) across all storage controllers/storage nodes without any impact on performance.		
5	Storage system must be configured to provide sustained aggregate sequential write performance of 1.5GB/sec. Cluster throughput should be scalable to 10GB/sec by adding controllers in the same cluster.		
B	CACHE & MEMORY		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
1	The proposed storage should perform write cache mirroring for data availability. The cache mirroring should happen over dedicated paths/bus between the controllers without using the external host and/or disk ports.		
2	Cache should be protected for Writes either through a battery backup for upto 72 hours or by destaging to flash/disk.		
3	The unified system must provide capability to use SSD/Flash as an extended/secondary cache scalable upto 48TB in a single cache/tiering pool.		
4	The cache management should be adaptive as per the I/O workload. The storage should dynamically allocate cache to accomodate the changing I/O workload and not restrict the write cache to value less than 20% of total cache available.		
5	The proposed storage array must have minimum 128GB memory across the two SAN controllers. The entire memory must be globally coherent and must be available for both read and write operation.		
C	DRIVE & DISK		
1	The proposed storage array should support SSD, 10K/15K SAS drives. Each drive must be dual-ported with minimum 6/12 Gbps SAS interface. The SSDs should allow creation of LUNs for hosting critical data.		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
2	The unified system must support intermixing of SSD, SAS and SATA drives to meet the capacity and performance requirements of the applications. The system must support a minimum of 480 disks in a dual controller architecture irrespective of any form factor i.e. 3.5" and 2.5".		
3	The proposed storage shall be supplied with 24TB usable capacity (considering RAID 5) and scalable upto 4800TB in a dual controller architecture. The required capacity shall be supplied using 10TB in SSD pool & 14TB in SAS pool. License feature to enable policy based tiering across SAS and SSD tier should be provided for proposed capacity.		
D	PROTOCOLS & OS		
1	The storage should be a true unified storage configured with FCP, iSCSI (multi-target & multi-LUN), SNMP MiB II, NFS(v2,v3,v4,v4.1), TCP/IP, UDP, CIFS, NDMPv3, SMB(SMB2 & SMB3), pNFS and FCoE protocols for use with different applications and should support the maximum capacity offered by the storage system and there should be only one OS to provide the required Protocols (The proposed OS should not be a general purpose OS such as Windows, Linux etc.). Any hardware/software required for this functionality shall be supplied along with the solution.		
E	RAID & DATA PROTECTION		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
1	The proposed storage array must support all Industry Standard RAID levels including 0, 1, 10, 5 and 6 or equivalent to offer protection for single disk failure, dual disk failure and mirroring. The storage array should allow online expansion of existing RAID/Disk group.		
2	Storage system must support detection of silent data corruption by doing parity checking on write and read operations both. System should also support fixing of corruption in case of parity mismatch. System should provide safeguard against data errors due to disk failure, unrecoverable read errors and network induced errors.		
3	The proposed unified storage system should be configured to provide data protection against two simultaneous drive failures.		
4	The required number of hard disks for parity & spares, should be provided exclusively of the usable capacity mentioned. At least 3% of the usable capacity requested on each tier should be configured as spare drives with the subsequent disk types. This reserve should be used for data regeneration in the event of a drive failure.		
5	The storage system should be possible to withstand failure of any 2 disks per RAID-Group of size not more than 20 disks. In the case, architecture uses a single pool instead of multiple RAID Groups, system should be resilient against failure of two drives for every 20 drives used in the pool.		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
F PERFORMANCE & HIGH AVAILABILITY			
1	The storage array should have No Single Point of Failures (NSPoF) providing high availability at component and functional level.		
2	There should not be more than 12.5% degradation of performance in case of any component or controller failure in the storage.		
3	The proposed storage array systems must natively support automated Sub-LUN tiering of data within the Storage to achieve improved performance and lower Total cost of Ownership. The storage should provide auto tiering between different tiers (SSD, SAS(10K/15K)/NL-SAS) with independent RAID types.		
4	The unified storage should be configured with Quality of Service feature for IOPs/Throughput for both Block and File.		
5	Unified System should have redundant hot swappable components like controllers, disks, power supplies, fans etc.		
G FRONT-END & BACK-END CONNECTIVITY			
1	The proposed unified storage system should have minimum 4 x 10GbE Ports, 4 x 8Gb/16Gbps FC for host connectivity per HA pair.		
2	Single controller/node of storage system should offer 48Gbps of aggregate bandwidth for disk drive connectivity.		
3	The proposed storage should be unified ie., it should have SAN and NAS		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
	protocols configured from day one.		
H	SCALABILITY & UPGRADABILITY		
1	The unified Storage should be a true scale-out architecture allowing mixing of Controller/Nodes within same product line with higher configurations.		
I	POINT-IN-TIME IMAGES/SNAPSHOTS		
1	The unified storage should have the requisite licenses to create point-in-time snapshots. The storage should support minimum 250 snapshots per volume/LUN. The license proposed should be for the complete supported capacity of the unified system for both block and file.		
2	The unified system should support instant creation of clones of active data, with near zero performance impact for both block and file.		
3	The storage array must have Space-efficient copy-on-write/redirect-on-write snapshots; supports NDMP-based backup		
4	The storage array should support pointer based, space efficient Snapshots. The full copy Clones with update incremental data synchronization. The snapshot copies to be independent of each other, restoring a snapshot of production LUN should not invalidate the rest of the snaps for the same production LUN. If licensed separately, necessary licenses for entire supplied capacity to be included.		
J	MANAGEMENT & DIAGNOSTICS		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
1	Single management, easy to use GUI based and web enabled administration interface for configuration, storage management and performance analysis tools for both block and file. Also there should be a CLI interface as well for cluster management.		
2	Management software should provide features like Nonintrusive alerting, Performance and Capacity reports, Ongoing health check analysis.		
3	The storage array should provide all required software like Integrated automatic RAID Manager, Clone, Snapshot, Fast Boot, telnet, e-mail alerts, NIS, DNS, SNMP, FilerView, NDMP, Clustered Failover, Multistore, Replication, Appliance Watch, VFM, Data Fabric Manager, SAN Manager, Virtualization, Performance management & QOS.		
4	Any Multipathing software required for the solution must be supplied for unlimited host connectivity		
K	OS SUPPORT		
1	The storage array must support latest versions of leading operating systems like Linux (RHEL / SUSE), MS Windows 2012/2008, UNIX (AIX / HP-UX /Solaris), etc. The array system shall support virtualized environment for VMware, Citrix Xen Server, KVM and Microsoft Hyper-V.		
2	The proposed Storage shall support all above OS-level Clustering from leading OEM's.		
L	DEDUPLICATION & COMPRESSION		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
1	Proposed unified storage should support block level data de-duplication and/or compression for all kinds of data (structured & unstructured) on both block and file. The hardware and software license required must be provided as part of the solution.		
M	STORAGE VIRTUALIZATION		
1	The storage should be able to virtualize any 3rd party storage systems and required licenses to be provided at later stage only as per requirement.		
N	REPLICATION		
1	Unified Storage system should support remote replication for both file and block. For optimal usage of bandwidth and to reduce operating expenses remote replication should provide compression/WAN optimized replication through any additional hardware or software and should be provided along with replication solution. Replication solution should also offer storage baselining for initial replication. The proposed solution should support the mentioned features and be able to provide this at a later stage as per requirement.		
2	Synchronous and asynchronous replication with 2/3-way topology should be supported.		
3	The solution should support replication in cascade, one to many and many to one mode.		
4	The replication solution on storage shall support failover to DR storage and failback as and when required.		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
5	If licensed separately, necessary licenses for asynchronous replication for entire supplied capacity with above features to be included.		
0	OTHER FEATURES		
1	The unified storage should be supplied with rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided and installed by the vendor.		
2	The storage array should support user security mechanisms like AD, LDAP and NIS.		
3	Should support minimum 100K subdirectories/files in a single directory.		
4	The unified storage shall have the ability to expand LUNS/Volumes on the storage online and instantly. The LUN allocation will be done by the Bank as and when required.		
5	The storage should support data tiering with real-time movement of hot data to high performing drives. It should offer the capability to move data between one tier of drives to another tier of drives.		
6	The storage array should allow firmware up-gradation for functionality improvement and enhancements. Must support non-disruptive upgrade of core software.		
7	The proposed storage array must support data at rest encryption offering industry standard certification/compliance. The storage array may implement data at rest encryption using self encrypting drives or controller based functionality there by		

Sr. No.	Required Minimum Specifications	Bidder's Compliance (Yes/No)	If yes, detail description how the solution/component would be compliant
	not impacting performance and should be able to provide this functionality at a later stage as per requirement.		
8	The storage array must provide virtual / thin provisioning. If licensed separately, necessary licences for entire capacity to be included.		
9	Must support tape drives/libraries like LTO-3/4/5/6 and VTL for backup/restore/archival purposes through NDMP protocol and should not flow on production LAN.		
10	All the licenses on the storage system must be provided for an entire supplied capacity from day one.		
11	Should supply all necessary cables, interfaces, cards, drivers or any other hardware/software component required to integrate the offered storage solution with the existing setup to make it fully operational.		
12	Should have support for a minimum period of 5 years from the date of announcement of end of sale/end of life.		