Annexure 10–Scope of Work

A. Project Scope

Bank has requirement of NAS Storage. 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, Commission, Installation, Configuration and Maintenance of NAS Storage. The services covered as part of the vendor includes, but not limited to the following:

- Supply, Installation & Maintenance of NAS Storage as per Bank's requirement with coordination of Bank's identified teams at Bank's identified location.
- The NAS Storage should be supplied with 3 years OEM comprehensive Onsite Warranty and 2 years OEM comprehensive Onsite AMC for both hardware and software (24x7 support).
- Bank reserves the right to shift the NAS Storage to new location/s services will continue to be in force at the new location.
- The Successful vendor should have support for a minimum period of 5 years from the date of announcement of end of sale/end of life.
- 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 NAS Storage and add on components, which are approved by the bank.
- Break-fix support of supplied NAS Storage 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 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 supplied hardware.
- 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.

- 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.

- 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 NAS Storage should be in the form of hardware box and should comply with technical specification given below. If the make and model proposed by the vendor do not comply with technical specification given below for NAS Storage, the vendor would have deemed not to be meeting the Technical requirements hence will be disqualified in technical bid evaluation.

Technical Specification for Network Attached Storage			
Proposed Make: ………………………………………………………………………………………			
Proposed Model: ………………………………………………………………………………………			
S.No.	**Specifications Required**	**Bidder's Compliance (Yes/No)**	**If yes, detail description how the solution/component would be compliant**
1	The Network Storage System (NAS) must be dedicated appliance with optimized & integrated single Operating System which should not be a general purpose OS such as Windows/Linux etc.		
2	The system should be proposed with a minimum of 4 controllers interconnected with redundant cluster interconnect 10 Gbe Ethernet or infiniband switches **or equivalent** only. The proposed system must have capability to Scale up & also Scale out upto a minimum of 8 controllers in the		

	same cluster in active-active configuration.		
3	Any LUN allocation/creation 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 should be supplied with a total **400 TB** usable capacity with minimum 10K or higher RPM SAS Drives excluding all overhead configuration like RAID (RAID 6 or equivalent) configuration, formatting and hot spare disk. An additional minimum **40 TB** usable capacity excluding all overhead has to be provisioned in the proposed array on SSD's to be used for caching /tiering if required. The Storage system should deliver minimum 1 Lac IOPS(70:30 R /W Ratio) on Day 1 with the capacity proposed and if any performance degradation occurs additional SSD's to be factored to meet the performance **requirement.** Licenses to enable policy based tiering across SAS and SSD tier should be provided for proposed capacity. **Performance has to be measured through IO Meter for proposed solution.**		
6	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.		
7	The proposed Storage System should support atleast **900 drives** on Day 1. The system should be capable to scale to atleast 1000 TB and 2 lakh IOPS.		

8	The proposed storage should support XTS-AES-256 encryption and has to be integrated with KMIP compliant **(1.1 or higher)** external key manager. All necessary licenses to support this should be included in the proposed storage.		
9	The proposed hardware should have rack mounted form-factor modular design to support disk drives expansion with 4 ports for Backend disk connectivity. Each port should have min. 4 lanes @ 12 Gbps/lane.		
10	The storage controller nodes should have active-active and failover capabilities. Storage should have **minimum 128GB or higher** on-board Protected cache per Controller. The controllers/Storage nodes should be upgradable seamlessly, without any disruptions/downtime to production workflow for performance, capacity enhancement and software/firmware upgrade.		
11	The proposed storage should perform write cache mirroring for data availability. The cache mirroring should happen over dedicated paths/bus between the controllers.		
12	The stoarge system should be configured with minimum 4 * 16 Gbps FC , 4 * 10Gbe SFP+ ports per controller. The system should have minimum 4x 12Gbps SAS backend ports **per controlle**r. Replication ports of 10/1 Gbe to be provisioned separately.		
13	The Proposed Storage System should support all latest operating system (Linux/Unix/Windows) and cluster environments. The storage solution should support virtual infrastructure (like VMware / Hyper-V etc). Should have capabilities for booting VMs from the storage. Should be supplied with virtualization aware APIs for provisioning and managing the storage array from the virtual infrastructure.		

14	The proposed storage system should support protocols like FC, iSCSI, NFS,CIFS, NDMP, SNMP, LDAP and NTP synchronization		
15	The proposed storage system should support various hardware industry standard RAID levels (1,10,5,6) or equivalent.		
16	The multi-pathing software should provide multi-pathing from all leading OS OEM's (Microsoft/ HPE/ IBM/ RedHat/ Oracle/ VMware etc.).		
17	The Storage System should be able to protect the data against single point of failure with respect to controller, disks, cache, connectivity interfaces, fans and power supplies. Storage should support non-disruptive online microcode upgrades, component replacement of controller disks, cache, fan, power supply etc. Multiple redundant path within the storage subsystem should be easily configurable (active- active and active-passive).		
18	There should not be more than 12.5% degradation of performance in case of any component or controller failure in the storage.		
19	The proposed storage array systems must natively support automated SubLUN 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/NL-SAS) with independent RAID types.		
20	All the necessary software to configure and manage the storage space, RAID configuration, logical drives allocation, snapshots etc. should be provided with required licenses. Single Command and GUI and Integrated Web Console for entire storage system for configuration, managing and administration and associated functionalities including deployment,		

	automation, provisioning should be available. Should provide the functionality of proactive monitoring of Disk drive and Storage system for all possible disk failures. Should be able to create instantaneous or Point in Time Snapshot copies of volumes which can be either a full clone or incremental snapshot of the volumes.		
21	Software licenses for features like - Thin Provisioning, Compression, deduplication, Multi-Tenancy, Snapshot, Quality of Service Software for performance to be included for from day one for the total supplied capacity.		
22	The proposed Storage System should include license for storage based asynchronous and synchronous replication for the entire supplied capacity.		
23	The storage array must have complete cache protection using mechanism like mirroring/ destaging/ coherency. Also provide complete cache data protection with battery backup for up to minimum 48 hours or by destaging to flash/disk. The data shall not be lost in the case of power failure.		
24	The storage system must provide capability to use SSD/Flash as an extended/secondary cache scalable upto **40TB** in a single cache/tiering pool.		
25	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 avaliable.		
26	The storage system should have the requisite licenses for the proposed capacity to create point-in-time snapshots. The storage should support minimum 250 snapshots per **volume/LUN.**		

27	The storage should support both local users and groups and directory server users and groups for authentication and authorization. **The storage should have quota on volume and directory** and can be integrated with Data centre Active directory or LDAP solution. NAS protocols should be supported & provided for full scalable usable capacity of 1000 TB and beyond in future.		
28	All the above mentioned licences should be provided from day one for complete configured capacity. All required cable, passive component and connectors to be supplied as part of the solution.		
29	Storage system should natively support policy based data movement/tiering between different storage disk tiers.		
30	Must support different tape drives/libraries like LTO-3/4/5/6/7/8 and VTL for backup/restore/archival purposes through **NDMP or other equivalent protocol** and should not flow on production LAN.		
31	**OEM shall suitably and adequately training the banks and it's MSP team for fully and effectively manning,operating and maintaining the storage devices. All the trainings that Bank feels are necessary to be imparted to the bank or it's designated personnel.**		
32	**OEM need to provide for commissioning and smooth functioning of the equipments. This will include site requirements, power, cables, connectors, network cards/ports,UPS, environmental conditions, illumination etc.**		