| Annexure 10B - Enterprise Storage Specifications | | | |
|---|---|---|---|
| Quantity required: Mumbai - 1 No (Optional) , Hyderabad - 1 No. | | | |
| **SL No** | **Requirement** | **Bidder's Compliance (Yes/No)** | **If yes, detail description how the solution/component would be compliant** |
| **Technical Specifications** | | | |
| 1 | The storage array should support industry-leading Operating System platforms including: Windows 2008, Windows Server 2012, OpenVMS, Solaris, HP-UX, IBM-AIX, Linux and Non-stop OS. | | |
| 2 | The storage array should support multiple clusters of various operating systems mentioned above. | | |
| 3 | The storage array should be based on end to end minimum of 6Gbps technology and should have no single point of failure | | |
| 4 | The Storage Array should have a bladed switched architecture with separate front end boards**/adapters** (configured in pairs) and separate backend boards/**adapters** (configured in pairs). | | |
| 5 | Offered storage array architecture shall be based on latest generation technology of minimum PCI-e 3rd generation (Gen -3) at least for Front-end and Back-end ports connectivity for faster communication. | | |
| 6 | Offered Array shall be scalable to minimum of 6 PB capacity and shall be scalable to at-least 2200 drives. | | |
| 7 | Offered Storage shall be supplied with 307TB RAW capacity using 6.4TB FLash drives for production purpose with the target IOPS of 250K IOPS at 2 millisec response time. | | |
| 8 | Offered Array shall support SSD / Flash, SAS and SAS MDL drives in the array. Storage array shall support various SAS capacity drives of 300GB, 600GB, 900GB & 1.2TB and SAS / SAS-MDL capacity of 4000GB | | |
| 9 | Offered Storage shall support various SSD / flash capacity of 1.6TB / 3.2TB / 6.4 TB etc. | | |
| 10 | The Storage System should have minimum of 512GB of Cache and should be scalable to 2048 GB Cache. The write cache must be mirrored to avoid any data loss in case of a failure. If Storage system architecture also requires read mirroring in cache, minimum 768 GB cache should be offered. Cache scalability of 2048 GB means sum of cache memory supported by all the Storage controller in the system. Cache memory of any other device will not be considered to calculate the cache memory of the storage system. | | |
| 11 | Every offered frame shall have 19" rack footprint and shall support minimum of 380 numbers of small form factor 2.5" drives to reduce power and space requirement. | | |
| 12 | There shall be no single point of failure into the array system including Power Supplies, Cache, Cache boards, Front-end Boards, Backend Boards etc. | | |
| 13 | The storage array should be based on an internal cross bar architecture or switched architecture. | | |
| 14 | The Storage Array must have a minimum of 64 x 16Gbps front-end FC ports for host connectivity. The array must be expandable to at least 128 x 16Gbps or more front-end ports for future expansion. | | |
| 15 | Offered Storage array shall also support ISCSI and FCOE ports. | | |
| 16 | Offered storage shall be supplied with minimum of 64 or higher back-end lanes and shall be scalable to 128 SAS lanes. Overall back-end bandwidth of all the supplied lanes shall be 384Gbps and shall be scalable to 768Gbps. | | |
| 17 | Storage Array shall support Raid 1, Raid 0+1, Raid 5 and Raid 6 **or equivalent.** | | |
| 18 | Storage Array shall support both Spanning and Striping of volume across minimum of 32 channels. | | |
| 19 | Cache shall have de-staging feature to dedicated SSD / Flash module in case of power failure or power blackout. Overall traffic across cache boards shall be minimum hence cache scalability shall be achieved with maximum of 2 frames. | | |
| 20 | Storage array shall be configured with at-least 1 global hot spare drives for 24 Data Disk drives and drives shall be applicable to entire array than disk shelves. | | |
| 21 | Storage array shall have aggregate scalable data bandwidth of 512GB/sec or more. | | |
| 22 | The Storage solution should be architected to provide with 100 percent redundancy in the end to end solution | | |
| 23 | The Storage system should be configured with GUI-based Storage Management Software Tools for Management. A single command console should be used for the entire storage system | | |
| 24 | Storage system should support at least 3 Point in Time copies within the same storage system for a given production volume. | | |
| 25 | Storage system should have a support of virtualization engine which can allow consolidation of third party fabric based storage system as a Single array without using any client software or dedicated appliance for Production systems. | | |
| 26 | Storage subsystem shall allow creation of hardware or Firmware based business copies on third party fabric based storage system without loading any client software or dedicated appliance for production systems. Business copies shall support both full copy and incremental operations. Minimum 200TB License for Snapshot and Clone software should be included. | | |
| 27 | Offered Storage shall support minimum of 64K volumes with and without virtualization. | | |
| 28 | The storage system shall provide thin provisioning support which allows creating the volumes of bigger size than available capacity. | | |
| **Reliability and Availability** | | | |
| 29 | The storage system should support non-disruptive component repair and hot replacement of Interfaces, Disk Controllers, Disk Drives, Cache memory cards, Power Supplies & Battery systems, Fan subsystems, Micro-code. | | |
| 30 | The storage system should support automatic detection of errors, error logging and notification. | | |

| SL No | Requirement | Bidder's Compliance (Yes/No) | If yes, detail description how the solution/component would be compliant |
|---|---|---|---|
| **Technical Specifications** | | | |
| 31 | The Storage System should be the latest generation Enterprise Storage product providing enterprise class data availability, supporting zero data loss 3-way DR replication natively without external appliance with 100% supporting existing XP/P9500 storage deployed at Bank of Baroda. 20TB License of Storage Replication Software should be included. | | |
| 32 | The Storage System should have no singlepoint-of-failure architecture, and must support non-disruptive firmware upgrades, online component replacements and upgrades. | | |
| 33 | The storage system should support Pro-active maintenance – self monitoring, self diagnosing and wherever possible, self repairing features. | | |
| 34 | The storage system should support data replication from One storage system to another storage system without any server intervention. | | |
| 35 | Storage/Virtualization Appliance must support point-in-time full copies and snapshots. Storage must Support up to 5 full (clone) copies within the storage. Preferably all the clone copies should support incremental resync after the initial full sync. Vendor to provide details on capabilities like Data Protection, Replication, DR. | | |
| 36 | The Storage system should be configured with HBA Load Balancing & Auto Failover software. | | |
| **Management** | | | |
| 37 | The Storage system should have storage management utilities that help in administering the storage. A single storage management console should be used for all storage management related activities. It should support the following: | | |
| 38 | A centralized extensive monitoring, configuration and management of storage components and its connectivity components via a single console. | | |
| 39 | Ability to monitor the status, performance and configuration with utilization. | | |
| 40 | The Storage management software should provide real time monitoring, and historical analysis of storage performance and capacity such as total no. of IOPS, read/write %, cache hit %, throughput etc for analyzing the performance of the system. The Storage System should have tamper proof audit log for recording all service/maintenance and host log actions on the storage. | | |
| 41 | Ability to collect, store and analyze storage performance data. | | |
| 42 | Should have the flexibility to allow the users to set up, enable, delete and remove remote copy volumes, repairs and internal hardware copy volumes. | | |
| 43 | The Storage System should be able to automatically detect errors, log errors, and send alert notification through SNMP, SMTP, FTP. Storage must allow integrating with standard Enterprise Management Software tools. Storage must be enabled with automatic support call generation in case of a failure. | | |
| 44 | The Storage System should support automatic isolation of failed components | | |
| **Integration and co-existence** | | | |
| 45 | The storage proposed should support the existing storage replication architecture as well as provide investment protection by leveraging the existing storages in NDR and DR. Bank is using XP/P9500 storages for DC/Nearsite. | | |
| 46 | The storage array should support Bank's Operating System platforms including: Windows 2008, *Windows Server 2012* , OpenVMS, Solaris, HP-UX, IBM-AIX, Linux and Non-stop OS. | | |
| 47 | The storage array should support multiple clusters of various operating systems mentioned above. | | |
| **Migration** | | | |
| 48 | Proposed Storage array should support Online Migration of critical Applications hosted in Enterprise Unix Platforms like Domestic CBS and 23 CBS instances of international Territories. | | |
| **Product Support** | | | |
| 49 | Proposed Storage array should be configured with Highest Level of support for 3 Years with 6 hours Call To Resolution (CTR). | | |
| 50 | Dedicated Account Support Manager should be assigned for Support related aspects. | | |

***Note: Bank has the discretion to ask the bidder to demonstrate the Bank's existing setup as a part of POC with the proposed Product. The bidder can demonstrate the setup at Bidder/OEM lab or in a customer environment.***

| Annexure 10C - SAN Director Specifications | | | |
|---|---|---|---|
| Quantity Required: Mumbai - 2 Nos, Hyderabad - 2 Nos | | | |
| **Sr. No.** | **Specifications** | **Bidder's Compliance (Yes/No)** | **If yes, detail description how the solution/component would be compliant** |
| **Architecture/Scalability/Performance:** | | | |
| 1 | Each SAN switch shall be offered with **minimum** 512 ports and shall be scalable in Non-blocking architecture in a single domain concurrently active at16 Gbit/sec full duplex with no oversubscription with local switching. Switch should also support 4 Gbit/sec. | | |
| 2 | Switch should support multiprotocol architecture such as FC, FICON, FCR and FCIP. | | |
| 3 | 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. | | |
| 4 | At least dual switches shall be provided in no single point of failure configuration. | | |
| 5 | Support auto-sensing 4, 8, and 16 Gbit/sec capabilities. | | |
| 6 | Switch must support local switching on port card to provide point to point line rate throughput. | | |
| 7 | The switch shall support different port types such as U_Port, F_Port, E_Port, D_Port and EX_Port **or equivalent ports.** | | |
| 8 | Cascading of two SAN switches should be possible **with dedicated ports without using the ports available for host connectivity.** | | |
| 9 | The switch should provide local switching feature with port to port latency of less than **800ns.** The switching latency of the backplane should be less than **2.3 microseconds.** | | |
| 10 | The SAN Switch should be capable of supporting HW Compression for FC-IP functionality and IPSec encryption. | | |
| **Intelligent Networking:** | | | |
| 11 | Offered SAN switch shall support services 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. | | |
| 12 | The switch shall be able to support Inter Switch Link (ISL) trunking with New Blade SAN Switches along with existing Brocade SAN Switches deployed at Bank. License for ISL should be part of the New Switches. The ISL trunking between the new switches and the existing switches should be interoperable and supported by existing switch vendor. | | |
| 13 | Offered SAN switch shall support to restrict data flow from less critical hosts at preset bandwidths with ingress rate limiting in Mbps starting from minimum 400Mbps to maximum 16Gbps. This should be done nondisruptively to the connected devices. | | |
| 14 | It should be possible to configure any port in the switch for Fibre Channel Integrated Routing mode for selective device sharing while maintaining remote fabric isolation for higher levels of scalability and fault isolation. | | |
| 15 | It should be possible to isolate the high bandwidth data flow traffic to specific ISLs by using simple zoning. | | |
| 16 | Offered SAN switches shall support to measure the top bandwidth-consuming traffic in real time for a specific port or a fabric which should detail the physical or virtual device. | | |
| **Management/Security:** | | | |
| 17 | Support for web based management and should also support CLI. | | |
| 18 | The switch shall support advanced zoning and RBAC to simplify administration and significantly increase control over data access. | | |
| 19 | Offered SAN switch shall support to configure the switches with alerts based on threshold values for temperature, fan status, Power supply status, port status. | | |
| **Availability/Maintenance/Troubleshooting:** | | | |
| 20 | There should not be single point of failure for the switch. The SAN switch should provide Enterprise-class availability features such as Dual-redundant control processors, redundant hotswappable power and cooling subsystems. Power supply and fan assembly should have different FRU. | | |
| 21 | The switch should be rack mountable. | | |
| 22 | Non disruptive Microcode/ firmware Upgrades and hot code activation. | | |
| 23 | Switch shall support POST and online/offline diagnostics, including RAStrace logging, environmental monitoring, non-disruptive daemon restart, FCping and Pathinfo (FC traceroute), port mirroring (SPAN Port). | | |
| 24 | Offered SAN switch shall be energy efficient and shall consume less than **5KVA** of power, when fully populated. | | |
| 25 | The proposed switch should support offline diagnostic including optical and electrical loop back , latency, link traffic, distance. | | |
| 26 | The proposed SAN switch should support forward error correction and buffer credit recovery. | | |
| **Integration and Co-existence** | | | |
| 27 | Setting of the port speed to 4Gbps or 8Gbps should not impact or disable the other ports in the same port blade or port group. | | |
| 28 | It should support inter-operatability between existing Brocade SAN fabric. | | |
| 29 | It should support heterogeneous server technologies and its host bus adapters. | | |
| **Implementation and Migration - Planning** | | | |
| 30 | **Implementation plan should be submitted by Bidder considering the following**<br>Assessing the existing fabric topology ( individual Fabric Details<br>Device Details, Device Mapping Details,Application Specific Details)<br>Assessing the new fabric topology<br>Logistic planning for hardware installation<br>Topology and zone planning<br>Preliminary migration planning | | |
| **Implementation and Migration - Execution** | | | |
| 31 | Rack, cable, and power on the destination fabric. | | |
| 32 | Set up Ethernet and serial console for the switches. | | |

| Sr. No. | Specifications | Bidder's Compliance (Yes/No) | If yes, detail description how the solution/component would be compliant |
|---|---|---|---|
| **Architecture/Scalability/Performance:** | | | |
| 33 | Install recommended FOS. | | |
| 34 | Create the baseline configuration for all switches in the fabric. | | |
| 35 | Install Management tools. | | |
| 36 | Import zoning configuration from existing SAN Fabrics. | | |
| 37 | Install any fabric licenses. | | |
| 38 | Purge any zones that are no longer in use. | | |
| 39 | Create zones for new devices. | | |
| 40 | Validate the ISLs. | | |
| 41 | **Carryout the migration using the following methods**<br>**Device migration:** This is a logical approach to offline migration, since physically isolate servers and storage devices in racks or sections of the data center. Migrating devices using this method provides a clear high-level accounting, especially for the racks that are relocated as part of the migration.<br><br>**Port-to-Port migration:** This is a straightforward port-port migration from one fabric to another. This method requires all logically grouped initiator/target pairs to be moved during a single migration activity. This strategy is generally called migrating by “move groups.” For example, when a storage port is moved, all associated Host Bus Adapters (HBAs) that are accessing LUNs through this port must also be moved.<br><br>**Application migration:** This is possible if the physical infrastructure is not shared across application tiers. If the application happens to run on a new server and storage infrastructure, you should validate that all the required data has been migrated prior to the cutover. SANs tend to be logically identified as database, web services, backup, and so on. | | |
| **Support Service** | | | |
| 42 | Proposed Storage array should be configured with Highest Level of support for 3 Years with 6 hours Call To Resolution (CTR). | | |

***Note: Bank has the discretion to ask the bidder to demonstrate the Bank's existing setup as a part of POC with the proposed product. The bidder can demonstrate the setup at Bidder/OEM lab or in a customer environment.***

## Annexure 10D - Blade SAN Switch Specifications

**Quantity Required: Mumbai - 12 Nos, Hyderabad - 12 Nos**

| Sr. No. | Specifications | Bidder's Compliance (Yes/No) | If yes, detail description how the solution/component would be compliant |
|---|---|---|---|
| **Architecture/Scalability/Performance/Management:** | | | |
| 1 | Minimum Dual SAN switches shall be hot-plugged into the back of the HPE BladeSystem C-Class where each SAN switch shall be configured with minimum of 24 ports; 16 Internal with 8 x 8Gbps External Ports configured with SFPs. | | |
| 2 | Required scalability shall not be achieved by cascading the number of switches and shall be offered within the common chassis only. | | |
| 3 | Should deliver 8 Gbit/Sec Non-blocking architecture with 1:1 performance for up to 24 ports in an energy-efficient fashion. | | |
| 4 | Should protect existing device investments with auto-sensing 2, 4, and 8 Gbit/sec capabilities. | | |
| 5 | The switch shall support different port types such as F_Port, and E_Port; optional port type control in Access Gateway mode: F_Port and NPIV-enabled N_Port. | | |
| 6 | The switch shall be hot-plugged into the back of the HPE BladeSystem C-Class not consuming any additional RACK Space. | | |
| 7 | Non disruptive Microcode/ Firmware Upgrades and hot code activation. | | |
| 8 | The switch shall provide Aggregate bandwidth of 192 Gbit/sec: 24 ports × 8 Gbit/sec (data rate) end to end. | | |
| 9 | Switch shall have support for web based management and should also support CLI. | | |
| 10 | The switch should have USB port for firmware download, support save, and configuration upload/download. | | |
| 11 | Switch shall support POST and online/offline diagnostics, including RAStrace logging, environmental monitoring, non-disruptive daemon restart, FCping and Pathinfo (FC traceroute), port mirroring (SPAN port). | | |
| **Intelligent Networking:** | | | |
| 12 | Offered SAN switch shall support services 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 | | |
| 13 | The switch shall be able to support ISL trunk up to 64 Gbit/sec between a pair of switches for optimal bandwidth utilization and load balancing. | | |
| 14 | The Switch should be configured with Zoning and shall support ISL Trunking features; **Trunking License per SAN Switch should be included.** | | |
| 15 | It should support inter-operatability between existing Brocade SAN fabric supporting Brocade Access Gateway mode where the device must also be connected to an NPIV-enabled edge Switch or Director. | | |

| Annexure 10E - Mid Range Storage Specifications | | | | |
|---|---|---|---|---|
| Quantity Required: Mumbai - 1 No, Hyderabad - 1 No | | | | |
| **Sr. No.** | **Paramater** | **Functionality** | **Bidder's Compliance (Yes/No)** | **If yes, detail description how the solution/component would be compliant** |
| 1 | Converge / Unified Storage | 1. Offered Storage array shall be a true converge / unified storage with a single Microcode / operating system instead of running different Microcode / Operating system / Controllers for File, block and object services respectively.<br><br>2. Offered Storage array shall be end-to end 12Gbps enabled which means that both Front-end Fibre channel ports and Back-end engines shall be operated at minimum 12Gbps speed.<br><br>3. Offered Storage Array shall be supplied with minimum of Quad Crossbar Engines / Quad controller node / Quad controller engine or equivalent and shall be scalable to at-least 8 Crossbar engines / Controller nodes. | | |
| 2 | Operating System & Clustering Support | The storage array should support industry-leading Operating System platforms including: *Windows Server 2012 / 2016, VMware, Solaris, HPE-UX and IBM-AIX etc.* | | |
| 3 | Capacity & Scalability | 1. The Storage Array shall be offered with minimum 4 controllers on Day 1 with 100% controllers scalability for future growth.<br><br>2. The Storage Array shall be offered with **200TB** RAW Capacity using 3.84TB SSD / Flash drives and **400TB** RAW Capacity using 1.8 TB SAS 10K based spinning drives.<br><br>3. Offered Array shall be scalable to at-least minimum of 2300 numbers of Drives and shall be scalable to more than 9PB of raw capacity. | | |
| 4 | Cache | 1. Offered Storage Array shall be given with at least 1.2TB cache in a single array for both Data and control operations and shall be scalable to 2.5TB DRAM Cache.<br><br>2. Cache shall be used only for Data and Control information. OS overhead shall not be done inside cache.<br><br>3. Offered Storage shall also be offered with additional 4TB usable Flash cache using SSD / Flash drives in Raid 1+0 and shall be scalable to more than 30TB Flash cache.<br><br>4. If Flash cache is not supported inside the storage array then vendor shall supply the storage array with at least 2TB of DRAM cache. | | |
| 5 | Processing Power | 1. Offered Storage architecture shall be based on purpose built ASIC, XOR engine so that there shall be no load on the storage CPU during Raid Parity calculations. Vendors shall provide the documentary proof for same.<br><br>2. In case vendor doesn't have above ASIC functionality then additional 128GB cache shall be supplied for read and write operations to balance out the performance. | | |
| 6 | Architecture & Processing Power | Offered Storage array shall be true active-active so that a single logical unit can be shared across all offered controllers in symmetrical fashion, while supporting all the major functionalities like Thin Provisioning, Data Tiering etc. | | |
| 7 | No Single point of Failure | Offered Storage Array shall be configurable in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc. | | |
| 8 | Disk Drive Support | 1. The storage array should support dual-ported 300 / 600 / 1200 / 1800GB hot-pluggable Enterprise SAS, Minimum 400 GB Solid State drives and SAS - NL of 2TB / 4TB / 6TB / 8TB drives.<br><br>2. Offered Storage array shall be truly optimized for flash operations and shall support minimum of 1100 Solid State disks / Flash disks. Offered Array shall be scalable to at-least 8PB raw capacity using SSD / Flash disks.<br><br>3. All offered SSD / Flash drives shall be provided with minimum of 5 years unconditional warranty. | | |

| Sr. No. | Paramater | Functionality | Bidder's Compliance (Yes/No) | If yes, detail description how the solution/component would be compliant |
|---|---|---|---|---|
| 9 | Raid Support & Virtualization | 1. Offered Storage Subsystem shall support Raid 1, 5 and Raid 6.<br><br>2. Offered storage array shall have native virtualization support so that Raid 1, Raid 5 and Raid 6 can be carved out from a logical space instead of dedicating separate physical disks for each application.<br><br>3. Every supplied disk shall be able to participate into multiple and different RAID sets simultaneously.<br><br>4. In case vendor does not have this functionality, then 20% additional raw capacity shall be provided for each type of disk to balance out the capacity utilization. | | |
| 10 | Data Protection | Incase of Power failure, Storage array shall have de-stage feature to avoid any data loss. | | |
| 11 | Protocols | Offered Storage array shall support all well-known protocols like FC, ISCSI, SMB 3.0, NFS V4, FTP/FTPS etc. natively. | | |
| 12 | Host Ports, Back-end Ports and Volumes | 1. Offered Storage shall also natively support 16Gbps FC ports, 10Gbps ISCSI and 10Gbps NAS (For File operations) ports without using any external device.<br><br>2. Offered Storage array shall be supplied with minimum of 32 x 16Gbps FC ports, 8 x 10Gbps ISCSI ports and 8 x 10Gbps Ethernet ports for File operations. All type of Ports shall be 100% scalable.<br><br>3. Offered Storage shall be supplied with at least 32 x 12Gbps Back-end SAS ports / 128 x 12Gbps SAS Lanes and shall be scalable to more than 64 x 12Gbps Back-end SAS ports / 256 x 12Gbps SAS lanes.<br><br>4. Offered storage shall be supplied with minimum four additional 10Gbps IP ports for storage based replication on Storage array and shall be scalable to at-least 8 x 10Gbps IP ports | | |
| 13 | Host Ports & Back-end Ports Cards | Offered storage shall have separate adapters for Host ports and back-end port cards for better ratio of high availability. | | |
| 14 | Global Hot Spare | 1. Offered Storage Array shall support distributed Global hot Spare for offered Disk drives.<br><br>2. Global hot spare shall be configured as 1 Spare Disk per 24 Data Drives. | | |
| 15 | Performance and Quality of service | 1. Storage shall be provided with Performance Management Software.<br><br>2. Offered storage array shall support quality of service for critical applications so that appropriate and required response time can be defined for application logical units at storage. It shall be possible to define different service / response time for different application logical units.<br><br>3. Quality of service engine shall allow to define minimum and maximum cap for required IOPS / bandwidth for a given logical units of application running at storage array.<br><br>4. It shall be possible to change the quality of service Response time, IOPS, bandwidth specification on basis of real time. | | |
| 16 | Thin Provisioning and Space Reclaim | 1. Offered storage array shall have support for Thin provisioning and Thin Re-claim to make the volume thin for an extended period of time.<br><br>2. Thin Re-claim (Zero Page reclaim) inside storage subsystem shall be automatic in nature and there shall be no need to run any utility inside storage for same.<br><br>3. Thin Re-claim inside storage shall not cause any overloading of Storage CPU and shall be able to claim the Zero pages even during peak load without any performance impact<br><br>4. For better management, Thin Provisioning shall be the native part of configuration instead of creating the separate groups or pools. Vendor shall provide the documentary evidence for same.<br><br>5. For effective capacity utilization, thin reclaim maximum unit shall be 16KB. Vendor shall provide the documentary proof for same.<br><br>6. Offered storage array shall be tightly integrated with VMware so that Eager Zero disk layout can be used with thin provisioning and thin re-claim.<br><br>7. Offered Storage array shall be certified with VMware V-VOL and shall support more than 100,000 volumes on the Storage Array. | | |
| 17 | Maintenance | Offered storage shall support online non-disruptive firmware upgrade for both Controller and disk drives. | | |

| Sr. No. | Paramater | Functionality | Bidder's Compliance (Yes/No) | If yes, detail description how the solution/component would be compliant |
|---|---|---|---|---|
| 18 | Snapshot / Point in time copy / Clone | 1. Offered Storage shall have support to make the snapshot and full copy (Clone) on the thin volumes if original volume is created on thick or vice-versa.<br><br>2. The storage array should have support for both controller-based as well as file system based snapshots functionality (At-least 1024 copies for a given volume or a file store).<br><br>3. Storage array shall have functionality to re-claim the space from Thin Provisioned Deleted snapshot automatically. Vendors shall provision at-least 20% additional space over and above the actual requirements, if space re-claim from thin provisioned deleted snapshot is not possible automatically. | | |
| 19 | Quota Management and Antivirus Scanning | 1. For file services operations, offered storage shall support both user level as well as file level hard and soft quota.<br><br>2. For file services operations, offered storage shall support integration with industry leading antivirus vendors like Symantec, Trend Micro and MacAfee. | | |
| 20 | Storage Array Configuration & Management Software | 1. Vendor shall provide Storage Array configuration and Management software.<br><br>2. Software shall be able to manage more than one array of same family. | | |
| 21 | Storage Tiering | 1. Offered storage shall support dynamic migration of Volume from one RAID set to another set while keeping the application online.<br><br>2. For effective data tiering, Storage subsystem shall support automatically Policy based Sub-Lun Data Migration from one Set of drive Tier to another set of drive Tier.<br><br>3. Offered storage array shall support Sub-Lun data tiering for both FAT and thin provisioned volumes. | | |
| 22 | Remote Replication | 1. The storage array should support hardware based data replication at the array controller level across all models of the offered family.<br><br>2. The Storage array shall also support three ways (3 Data Centers) replication to ensure zero RPO natively without using any additional replication appliance.<br><br>3. The storage array shall support incremental replication after resumption of Link Failure or failback situations. | | |
| 23 | File Level retention and immutability | 1. For file services operation, offered storage shall support file protection against accidental, premature, malicious deletion and modification of data using file locking mechanism of WORM and Legal hold.<br><br>2. Apply of legal hold shall ensure that File cannot be moved, modified, or deleted regardless of the retention period. | | |
| 24 | Licenses | Storage subsystem shall be supplied with Thin Provisioning, Snapshot, Clone, Performance Monitoring, Online Raid Migration, Online Volume conversion (thin to thin compressed, thin to thin de-dup etc.), Quality of services, Sub-Lun Tiering and File services on day 1 for the maximum supported capacity of array. | | |
| 25 | Integration and co-existence | The Storage Subsystem should have capability to move data from existing 3PAR Storage Array to proposed array online without any application downtime. The required hardware and software should be proposed with the array. | | |
| 26 | Storage virtualization and Federation | The proposed storage array and its software tools support load balancing at will wherein, movement of data and workloads between arrays is initiated without impacting applications, users or services . | | |
| 27 | Support Services | Proposed Storage array should be configured with Highest Level of support for 3 Years with 6 hours Call To Resolution (CTR). | | |

***Note: Bank has the discretion to ask the bidder to demonstrate the Bank's existing setup as a part of POC with the proposed product. The bidder can demonstrate the setup at Bidder/OEM lab or in a customer environment.***