Annexure - II

TECHNICAL SPECIFICATIONS FOR 200 TB USABLE UNIFIED STORAGE SOLUTION			
Proposed Make:			
Proposed Model:			
Sr. No	**Technical Specifications**	**Compliance (Yes/No)**	**Remarks**
A)	**Storage Architecture**		
A.1	The proposed Unified Storage solution should have minimum dual active-active controllers with No Single Point of Failure architecture & 99.999% availability. Proposed storage solution should not exceed 8 RU(Rack Units).		
A.2	It should support all Block and File protocols natively OR by providing addon gateway/controllers in redundant configuration in the same cluster in active-active configuration with host connectivity for FC, iSCSI, CIFS and NFS.		
A.3	Controller should have dual socket CPUs based upon latest generation of Intel family, minimum Skylake series and should be supplied with at-least 32 numbers of CPU cores.		
A.4	The proposed storage solution must be dedicated appliance with specifically optimized OS to provide both SAN and NAS functionalities. The architecture should allow modular upgrades of hardware and software for investment protection. The solution should be suitably configured for achieving enhanced performance and throughput.		
B)	**Cache and Memory**		
B.1	The proposed unified storage must be offered with minimum 192GB cache memory across two controllers and scalable to 768GB or more across controllers , either by adding controllers or upgrading controllers to higher models .		
B.2	It 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.		
B.3	Cache should be protected for Writes either through a battery backup for upto 72 hours or by destaging to flash/disk.		
B.4	The proposed solution must provide capability to use SSD/Flash as an extended/secondary cache currently it should support minimum of 1.2TB Flash/SSD Cache and scalable upto 4 TB in a single cache/tiering pool.		

B.5	**WORM Support:** Storage shall have capability for protecting files from modification or deletion until a specified retention date to create a permanent, unalterable set of files and directories and ensure the integrity of data. WORM capability should comply to SEC 17a-4(f) standards.		
C)	**Front-end and Back-end Connectivity**		
C.1	The proposed storage should be unified ie., it should have SAN and NAS protocols configured from day one with single micro-code to deliver these services.		
C.2	Front-end Ports: It should be configured with minimum 08 x 32Gbps FC ports and 08 x 10 GbE or higher speed ports across controllers to provide scalable and dedicated connectivity to hosts and for remote replication.		
C.3	Back-end Ports: It should be configured with minimum 4 x 12Gbps SAS backend ports across Dual controllers.		
C.4	The proposed storage should be connected to the servers through SAN switches in High Available Configuration. All necessary cables for connecting the storage with switches are to be supplied.		
D)	**RAID and Data Protection**		
D.1	It should support all Industry Standard RAID levels including 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. RAID 6 is prefereable		
D.2	It should support detection of silent data corruption by doing parity checking on write and read operations both. Solution should also support fixing of corruption in case of parity mismatch. Solution should provide safeguard against data errors due to disk failure, unrecoverable read errors and network induced errors.		
D.3	The proposed storage solution should be configured to provide data protection against two simultaneous drive failures.		
D.4	The proposed storage solution should have the capability to support Non-Disruptive Data migration across volumes. The Storage solution should be configured with host multi-pathing drivers.		
E)	**Scalability and Upgradability**		

E.1	The proposed storage solution must support intermixing of SSD/NVMe SSD, SAS/NL-SAS drives to meet the capacity and performance requirements of the applications. The solution must support a minimum of 600 disks (min. 300 SSD disks and rest SAS/NL-SAS disks) in a dual controller architecture irrespective of any form factor i.e. 3.5" and 2.5" without any controller upgrade. Required hardware and software feature licenses to meet scalable capacity for all protocols should be offered from day one.		
E.1	The proposed solution should be a true Scale-up OR Scale-out architecture allowing mixing of Controller/Nodes within same product line with higher configurations.		
F)	**Capacity Requirements**		
F.1	The proposed storage solution should be supplied with 200 TB usable capacity and scalable upto 2 PB in a dual controller architecture. The required capacity should be supplied using 40 TB in SSD/NVMe SSD/NVMe SSD pool , using maximum of 4TB SSD/NVMeSSD & 160 TB in NL-SAS pool after RAID6 configuration using maximum of 16TB NL-SAS drives. License feature to enable policy based tiering across SSD and SAS tier should be provided from day one.		
G)	**Protocols Support and Data Services**		
G.1	It should support industry standard Protocols like NFS, CIFS (SMB), FTP, FC and iSCSI etc and also support vVOLs.		
G.2	It should support Storage Analytics, Snapshots for block and file, Remote Replication (sync & async) for block and file & Data-at-Rest-Encryption features. Licenses for these features should be enabled from day one.		
G.3	**Storage Resouce Pooling:** The proposed solution should support mixing of different tiers of disk media like SSD, SAS and NL-SAS in single storage pool for both block and file. Single storage pool should be accessible to both controllers. Proposed storage should also support auto-balacing of capacity across new added disks to avoid any hot spots.		
G.4	**Data Encryption:** It must have storage controller based Data at Rest Encryption solution or SED based encryption to encrypt data on all drives. Solution should be supplied with embedded key management solution or external key management solution with no user intervention.		
G.5	**Scalable File solution:** The proposed storage solution should support traditional (user data) and transactional (e.g. VMware, Oracle) NAS use cases. Proposed storage solution must support creating multiple NAS servers for tenant isolation with each file solution scalable upto 200 TB.		

G.6	**Snapshot:** The proposed storage solution should support snapshot creation using ROW (Redirect on write) algorithm. Storage arrays should have ability to use snapshot as writable volume. Proposed solution should support snapshot scheduler. Proposed storage should allow snapshot replication with different retention for source and destination.		
G.7	The proposed storage solution shall support Synchronous & Asynchronous Replication for both Block and File Protocols.		
G.8	**Quality of Service:** The proposed storage solution should support QoS feature to limit the amount of IO (IOPS) or bandwidth.		
H)	**Storage Management and Diagnostics**		
H.1	**Storage Management Software:** The proposed storage solution should be supplied with native Storage management software with Web based GUI capable of generating reports, real time monitoring, historical performance data for analysis and trending, capacity utilization monitoring. Also there should be a CLI interface as well for cluster management.		
H.2	Management software should provide features like Nonintrusive alerting, Performance and Capacity Reports, Ongoing health check analysis etc.		
H.4	**Cloud Based Monitoring & Reporting:** It should have cloud based monitoring and management tool with support for 1 years of historical reporting. Software should support monitoring and reporing multiple storage solution, VMware environment and SAN switches. Required on-prem software and hardware should be included in the solution. Cloud based software should be accessible from any Internet connected device with mobile application support for iOS and Android.		
H.5	**Simplified Management:** The proposd solution should be simple to setup enabling installation in just a few minutes ; simple to use with an intuitive HTML5 interface with multiple VMware and Microsoft integrations; simple service/support feature that includes a built-in self-service portal with features and capabilities that easily help solution/Storage Administrator to resolve issues faster.		
H.6	Solution should be fully compatible with all standard backup softwares. IUCAA is usig Dell EMC Data Domain 6800 backup infrastructure. Hence proposed solution should be fully compatible to Dell EMC Data Domain 6800. Must support tape drives/libraries like LTO-5/6/7/8/9 and VTL for backup/restore/archival purposes through NDMP protocol and should not flow on production LAN.		
I)	**OS Support**		

I.1	The proposed storage solution should support latest versions of leading operating solutions like Linux (RHEL / SUSE/ Debian/Rocky Linux), MS Windows 2019/2016/2012/2008 etc. The proposed solution shall fully support virtualized environment for VMware, Citrix Xen Server, KVM and Microsoft Hyper-V.		
I.2	It should support all above OS-level Clustering from leading OEM's.		
J)	**Deduplication and Compression**		
J.1	Proposed storage solution should support block level data deduplication and/or compression for all kinds of data (structured & unstructured) on both block and file across SSD/NVMe and SAS/NL-SAS . The hardware and software license required must be provided as part of the solution.		
K)	**Licensing**		
K.1	All the software/hardware licenses of the proposed storage solution must be provided/activated for entire scalable capacity as aksed from day one.		
K.2	The proposed storage should have feature of Ransonware Protection from the dissuptive activity. It should have necessary software natively integrated OR API supported or Third-party integrated.		
L)	**Warranty and Support**		
L.1	The proposed storage solution should have five years comprehensive warranty with 24 x 7 x 365 support. Maximum 4 hours response time and maximum 24 hours resolution. Please mention SLA for part replacement.		
L.2	Warranty starts from the date of successful installation and commissioning.		
L.2	Bidder should provide on-site support during the warranty period. On-site supprt includes quarterly health-checks, troubleshooting issues, reconfigurations, performance optimization, software/firmware updates/upgrades etc.		
M	**Power and Cooling Requirements**		
M.1	As per proposed solution		
N	**Other Features**		
N.1	The proposed storage solution should be supplied with standard 19" rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided and installed by the bidder.		
N.2	**Gartner's Magic Quadrant:** OEM must be listed in leaders quadrant of Gartner Magic Quadrant report for Primary/General Purpose storage for last 3 years and should have minimum 10% market share in India as per IDC data for mid-range storage. Bidder should propose their latest storage models and solutions in response to this RFP.		
N.3	The proposed storage solution should support user security mechanisms like AD, LDAP and NIS.		

N.4	The proposed storage solution shall have the ability to expand LUNS/Volumes on the storage online and instantly.		
N.6	The proposed storage solution should allow firmware up-gradation for functionality improvement and enhancements. Must support non-disruptive upgrade of core software.		
N.7	The proposed storage solution should provide virtual / thin / thick provisioning. If licensed separately, necessary licences for entire capacity to be included.		
N.8	The proposed storage solution should be equipped with all necessary cables, interfaces, cards, drivers or any other hardware/software component.		
N.9	The proposed storage solution should have support for a minimum period of 5 years from the date of announcement of End of Sale/End of Life.		
	The proposed strage solution including subsystems must be current product models from globally reputed OEMs. Obsolete / Near-Obsolete / declared end-of-life models should not be quoted.		
	OEM authorized certification/training program to IUCAA team of 3-4 members to be provided.		
TECHNICAL SPECIFICATIONS FOR SAN SWITCHES x 2 Nos.			
Proposed Make:			
Proposed Model:			
Sr. No	**Technical Specifications**	**mpliance (Yes/**	**Remarks**
1	Minimum Dual SAN switches shall be configured where each SAN switch shall be configured with minimum of 24 Ports x 32 Gbps or higher as per solution requirement. Should deliver 32 Gbps Non-blocking architecture with 1:1 performance for up to 24 ports in a energy-efficient fashion. Should support auto-sensing 16, and 32 Gbps capabilities.		
2	Required scalability shall be offered within the common chassis only and shall not be achieved by cascading the number of switches.		
3	The switch shall support different port types such as FL_Port, F_Port, E_Port, EX_Port.		
4	The switch should be 1U rack (19") mountable supplied with mounting kit.		
5	Should provide enterprise-class availability features such as redundant and hot pluggable/swappable components like power supply,SFP optics, and FAN.		
6	The switch shall provide Aggregate bandwidth of 384 Gbps end to end.		

7	Switch shall have support for web-based management and should also support CLI. Should Support for all standard FC and management protocols like CLI, SNMP, SMI-S. It should support non-disruptive firmware / software upgrades.		
8	Security features like RADIUS or TACACS+ authentication, authorization, and accounting (AAA) functions, SSHv2, SNMP v3, FC-SP for host-to-switch and switch-to-switch authentication, Port security and Management access.		
9	The switch should provide role based administration by allowing different administrators with different access rights.It should prevent unauthorized users from altering the switch configuration.		
10	All required LC-LC cables and SFPs must be provided along with SAN Switch in line with ports populated.		