BOB Financial
Credit reimagined

RFP for Selection of bidder for Delivery Installation Commissioning Maintenance of hardware storage at BFSL DC DR location						
Sr. No.	**Pg No**	**Point No**	**Tender Original Clause**	**Clarification**	**Request for Change / Modification / Addition / Deletion**	**BFSL Response**
1			NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives	What is the current workload of BOBF in Block and File. Application Landscape for the individual workload is (Mandatory).	Application & Workload profile is very important to size the storage and reduce the risk of undersizing or over sizing	130TB Block & 40TB File
2				What %age of workload comprises of File or NAS and what is the throughput BOBF is looking for and @ what %age of sequential Read & write for File use	File throughput performance figures are required in GB/s or Gbps	Approx 60% Block & 40% File
3				What is the Block Performance in IOPs and at what Block size of I/O ? What is the Read/Write ratio ? Any specific parameter for Controller processor utilization to achieve the required IOPs ? What is the latency expected ? Can we have some figures on the No. of Processor Cores required per controller. Industry standard has become 32 Cores per controller minimum for any Enterprise Storage requirement.	Kindly Specify the IOPs required for Block workload and Throughput required for File Workload Block performance @ what %age of controller utilization No. of Processor Cores are required per controller	Refer Addendum
4				What is controller scalability required in future for horizontal and Vertical scalability as asked in the RFP. Do you need the controller scalability in Scale-Out or Scale-Up fashion	No. of Controller Scalability for future and in what form (Scale-Out or Scale-Up)	Scale-Out or Scale-Up Both Features Require.
5				Is there any specific Hard Drive capacity size considered for the required usable capacity of 220TB and 120TB ? NVMe as a technology take minimum RAID rebuilding time hence customer prefers to have a higher capacity drives nowadays. What is the NVMe Drive scalability expected from each Array ?	Kindly specify the NVMe Hard Drive capacity required for sizing the usable capacity and @ what RAID level. Do also mention how many Hot Spare Drives are required per 10/20/30 Drives	Refer Addendum
6				Cache asked is 1.2TB per Array which is not a universal cache size. The universal Cache sizes are like 256GB, 512GB, 768GB, 1024GB, 2048GB. Only NetApp comes with 1280GB of Cache in HA pair of AFF800 so should we assume that this is inclined to a particular model & Brand.	Kindly chage the Cache size to minimum 512GB per controller which will increase the bid participation	1024GB Cache to be considered
7			1.9TB/3.84TB/7.68TB/15.3TB self-encrypting (SED) with AES-256 encryption	Nowadays storage technology has evolved post NVMe adoption with Encryption as a dedicated ASIC hardware unit integrated in the controllers which provides multiple level of encryption security not only on Hard Disk level but also controller level, SED based encryption is limited to Hard Disk only. SED based Encryption does not give flexibility to have not encrypted file data in the same controller.	Kindly remove the self-encrypting(SED) with AES-256 encryption and put "Encryption with Data At Rest" being a common terminology for Encryption and this will also help maximum OEM's to qualify	Good to have.
8			Premium Bundle License Included	Kindly ellaborate this Premium Bundle and the Software components required by BOBF team to operate the Storage	Kindly specify the details of Premium bundle license	All Licenses required for storage to storage replication

9			License for FC, iSCSI, CIFS, NFS, NVMe & NVMe/FC protocol included	This point highlights that BOBF is looking for a Unified Storage Box with all the SAN/NAS access protocols There are always a performance bottleneck on the Controller Cores and Cache when the Block & File workload are mixed impacting the Business Critical workload performance bottleneck and Queing of Transactions in the DB layer creating latency	Requesting BOBF to segregate the Block & File workload to different controllers for better and stable performance	No Change
10			16/32/64 Gbps SAN Switches (Brocade/Cisco)	64G Switch is comparitively costlier being the latest in SAN Fabric offering and does not bring in the regular form of TCO and Cost economy with higher density of Ports. Most of the Storage Vendor is still offering 32G Frontend I/O ports in their controllers.	Requesting you to stick on to 32G SAN Fabric Switches over a choice of 64G Is BOBF is looking for the modular form factor based SAN Switch or Blade Based Director Class Switch ?	Accepted
11			Implementation and Data Migration	Need full information on type of current storage	Requesting you to provide all the information in advance	Current Storage is Shared Storage with no visibility on underlying Storage
12				Volumn Type & Total Volumn		
13				Current Capacity of Data		
14				Server Type		
15				Host OS		
16			Data Migration Page 33	The selected Bidder will assist the company in migration exercise without any cost to the company.	Requesting you to kindly reconsider this. This will cost significant amount	Refer Sr no.1 for size. Vendor expected to facilitate in migraion only from storage perspective.
17	11	11	L1 Bidder must ensure a flawless migration (Infra or Data) from existing setup to New setup as required by BFSL at both PR & DR without any additional cost at both PR and DR sites. The migration plan for both PR and DR to be shared with BFSL for necessary approval.	For Migration of Infra OR Data - Complete Details will be required What all equipments are required to be migrated. Details of existing Storage OEM and Model Host wise details of OS, HBA, Data Type and Data size Total Datasize for Migration at both DC and DR		Refer Sr no.1 for size. Vendor expected to facilitate in migraion only from storage perspective.

18	12	21	Scalability Requirements : a) The Architecture proposed should be Horizontal and Vertical Scalable b) To be scalable as per BFSL's future requirement	For Scalability of Storage certain parameters are required for Horizontal and Vertical Scalability. Like for Horizontal Scalability the Storage solution should be able to have scalability from 2 Controller to 4 controllers just by adding additional controllers and no other equipments like external LAN/Infiniband switches. It should also take care of the existing LUN's to be exposed to all the Four controllers when upgraded from 2 to 4 contollers. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controller.	The proposed storage array should be NVMe based scale-up and scale-out Active - Active architecture. All the hardware and software required to achieve Four Controller Scalability should be included from Day 1 except the Future 2 Controllers. Vendor shall ensure that all controllers, with and without scalability, shall be connected to a common back-plane and shall not use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. When Storage is upgraded from 2 controllers to 4 controllers; all the existing LUNs present should be exposed to all the Four Controllers Symmetrically to have benefit of Four Controllers providing Performance and Availability to all the LUNs and not restricted to only 2 controllers. All the LUNs should be able to see all the FOUR Controllers when upgraded to FOUR Controller Architecture and should not be restricted to Maximum 2 Controllers. All the FOUR Controllers shall be true symmetric 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 etc. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controllers.	There should be no technical limitated on any horizontal and vertical scalability. Any augmentation of space or controller should be seamless and should be able to leaverage all components effectively.
19	1	1	Appendix 2 - Bill of Material NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives	Most of the Storages Vendor offers 512GB of Cache Memory per controller (since Memory modules are availbale in 16/32/64 DIMM sizes and hence request to change it to 1TB Cache Memory across controllers in HA with ACTIVE ACTIVE Controllers. Please clarify whether the 220TB usable capacity ask is with which RAID Level (Suggested is Dual Disk Failure Protection RAID level - RAID 6 or equivalent as minimum) The Usbale Capacity of 220 should be in TiB and not TB.	NVMe Flash Array Configured with two controllers in Symmetric Active- Active HA and shall be scalable to Four Controllers in Symmetric Active- Active HA without using use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. All the hardware and software required to achieve Four Controller Scalability should be included from Day 1 except the Future 2 Controllers. All the LUNs should be able to see all the FOUR Controllers and should not be restricted to maximum 2 Controllers when upgraded to FOUR Controller Architecture. All the FOUR Controllers shall be true symmetric 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 etc. 1TB Cache across controllers - Total Usable - 220TB with all NVMe FIPS Encrypted SSD Drives. Storage Capacity should be RAID 6 or equivalent protecting Dual Disk Failure. Size of RAIDset should not be more that 12 Disk Drives with maximum 10D+2P. Storage Capacity of 220TiB Usable RAID Capacity to be provided using NVMe FIPS Encrypted SSD without inclustion of any RAID Overhead, Storage System Overhead, Formatting Overhead or any other overheads. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controllers.	1024GB Cache to be considered.No Change for other aspects.

20	1	1	Appendix 2 - Bill of Material License for FC, iSCSI, CIFS, NFS, NVMe & NVMe/FC protocol included	License for FC, iSCSI, NVMe & NVMe/FC protocol to be included CIFS, NFS to be removed. Both Block and File has different way of functioning withon Storage and hence it should be kept separate. Therefore request to keep only Block Propotol support.	License for FC, iSCSI, NVMe & NVMe/FC protocol to be included	Rejected
21	1	1	Appendix 2 - Bill of Material 3 Years Warranty with 24x7 & 4 hrs CTR Support	4 Hour CTR is the not supported and hence request to change it to 6 Hrs CTR.	3 Years Warranty with 24x7 & 6 hrs CTR Support	Good to have 4 hours. We are OK with 6 hours CTR but preference will be given to 4 hrs CTR.
22	1	1	Appendix 2 - Bill of Material NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Most of the Storages Vendor offers 512GB of Cache Memory per controller (since Memory modules are availbale in 16/32/64 DIMM sizes and hence request to change it to 1TB Cache Memory across controllers in HA with ACTIVE ACTIVE Controllers. Please clarify whether the 110TB usable capacity ask is with which RAID Level (Suggested is Dual Disk Failure Protection RAID level - RAID 6 or equivalent as minimum) The Usbale Capacity of 110 should be in TiB and not in TB.	NVMe Flash Array Configured with two controllers in HA and shall be scalable to Four Controllers without using use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. All the hardware and software required to achieve Four Controller Scalability should be included from Day 1 except the Future 2 Controllers. All the LUNs should be able to see all the FOUR Controllers and should not be restricted to maximum 2 Controllers when upgraded to FOUR Controller Architecture. All the FOUR Controllers shall be true symmetric 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 etc. 1TB Cache across controllers - Total Usable - 110TB with all NVMe FIPS Encrypted SSD Drives. Storage Capacity should be RAID 6 or equivalent protecting Dual Disk Failure. Size of RAIDset should not be more that 12 Disk Drives with maximum 10D+2P. Storage Capacity of 110TiB Usable RAID Capacity to be provided using NVMe FIPS Encrypted SSD without inclustion of any RAID Overhead, Storage System Overhead, Formatting Overhead or any other overheads. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controllers.	1024GB Cache to be considered.No Change for other aspects.
23	1	1	Appendix 2 - Bill of Material LC to LC fibre optic patch cable for SAN and data networks	Please Specify whether the Cable Length should be 5M or 15M		15M
24		Page No. 10	3.0. Scope of Work	L1 Bidder must arrange for a dedicated Project Manager and Technical Manager who will remain available onsite in person as SPOC during the full project implementation (From Delivery till successful Application deployment). Back to back arrangement with OEM should be made by L1 Bidder and same should be submitted to BFSL.	Request you to clarify (Installation SOW- L1 Bidder or OEM?)	Installation/Migration Support/Operations Support

25				OEM should include Services like periodic health check, Performance Analysis Service, PT service, Rebalance Service etc to ensure that the proposed solution is working with optimal performance and is best utilized asper BFSLs requirements and industry best practices.	Need more clarity.	Limited to services like periodic health check and Pefromance Analyais Service and hardwrae check.
26		Page No. 33	Data Migration	The selected Bidder will assist the company in migration exercise without any cost to the company.	Please share existing infra & data size and type details.	Refer Sr no.1 for size.
27		Page No. 9	2.2 Data Integration	Prior to Installation & Commissioning, L1 Bidder SPOC's need to prepare and publish the complete project plan (after required confirmation & sign-off of the deployment & configuration from BFSL) and coordinate accordingly with various stakeholders for successful completion of the project which will include migration of Infra and data of the existing application onto the new setup.		Refer Sr no.1 for size.
28		Page No. 10	3.0 Scope of Work, Point No. 2	L1 Bidder should be responsible for successful End-to-End Implementation and migration of Application from shared storage hosted at Public Datacenter to the new commissioned Storage		Refer Sr no.1 for size.
29		Page No. 11	3.0 Scope of Work: Point No. 12	L1 bidder should ensure the presence of OEM engineer along with their in-house engineer.		NO Changes in clause
30		Page No. 12	3.0 Scope of Work: Point No. 20	Performance Requirements : The Bidder will be responsible for : Infrastructure Performance Monitoring Preventive Maintenance BAU Operations- Storage Administration.	Is inhouse Engineer required for Storage administration? if yes then need more clarification on support term & condition (SLA and SOW	No
31					Do we need to consider RACKs for both`` locations?.	No
32		Page No. 12	3.0 Scope of work: Point No. 21	Scalability Requirements : a) The Architecture proposed should be Horizontal and Vertical Scalable b) To be scalable as per BFSL's future requirement	Request you to clarify on this (How much scalable size is needed in the future?)	There should be no technical limitated on any horizontal and vertical scalability. Any augmentation of space or controller should be seamless and should be able to leaverage all components effectively.
33		Appendix 02- (Bill of Material)	Stoage Box (DC and DR)	8 x 32 Gbps FC Ports, 8 x 10 Gbps IP Ports	Request you to clarify on 8 x 10Gbps Port (SFP+ or Copper), Do you have TOR & Management switches in both location?	8 x 10Gbps Port SFP +. Suitable SFP module to plug in FC swicth needs to be provided by VENDOR @ DC and DR.
34		Page No 3	Point 4	The Bidder (including its OEM, if any) must comply with the requirements contained in O.M. No. 6/18/2019-PPD,dated 23.07.2020 order (Public Procurement No. 1), order (Public Procurement No. 2) dated 23.07.2020 and order (Public Procurement No. 3) dated 24.07.2020	Please assist can Bidder and OEM Submit the GST Certificate for the said Clause	GST certficate cannot be accepted for this clause. Kindly provide us with Incorporation certificate or relevant document specifying the origin of both entity.
35			Delivery Term		Please specify the delivery timeline.	6-8 Weeks
36	6	1.7	EMD & Tender fee	Bid document cost - INR 10,000/- Bid Security (EMD) - INR 100,000/-	We registered under Single Point Registration Scheme of NSIC are eligible to get the benefits under "Public Procurement Policy for Micro & Small Enterprises (MSEs) Order 2012" as notified by the Government of India, Ministry of Micro Small & Medium Enterprises, New Delhi vide Gazette Notification dated 23.03.2012. as per above clause we are exempted from EMD & Tender Fee. so request to you kindly allow MSME certificate.	Exemption on Tender Fee and EMD for MSME vendor on submission of certificate. But PBG will be applicable if shortlisted.

37	9	2.2	The selected Bidder will assist the company in migration exercise without any cost to the company	Required clerfication for existing data that need to migrate	Request you to kindly provide details of existing storage (Model no., capacity) ,Types of data , list of application and workload that need to migrate	There should be no technical limitated on any horizontal and vertical scalability. Any augmentation of space or controller should be seamless and should be able to leaverage all components effectively.
38	10	3	L1 Bidder should be responsible for successful End-to-End Implementation and migration of Application from shared storage hosted at Public Datacenter to the new commissioned Storage	Required clerfication for existing Application that need to migrate	Request you to kindly provide the list of application where the storage is connected	Application Migration not required. Existing Infra is shared with the hosting partner
39	12	17	RCA for any issues should be provided by L1 Bidder within 24 hours. The penalty of Rs. 20000 per hr per instance in a month will be applicable on delay beyond 24 hrs unless approved by BFSL in advance for specific cases.		We reqest you to remove this clause as RCA depends on multiple factor like application , network , security hence we reqest you to remove this clause	RCA for issues related to storage should be provided by L1 Bidder within 24 hours. The penalty of Rs. 20000 per hr per instance in a month will be applicable on delay beyond 24 hrs unless approved by BFSL in advance for specific cases.
40	10	3.0/2	L1 Bidder should be responsible for successful End-to-End Implementation and migration of Application from shared storage hosted at Public Datacenter to the new commissioned Storage	Required clerification for no. of host connected to existing storage and new storage	Request you yo kindly provide no. of host connected to storage	Details will be shared with L1 Bidder.
41	1	1	NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Required clerfication for HDD retunable	Request you to kindly clerify the fail HDD you submit for replacement or keep as it is as non retunable	Faulty HDD will be non-returnable
42	1	2	1.9TB self-encrypting (SED) with AES-256 encryption 3.8TB self-encrypting (SED) with AES-256 encryption 7.6TB self-encrypting (SED) with AES-256 encryption 15.3TB self-encrypting (SED) with AES-256 encryption	Required clerfication for HDD retunable	Request you to kindly clerify the fail HDD you submit for replacement or keep as it is as non retunable	This will be rate card for future expansion
43	1	1	NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Required clerification on storage capacity	Request you to Kindly clerify the storage usable capacity needed is actual usable capacity or effective capacity consider deduplication , comperasion	Usable Capacity
44	1	1	NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Required location of DC and DR with bandwidth allocation for storage	Request you to Kindly provide location of DC and DR & with bandwidth allocation of DC and DR for storage with daily change rate	Bandwidth allocation not sized at moment and can be augmented upon implementation on recommendation
45	1	1	NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Required clerfication on iops	Reqest you to kindly provide total no. of IOPS required and total no. of disk reqirement (tentativley)	Refer Addendum

46	1	1	NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Required clerfication on scalablity of storage	Request you to kindly provide scalablity you need in this storage	Refer Addendum
47			NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives	What is the current workload of BOBF in Block and File. Application Landscape for the individual workload is (Mandatory).	Application & Workload profile is very important to size the storage and reduce the risk of undersizing or over sizing	130TB Block & 40TB File
48				What %age of workload comprises of File or NAS and what is the throughput BOBF is looking for and @ what %age of sequential Read & write for File use	File throughput performance figures are required in GB/s or Gbps	Approx 60% Block & 40% File
49				What is the Block Performance in IOPs and at what Block size of I/O ? What is the Read/Write ratio ? Any specific parameter for Controller processor utilization to achieve the required IOPs ? What is the latency expected ? Can we have some figures on the No. of Processor Cores required per controller. Industry standard has become 32 Cores per controller minimum for any Enterprise Storage requirement.	Kindly Specify the IOPs required for Block workload and Throughput required for File Workload Block performance @ what %age of controller utilization No. of Processor Cores are required per controller	Refer Addendum
50				What is controller scalability required in future for horizontal and Vertical scalability as asked in the RFP. Do you need the controller scalability in Scale-Out or Scale-Up fashion	No. of Controller Scalability for future and in what form (Scale-Out or Scale-Up)	Scale-Out or Scale-Up Both Features Require.
51				Is there any specific Hard Drive capacity size considered for the required usable capacity of 220TB and 120TB ? NVMe as a technology take minimum RAID rebuilding time hence customer prefers to have a higher capacity drives nowadays. What is the NVMe Drive scalability expected from each Array ?	Kindly specify the NVMe Hard Drive capacity required for sizing the usable capacity and @ what RAID level. Do also mention how many Hot Spare Drives are required per 10/20/30 Drives	Refer Addendum
52				Cache asked is 1.2TB per Array which is not a universal cache size. The universal Cache sizes are like 256GB, 512GB, 768GB, 1024GB, 2048GB. Only NetApp comes with 1280GB of Cache in HA pair of AFF800 so should we assume that this is inclined to a particular model & Brand.	Kindly chage the Cache size to minimum 512GB per controller which will increase the bid participation	1024GB Cache to be considered
53			1.9TB/3.84TB/7.68TB/15.3TB self-encrypting (SED) with AES-256 encryption	Nowadays storage technology has evolved post NVMe adoption with Encryption as a dedicated ASIC hardware unit integrated in the controllers which provides multiple level of encryption security not only on Hard Disk level but also controller level, SED based encryption is limited to Hard Disk only. SED based Encryption does not give flexibility to have not encrypted file data in the same controller.	Kindly remove the self-encrypting(SED) with AES-256 encryption and put "Encryption with Data At Rest" being a common terminology for Encryption and this will also help maximum OEM's to qualify	Good to have.
54			Premium Bundle License Included	Kindly ellaborate this Premium Bundle and the Software components required by BOBF team to operate the Storage	Kindly specify the details of Premium bundle license	All Licenses required for storage to storage replication

55			License for FC, iSCSI, CIFS, NFS, NVMe & NVMe/FC protocol included	This point highlights that BOBF is looking for a Unified Storage Box with all the SAN/NAS access protocols There are always a performance bottleneck on the Controller Cores and Cache when the Block & File workload are mixed impacting the Business Critical workload performance bottleneck and Queing of Transactions in the DB layer creating latency	Requesting BOBF to segregate the Block & File workload to different controllers for better and stable performance	No Change
56			16/32/64 Gbps SAN Switches (Brocade/Cisco)	64G Switch is comparitively costlier being the latest in SAN Fabric offering and does not bring in the regular form of TCO and Cost economy with higher density of Ports. Most of the Storage Vendor is still offering 32G Frontend I/O ports in their controllers.	Requesting you to stick on to 32G SAN Fabric Switches over a choice of 64G Is BOBF is looking for the modular form factor based SAN Switch or Blade Based Director Class Switch ?	Accepted
57	28	8	Payment Terms	90% Payment of the Hardware cost on successful Supply, Installation, Commissioning and Configuration,Migration, and deployment of the application on the procured hardware.10% of the Hardware Cost on submission of an equivalent amount of Performance BFSL Guarantee.	Requesting you for changing the payment terms to 50 % against Delivery, 40% against the Installation, Commissioning and Configuration,Migration, and deployment of the application on the procured hardware. And 10% against submission of PBG.	Okay
58	16	5.4	Bid Security and Performance Guarantee	Bidders are required to submit an Bid Security/ Earnest Money Deposit (EMD) for Rupees Rs100,000/- by way of Bank Guarantee	Request you for the exemption of EMD amount as some organisatiions give exemption in EMD amount for MSME companies	Exemption on Tender Fee and EMD for MSME vendor on submission of certificate. But PBG will be applicable if shortlisted.
59			NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives	What is the current workload of BOBF in Block and File. Application Landscape for the individual workload is (Mandatory).	Application & Workload profile is very important to size the storage and reduce the risk of undersizing or over sizing	130TB Block & 40TB File
60				What %age of workload comprises of File or NAS and what is the throughput BOBF is looking for and @ what %age of sequential Read & write for File use	File throughput performance figures are required in GB/s or Gbps	Approx 60% Block & 40% File
61				What is the Block Performance in IOPs and at what Block size of I/O ? What is the Read/Write ratio ? Any specific parameter for Controller processor utilization to achieve the required IOPs ? What is the latency expected ? Can we have some figures on the No. of Processor Cores required per controller. Industry standard has become 32 Cores per controller minimum for any Enterprise Storage requirement.	Kindly Specify the IOPs required for Block workload and Throughput required for File Workload Block performance @ what %age of controller utilization No. of Processor Cores are required per controller	Refer Addendum
62				What is controller scalability required in future for horizontal and Vertical scalability as asked in the RFP. Do you need the controller scalability in Scale-Out or Scale-Up fashion	No. of Controller Scalability for future and in what form (Scale-Out or Scale-Up)	Scale-Out or Scale-Up Both Features Require.
63				Is there any specific Hard Drive capacity size considered for the required usable capacity of 220TB and 120TB ? NVMe as a technology take minimum RAID rebuilding time hence customer prefers to have a higher capacity drives nowadays. What is the NVMe Drive scalability expected from each Array ?	Kindly specify the NVMe Hard Drive capacity required for sizing the usable capacity and @ what RAID level. Do also mention how many Hot Spare Drives are required per 10/20/30 Drives	Refer Addendum

64				Cache asked is 1.2TB per Array which is not a universal cache size. The universal Cache sizes are like 256GB, 512GB, 768GB, 1024GB, 2048GB. Only NetApp comes with 1280GB of Cache in HA pair of AFF800 so should we assume that this is inclined to a particular model & Brand.	Kindly chage the Cache size to minimum 512GB per controller which will increase the bid participation	1024GB Cache to be considered
65			1.9TB/3.84TB/7.68TB/15.3TB self-encrypting (SED) with AES-256 encryption	Nowadays storage technology has evolved post NVMe adoption with Encryption as a dedicated ASIC hardware unit integrated in the controllers which provides multiple level of encryption security not only on Hard Disk level but also controller level, SED based encryption is limited to Hard Disk only. SED based Encryption does not give flexibility to have not encrypted file data in the same controller.	Kindly remove the self-encrypting(SED) with AES-256 encryption and put "Encryption with Data At Rest" being a common terminology for Encryption and this will also help maximum OEM's to qualify	Good to Have
66			Premium Bundle License Included	Kindly ellaborate this Premium Bundle and the Software components required by BOBF team to operate the Storage	Kindly specify the details of Premium bundle license	All Licenses required for storage to storage replication
67			License for FC, iSCSI, CIFS, NFS, NVMe & NVMe/FC protocol included	This point highlights that BOBF is looking for a Unified Storage Box with all the SAN/NAS access protocols There are always a performance bottleneck on the Controller Cores and Cache when the Block & File workload are mixed impacting the Business Critical workload performance bottleneck and Queing of Transactions in the DB layer creating latency	Requesting BOBF to segregate the Block & File workload to different controllers for better and stable performance	No Change
68			16/32/64 Gbps SAN Switches (Brocade/Cisco)	64G Switch is comparitively costlier being the latest in SAN Fabric offering and does not bring in the regular form of TCO and Cost economy with higher density of Ports. Most of the Storage Vendor is still offering 32G Frontend I/O ports in their controllers.	Requesting you to stick on to 32G SAN Fabric Switches over a choice of 64G Is BOBF is looking for the modular form factor based SAN Switch or Blade Based Director Class Switch ?	Accepted
69			L1 Bidder must ensure a flawless migration (Infra or Data) from existing setup to New setup as required by BFSL at both PR & DR without any additional cost at both PR and DR sites. The migration plan for both PR and DR to be shared with BFSL for necessary approval.	For flawless migration, exisitng installed infra details are required, no fo Physical Servers, No of Sotrage connected to server, Virtualization Platform, any Database server connected to Stroage, NAS workload and how NAS is getting access though different applications, etc..		Details will be shared with L1 Bidder.
70	14	4.00	Service Levels & Penalty - Please refer Addendum	Kindly share the details.		Refer Addendum
71	28	8.00	90% Payment of the Hardware cost on successful Supply, Installation, Commissioning and Configuration, Migration, and deployment of the application on the procured hardware. 10% of the Hardware Cost on submission of an equivalent amount of Performance BFSL Guarantee. Annual Maintenance Cost after completion of Warranty will be factored quarterly during the entire AMC contract period in arrears	Kindly refer the request for change.	Since the Bidder will have to pay the OEM upfront for the product & warranty, we request BOB Financial to modify the payment terms as under:- 90% Payment of Hardware Cost on delivery. 10% Payment of Hardware Cost on implementation & PBG. AMC payment annually in advance.	BFSL is OPEN for discussion on Payment terms with shorlisted bidder.

72	28	8.00	Payment of the Hardware cost on successful Supply, Installation, Commissioning and Configuration, Migration, and deployment of the application on the procured hardware.	Kindly clarify if the commissioning is delayed due to any reasons dependant on BOB Financial, will the payment be released by BOB Financial to the bidder.		To be discussed with L1 Bidder
73	31	9.5	Company shall have the option to terminate any subsequent agreement and / or any particular order, in whole or in part by giving Vendor at least 90 days prior notice in writing.	Kindly refer the request for change.	As the bidder would have taken non-cancellable back-lining of support from OEM for the entire contract duration, we request you to remove this termination for convenience.	Okay
74	31	9.4	the Company would like to have options to revisit the arrangements and terms of contract as well as to re-price the same (rates similar or less than existing arrangement) after the contract expiry, if necessary.	Kindly refer the request for change.	While the prices will be locked for the initial PO, since the prices are dependent on Duties (including Custom Duty), Taxes, Levies, USD-INR exchange rate, OEM List Price, OEM Discounting etc. we request AIIA to delete this clause or modify that the prices for subsequent orders will be mutually agreed.	Okay
75	38	9.23	I. The proposed rate of penalty would be 0.5% of the entire project cost/TCO per week of delay or non-compliance. Company at its discretion may apply this rule to any major non-delivery, non-adherence, non-conformity, non-submission of agreed or mandatory documents as part of the Project. V.The maximum amount that may be levied by way of penalty pursuant to clause above shall not exceed 10% of the Total Contract value.	Kindly refer the request for change.	We request BOB Financial to restrict / cap the overall LD & Penalty to a maximum of 5% of the TCO.	Accepted
76	22	6.80	INTEGRITY PACT The BIDDER undertakes that it has not offered/is not offering similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU or any other Bank and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU or a Bank at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the COMPANY, if the contract has already been concluded.	Kindly refer the request for change.	We agree to execute the Integrity Pact, subject to deletion of the Fall Clause. The prices given are based on several factors, including OEM discounts, dollar fluctuation, volume and location of order and other contractual risks. Further, the CVC has by its circular, made it clear that Fall Clause is not an integral part of the Integrity Pact.	Please submit the circular , or else the clause will be aaplicable.

77	29	9.20	Indemnity – The Selected Vendor shall indemnify the company, and shall always keep indemnified and hold the Company, its employees, personnel, officers, directors, (hereinafter collectively referred to as "Personnel") harmless from and against any and all losses, liabilities, claims, actions, costs and expenses (including attorneys' fees) relating to, resulting directly or indirectly from or in any way arising out of any claim, suit or proceeding brought against the Company as a result of: • Company's authorized / bona fide use of the Deliverables and /or the Services provided by selected Vendor under this RFP; and/or • any act of commission or omission, fraud, negligence, breach on the part the selected Vendor and/or its employees, agents, sub-contractors in performance of the obligations under this RFP; and/or any act of omission of statutory requirement and/or • claims made by employees or subcontractors or subcontractors' employees, who are deployed by the selected Vendor, against the company; and/or • claims arising out of employment, non-payment of remuneration and non-provision of statutory benefits by the selected Vendor to its employees, its agents, contractors and sub-contractors • breach of any of the term of this RFP or breach of any representation or false representation or inaccurate statement or assurance or covenant or warranty of the selected Vendor under this RFP/subsequent agreement; and/or • any or all Deliverables or Services infringing any patent, trademarks, copyrights or such other Intellectual Property Rights; and/or • breach of confidentiality	Kindly refer the request for change.	We request that Indemnity provision be restricted to indemnity for third party claims due to violation of IPR, breach of confidential information and in case of breach of tax laws or anti-corruption laws. Indemnity is an additional remedy under contract. For breach of contract, client will always have remedy under contract.	Faulty HDD will be non-returnable
78	31	9.40	Extension of Contract Post Expiry The Company desires to appoint the vendor for a total period specified in the RFP, considering the effort and investments required in the arrangement. However, understanding the complexities of the entire arrangement, Company would like to safe guard the interests of all the entities involved in the arrangement. Therefore, the Company would like to have options to revisit the arrangements and terms of contract as well as to re-price the same (rates similar or less than existing arrangement) after the contract expiry, if necessary. • The Company expects the benefits from any unanticipated decrease in technology infrastructure costs, over the term of the contract due to reduction of prices, efficient use of IT infrastructure/reduction of statutory charges, etc. and operations management methods that yield more efficient operations, to be passed on through re-negotiation. No conflict between the Selected Bidder and the Company will cause cessation of services.	Kindly refer the request for change.	We request changes in this clause. Bidder cannot agree to any downward revision of prices. Further, any termination for convenience will incur termination fee and costs incurred by Bidder, which will have to be mitigated by the client.	Okay

79	31	9.50	Termination of Contract – Page 31 I.Company shall have the option to terminate any subsequent agreement and / or any particular order, in whole or in part by giving Vendor at least 90 days prior notice in writing. It is clarified that the Vendor shall not terminate the subsequent Agreement for convenience.	Kindly refer the request for change.	We request deleting this clause. No termination for convenience shall be allowed, apart from paying termination fees and costs incurred by the Bidder which cannot be mitigated otherwise.	We are asking vendor to not terminate the contarct for his convenience. We cannot delete the clause
80	39	9.24	Set Off – Without prejudice to other rights and remedies available to the company it shall be entitled to earmark , set-off or adjust any amounts due to the company, under any clause of the RFP, from the selected bidder Provider against payments due and payable by the company to the selected bidder/Service Provider for the services rendered. The provisions of this Clause shall override all other clauses and shall survive the termination of this Agreement.	Kindly refer the request for change.	We request changes and confirmation that only applicable LD/penalty may be set off from the Invoice of the successful Bidder.	Okay
81			LIMITATION OF LIABILITY	Kindly refer the request for change.	We request that liability of the Bidder is capped to the annual contract value under this RFP. Liability of Bidder is presently uncapped. Further, please confirm that neither Party shall be liable for any indirect, consequential and exemplary losses and damages, including for loss of profit, damages for loss of data.	We are OK with capping, but the value will be capped at Total contract value of 5 years.
82		Bill of Material	Appendix 07- Excel	Capacity of the Box in DC & DR Clarification?	Request BOB Financials to confirm 220 TB as DC Box size	220TB at DC BOX.
83		Annexure 1 Eligibility	Net Profit (after all taxes etc) of the bidder	Request change in Net Profit Clause	Request Positive NetProfit in any 2 of the last 3 financial Year	Cannot Change Eligibility clause
84			L1 Bidder should be responsible for successful End-to-End Implementation and migration of Application from shared storage hosted at Public Datacenter to the new commissioned Storage	Request clarification : on Application migration - We believe migration is for data residing on existing storage to New Proposed Box	L1 Bidder should be responsible for successful End-to-End existing Storage Public Datacenter to the new commissioned Storage	To be discussed
85	1	RFP	RFP for Selection of bidder for Delivery, Installation, Commissioning ,Maintenance & Support	Does Day 2 Day Operations come under Supplied Scope or We have to supply , install , Commission and provide Maitenance via OEM Support ? Operations will be done via your existing partner / vendor ?		Day 2 Day Operations not to be factored in the capex cost
86	28	Commercial Bid Evaluation	The key considerations of the TCO would be the total payouts for entire project through the contract period of 3 years.	Request BoB Financial to clarify , the TCO is for 5 Years or 3 Years ?	Request clarity ?	5 Years
87			MAF Format for OEM 's	Request MAF FORMAT from Bank of Baroda Financials or we can submit OEM std MAF formats ?		We don't have a format, we want bidders to mention the releavnt OEM details and get there signature to justify the same.
88			Annexure 2 Bill of Material	Request BOB Financials to clarifty 220 TB storage required in DC & 110 TB as per commercial format , are Pre Dudplication & Compression ?		Yes
89			Annexure 2 Bill of Material	Storage box : Quantity 1 each at Primary & DR (Total 2 QTY) Storage box : Quantity 1 each at Primary & DR (Total 2 QTY) SAN Switches: Quantity 4 each at Primary & DR (Total 8 QTY)	Request clarification from Bank of Baroda financials ?	Storage box : Quantity 1 each at Primary & DR (Total 2 QTY) SAN Switches: Quantity 2 at Primary & 2 at DR (Total 4 QTY)
90			General Query	No Mention of Implementation scope & Migration is mentioned in the RFP	Need clarification if basic installation and configuration needs to be included along with Migration(if not greenfield).	Refer Addendum
91			Annexure 2 Bill of Material	ddditional DAE: Internconnect/License/Controlle	Request clarification regarding controllers in DAE	Refer Addendum

92			Annexure 2 Bill of Material	Request Revised Commercial Format ? Stating Product Cost (including 3 year warranty) One time implementation Training Migration Cost AMC Cost 4th & 5th year Post warrant & For SAN SWITCH Product Cost (including 3 year warranty) One time implementation AMC Cost 4th & 5th year Post warrant	Request BOB Financials to issue a revised commercial Format	No Change
93			Warranty	Please be informed that OEM warranty will start from the date of delivery to BFSL datacenter .. FYI Point		Accepted
94	11	11	L1 Bidder must ensure a flawless migration (Infra or Data) from existing setup to New setup as required by BFSL at both PR & DR without any additional cost at both PR and DR sites. The migration plan for both PR and DR to be shared with BFSL for necessary approval.	For Migration of Infra OR Data - Complete Details will be required What all equipments are required to be migrated. Details of existing Storage OEM and Model Host wise details of OS, HBA, Data Type and Data size Total Datasize for Migration at both DC and DR		Refer Sr no.1 for size. Vendor expected to facilitate in migraion only from storage perspective.
95	12	21	Scalability Requirements : a) The Architecture proposed should be Horizontal and Vertical Scalable b) To be scalable as per BFSL's future requirement	For Scalability of Storage certain parameters are required for Horizontal and Vertical Scalability. Like for Horizontal Scalability the Storage solution should be able to have scalability from 2 Controller to 4 controllers just by adding additional controllers and no other equipments like external LAN/Infiniband switches. It should also take care of the existing LUN's to be exposed to all the Four controllers when upgraded from 2 to 4 contollers. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controller.	The proposed storage array should be NVMe based scale-up and scale-out Active - Active architecture. All the hardware and software required to achieve Four Controller Scalability should be included from Day 1 except the Future 2 Controllers. Vendor shall ensure that all controllers, with and without scalability, shall be connected to a common back-plane and shall not use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. When Storage is upgraded from 2 controllers to 4 controllers; all the existing LUNs present should be exposed to all the Four Controllers Symmetrically to have benefit of Four Controllers providing Performance and Availability to all the LUNs and not restricted to only 2 controllers. All the LUNs should be able to see all the FOUR Controllers when upgraded to FOUR Controller Architecture and should not be restricted to Maximum 2 Controllers. All the FOUR Controllers shall be true symmetric 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 etc. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controllers.	There should be no technical limitated on any horizontal and vertical scalability. Any augmentation of space or controller should be seamless and should be able to leaverage all components effectively.

96	1	1	Appendix 2 - Bill of Material NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 220TB with all NVMe Drives	Most of the Storages Vendor offers 512GB of Cache Memory per controller (since Memory modules are availbale in 16/32/64 DIMM sizes and hence request to change it to 1TB Cache Memory across controllers in HA with ACTIVE ACTIVE Controllers. Please clarify whether the 220TB usable capacity ask is with which RAID Level (Suggested is Dual Disk Failure Protection RAID level - RAID 6 or equivalent as minimum) The Usbale Capacity of 220 should be in TiB and not TB.	NVMe Flash Array Configured with two controllers in Symmetric Active- Active HA and shall be scalable to Four Controllers in Symmetric Active- Active HA without using use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. All the hardware and software required to achieve Four Controller Scalability should be included from Day 1 except the Future 2 Controllers. All the LUNs should be able to see all the FOUR Controllers and should not be restricted to maximum 2 Controllers when upgraded to FOUR Controller Architecture. All the FOUR Controllers shall be true symmetric 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 etc. 1TB Cache across controllers - Total Usable - 220TB with all NVMe FIPS Encrypted SSD Drives. Storage Capacity should be RAID 6 or equivalent protecting Dual Disk Failure. Size of RAIDset should not be more that 12 Disk Drives with maximum 10D+2P. Storage Capacity of 220TiB Usable RAID Capacity to be provided using NVMe FIPS Encrypted SSD without inclustion of any RAID Overhead, Storage System Overhead, Formatting Overhead or any other overheads. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controllers.	1024GB Cache to be considered. No others aspect accepted.
97	1	1	Appendix 2 - Bill of Material License for FC, iSCSI, CIFS, NFS, NVMe & NVMe/FC protocol included	License for FC, iSCSI, NVMe & NVMe/FC protocol to be included CIFS, NFS to be removed. Both Block and File has different way of functioning withon Storage and hence it should be kept separate. Therefore request to keep only Block Propotol support.	License for FC, iSCSI, NVMe & NVMe/FC protocol to be included	Rejected
98	1	1	Appendix 2 - Bill of Material 3 Years Warranty with 24x7 & 4 hrs CTR Support	4 Hour CTR is the not supported and hence request to change it to 6 Hrs CTR.	3 Years Warranty with 24x7 & 6 hrs CTR Support	Already answered above

99	1	1	Appendix 2 - Bill of Material NVMe Flash Array Configured with two controllers in HA 1.2TB Cache across controllers - Total Usable - 110TB with all NVMe Drives	Most of the Storages Vendor offers 512GB of Cache Memory per controller (since Memory modules are availbale in 16/32/64 DIMM sizes and hence request to change it to 1TB Cache Memory across controllers in HA with ACTIVE ACTIVE Controllers. Please clarify whether the 110TB usable capacity ask is with which RAID Level (Suggested is Dual Disk Failure Protection RAID level - RAID 6 or equivalent as minimum) The Usbale Capacity of 110 should be in TiB and not in TB.	NVMe Flash Array Configured with two controllers in HA and shall be scalable to Four Controllers without using use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. All the hardware and software required to achieve Four Controller Scalability should be included from Day 1 except the Future 2 Controllers. All the LUNs should be able to see all the FOUR Controllers and should not be restricted to maximum 2 Controllers when upgraded to FOUR Controller Architecture. All the FOUR Controllers shall be true symmetric 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 etc. 1TB Cache across controllers - Total Usable - 110TB with all NVMe FIPS Encrypted SSD Drives. Storage Capacity should be RAID 6 or equivalent protecting Dual Disk Failure. Size of RAIDset should not be more that 12 Disk Drives with maximum 10D+2P. Storage Capacity of 110TiB Usable RAID Capacity to be provided using NVMe FIPS Encrypted SSD without inclustion of any RAID Overhead, Storage System Overhead, Formatting Overhead or any other overheads. The proposed storage must support at least 100 NVMe FIPS Encrypted SSD drives with 2 Controllers and shall be able to scale to 200 NVMe FIPS Encrypted SSD drives within the same storage array after upgrading to Four Controllers.	1024GB Cache to be considered. No others aspect accepted.
100	1	1	Appendix 2 - Bill of Material LC to LC fibre optic patch cable for SAN and data networks	Please Specify whether the Cable Length should be 5M or 15M		15M
101		2	1. Storage should be configured with minimum 220TB usable capacity at PR and 100TB usable capacity at DR in RAID 1 (excluding hot-spare) for PR and 100TB usable capacity in RAID 1 (excluding hotspare) for DR. Proposed capacity should be configured without considering any storage optimisation or data optimisation features like deduplication, compression, compaction etc. 2. Performance Criteria may be equal to or greater as below mentioned during a Read Write ratio of 50:50 3. On random read of a 4K Block Size, latency limit to stay under 1ms until 1 Million IOPS 4. On random write of a 4K Block Size, latency limit to stay under 2ms until 400K IOPS 5. Sequential Read: Up to 18.9 GB/s IOPS at 1.7ms latency 6. Sequential Write: Up to 80K IOPS or 5GB/s at 1ms 7. Disks should be configured through both horizontally and vertically for maximum throughput.	RAID 6 is the Best RIAD Level for Critical Storage as it provides Better Availability - any 2 disk failure simultaneously within a given raid group can be tolerated without data loss unlike RAID1. This is the reason we are only supporting RAID 6 for Critical NVMe Storage where Performance along with Availbility is MUST. Capacity for PR and DR not clear.	1. Storage should be configured with minimum 220TB usable capacity at PR and 100TB usable capacity at DR in RAID 1/RAID6 (excluding hot-spare) for PR and 100TB usable capacity in RAID 1/RAID6 (excluding hotspare) for DR. Proposed capacity should be configured without considering any storage optimisation or data optimisation features like deduplication, compression, compaction etc. 2. Performance Criteria may be equal to or greater as below mentioned during a Read Write ratio of 50:50 3. On random read of a 4K Block Size, latency limit to stay under 1ms until 1 Million IOPS 4. On random write of a 4K Block Size, latency limit to stay under 2ms until 400K IOPS 5. Sequential Read: Up to 18.9 GB/s IOPS at 1.7ms latency 6. Sequential Write: Up to 80K IOPS or 5GB/s at 1ms 7. Disks should be configured through both horizontally and vertically for maximum throughput.	Accepted

102		4	1. The Storage should have Dual Controller FC host-based SAN array. 2. NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity. 3. Controller should be truly active-active with loadbalancing of I/O across all controller resources. 4. Inline data compression, de-duplication, and compaction 5. Space-efficient LUN, file, and volume cloning 6. Automatic data tier'ing	Point 2 is vendor specific as for 100TB requirment asking for scale out cluster 316PB does not go well. Scalabilty of 3000X+? Instead of asking for scale-out cluster that does not provide performance of more than 2 controllers to a LUN is a bottleneck for any critical workload. Therefore, Symmetric Active active controllers should be asked that provides better performance wherein a LUN will be able to have performance of more than 2 controllers which is an important and should be present as main point replacing existing #2 with the new one. NVMe Storage is meant for high performance Block Storage and hence we dont; support file on the same, hence request to remove file requirement. In case file requirment is required then let there be an seperate additional 2 controllers for FILE requirment to ensure precious resourcesof NVMe Storage meant for Block is not consumed for File. NVMe Storage comes with NVMe SSD's and does not support HDD's and hence Data tiering is not supported and required in All Flash NVMe storage.	1. The Storage should have Dual Controller FC host-based SAN array. 2. The Storage shall be scalable to at-least Quad controllers in a true symmetrical active-active mode without changing the existing controllers. Vendor shall ensure that all controllers with and without scalability should be connected to a common back-plane and shall not use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. while scaling up the Controllers. 2. ~~NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity.~~ 3. Controller should be truly Symmetric active-active with loadbalancing of I/O across all controller resources such that all the volumes are active on all the controllers at the same time. 4. Inline data compression, de-duplication, and compaction 5. Space-efficient LUN, ~~file~~, and volume cloning 6. ~~Automatic data tier'ing~~	No Change
103		5	1. FC, iSCSI, NVMe/FC, FCoE, NFS, SMB, Amazon S3, CIFS	NVMe Storage is based on highly efficient NVMe protocol and hence it's primarily meant for Block Storage Protocol support; therefore request you to remove File, Object and FCoE support	1. FC, iSCSI, NVMe/FC, ~~FCoE, NFS, SMB, Amazon S3, CIFS~~	No Change in exsiting clause except Amazon S3.
104		6	1. The array should support a mix and match of RAID levels behind a cluster of controllers. 2. RAID controller that support RAID Level 0,1,5,10,6 or any equivalent standard data protection technique. 3. The storage array should allow online expansion of existing RAID Groups / Storage Disk Pools. 4. Implemented RAID Policy should have the capability to handle 3 disk failures concurrently. 5. Mirroring and self-encrypting SSDs that are AES-256,FIPS 140-2 compliant 6. Backup and Data protection tools which integrate well with its arrays	As highlghed above for the NVMe Storage high availaility is quite important and hence we only support RAID 6 for Critical NVMe Storage. Therefore, we only support RAID 6 on NVMe Storage. RAID 6 supports Dual Disk failure and is supported by most of the critical storage and hence is the most preferred.	1. ~~The array should support a mix and match of RAID levels behind a cluster of controllers.~~ 2. RAID controller that support RAID Level 0/1/5/10/6 or any equivalent standard data protection technique. 3. The storage array should allow online expansion of existing RAID Groups / Storage Disk Pools. 4. Implemented RAID Policy should have the capability to handle 2 / 3 disk failures concurrently. 5. Mirroring and self-encrypting SSDs that are AES-256,FIPS 140-2 compliant 6. Backup and Data protection tools which integrate well with its arrays	Accepted

105			1. Active-active and symmetric active-active (SAN-only) host connectivity. 2. Non-disruptive maintenance, upgrade, and scale-out clustering 3. Maximum resiliency for continuous data access 4. 99.999% yearly uptime.	For Critical NVMe based Storge 100% Data Availability should be asked.	1. ~~Active-active and~~ symmetric active-active (SAN-only) host connectivity. 2. Non-disruptive maintenance, upgrade, ~~and scale-out clustering~~ 3. Maximum resiliency for continuous data access 4. ~~99.999% yearly uptime.~~ 100% Data Availability Guarantee If vendors are not supporting the 100% data availability as per their web site then vendor shall quote additional Controller and 10% additional storage capacity as cold spare along with array for mitigating the failure situations.	Accepted
106		8	1. Reliability should be maintained at both Data & Infra level. 2. Data in cache should be protected against unexpected power failures for 72 hours of time. 3. Deployed Infra should have internal diagnostics for environment monitoring to ensure availability. 4. Offered Storage Array should be configured such that there is No Single Point of Failure Configuration. Ensure Uninterrupted Data Access with integrity of data to be at 100% i.e. zero data loss during Read Write even during peak load 5. Storage array no single point of failures (No SPoF) should extend to component and functional level redundancy to provide high availability features for all the components at RAID controller level, redundant power supply, and redundant cooling fans. Each controller should have dual power supplies and battery backed cache. 6. Must provide end-to-end data protection, parity checking and parity protection at sector level. It should have the capability that runs in background to proactively check every sector of every disk and correct data errors with the help of below features a. Application-consistent Snapshot copies and restore b. Integrated remote backup/disaster recovery c. Synchronous zero data loss replication	Cache Protection mechanism is designed as per bet practices of Vendor design. Some vendor preferes battery backed cache while some vendor destage it to ssd. Both provide the same functionality and hence either of them should be allowed. Scale out storage to 24 nodes does not provide any benefit since it's does not provide any performance benefit to a LUN beyond 2 controllers and hence Symmetric ACTIVE ACTIVE architecture scaling to FOUR Controller should be asked as that provides Double the Peformance to a LUN in case there is Performance crunch of any type. Therefore, Sclae out Storage to 24 Nodes should be removed.	1. Reliability should be maintained at both Data & Infra level. 2. Data in cache should be protected against unexpected power failures for 72 hours of time. 3. Deployed Infra should have internal diagnostics for environment monitoring to ensure availability. 4. Offered Storage Array should be configured such that there is No Single Point of Failure Configuration. Ensure Uninterrupted Data Access with integrity of data to be at 100% i.e. zero data loss during Read Write even during peak load 5. Storage array no single point of failures (No SPoF) should extend to component and functional level redundancy to provide high availability features for all the components at RAID controller level, redundant power supply, and redundant cooling fans. Each controller should have dual power supplies and battery backed cache or ssd destage.. 6. Must provide end-to-end data protection, parity checking and parity protection at sector level. It should have the capability that runs in background to proactively check every sector of every disk and correct data errors with the help of below features a. Application-consistent/Crash-Consistent Snapshot copies and restore b. Integrated remote backup/disaster recovery c. Synchronous zero data loss replication	Accepted

107		9	1. The array should have a minimum of 1.2TB Read/Write Cache across the Storage Array. The proposed storage should further allow extending the cache memory of controllers to maximum 4TB to accommodate future business growth. 2. The overall cache should be read and write capable. The cache management should be adaptive to the I/O workload. 3. The storage should dynamically allocate Read Cache and Write Cache from the available cache to accommodate the I/O workload and should not restrict the write cache to value less than 30% of the total cache available. The storage architecture should provide battery backup to the entire cache in case of a disaster i.e. Data in cache should be protected against unexpected power failures for 72 hours of time.	GLOBAL Cache is Efficient way of utilizing the Presious Cache Resources of Storage and hence it should be Mandatory.	1. The array should have a minimum of ~~1.2TB~~ 1.5TB Read/Write DRAM GLOBAL Cache across the Storage Array. The proposed storage should further allow extending the cache memory of ~~controllers~~ Storage Array to maximum 3TB ~~4TB~~ DRAM GLOBAL Cache to accommodate future business growth. 2. The overall cache should be read and write capable. The cache management should be adaptive to the I/O workload. 3. The storage should dynamically allocate Read Cache and Write Cache from the available cache to accommodate the I/O workload and should not restrict the write cache to value less than 30% of the total cache available. The storage architecture should provide battery backup to the entire cache in case of a disaster i.e. Data in cache should be protected against unexpected power failures for 72 hours of time.	1024GB Cache to be considered. No others aspect accepted.
108		10	1. It should be possible to achieve the desired performance even with replication (synchronous or asynchronous) enabled for at least 60% of the above capacity. Overall the proposed storage system should be scalable to reach 11.4 M IOPS, a throughput of 300 GB/s, latency of 200 microsec and storage capacity of 300 TB with the above workload characteristic without downtime or impacting the existing performance. 2. NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity 3. The compliance document should be accompanied with a letter from the OEM, confirming to this requirement. 4. Storage system should be provisioned for Scale-up /Scale-Out of the deployed Infrastructure.	In the Scale out architecture of multiple 2 Node Storage; a LUN can have maximum performance of 2 controllers only and can not be benefitted even though more than 2 controllers are present as a LUN is visible only to 2 controllers. Hence scale out storage up to 24 nodes should be removed as this is vendor specific.	~~1. It should be possible to achieve the desired performance even with replication (synchronous or asynchronous) enabled for at least 60% of the above capacity. Overall the proposed storage system should be scalable to reach 11.4 M IOPS, a throughput of 300 GB/s, latency of 200 microsec and storage capacity of 300 TB with the above workload characteristic without downtime or impacting the existing performance.~~ 2. ~~NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity~~ 3. The compliance document should be accompanied with a letter from the OEM, confirming to this requirement. 4. Storage system should be provisioned for Scale-up /Scale-Out of the deployed Infrastructure. a. Offered Storage shall be supplied with at-least Dual controllers per array in true symmetrical active-active mode with automatic failover to each other in case of failure and shall be scalable to at-least Quad controllers in a true symmetrical active-active mode without changing the existing controllers. Controllers shall be true symmetric 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 etc. b. Vendor shall ensure that all controllers with and without scalability should be connected to a common back-plane and shall not use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc."	Partially Accepted. IOPS to be considered as 1.1 Million IOPS

109		11	1. The drive type supported by the proposed array must be Flash Disks and storage to be deployed should be 32+D150TB (220TB @ DC + 100TB @ DR) of usable capacity atleast. 2. NVMe Disk Drives of size 15.6 TB to be considered. 3. NVMe protocol for PCIe SSDs should deliver the below results Max Read Performance: > 3000 MB/s Max Write Performance: > 2000 MB/s 4. NVMe SSD designed for a PCIe 3.0 interface Transfer Rate up to 7.9 Gb/s and Throughput up to 3.9 GB/s 5. Necessary license for complete drive count and capacity of the proposed array should be included. 6. The flash disks should allow creation of LUNs (with Mirrored, Self-encryption features enabled) for hosting critical data. 7. The drives should fit in racks disk enclosures.	This is not clear. Please explain 32+D150TB. Required Performance is defined and hence this specifics are not required as it looks vendor specifc supporting a single vendor.	1. The drive type supported by the proposed array must be Flash Disks and storage to be deployed should be 32+D150TB (220TB @ DC + 100TB @ DR) of usable capacity atleast. 2. NVMe Disk Drives of size 15.6 TB to be considered. 3. ~~NVMe protocol for PCIe SSDs should deliver the below results Max Read Performance: > 3000 MB/s Max Write Performance: > 2000 MB/s~~ ~~4. NVMe SSD designed for a PCIe 3.0 interface Transfer Rate up to 7.9 Gb/s and Throughput up to 3.9 GB/s~~ 5. Necessary license for complete drive count and capacity of the proposed array should be included. 6. The flash disks should allow ~~creation of LUNs (with Mirrored,~~ Self-encryption ~~features enabled)~~ for hosting critical data. 7. The drives should fit in racks disk enclosures.	1) This is typo Error - Correct clause should be (220TB @ DC + 100TB @ DR) of usable capacity atleast 2) Accepted 6) Accepted
110		13	1. Inline data compression, deduplication, compaction and self-Encryption Space-efficient LUN, file, and volume cloning Automatic data tiering 2. The storage system should support dynamic volume expansion. 3. Storage array should support multi pathing across controllers. Suitable license for connectivity should also be quoted if licensed separately to meet the above functionality. 4. The Storage array must provide capability for thin provisioning of LUNs. Vendor should provide the necessary licenses in the proposed storage.	Request to remove both File and Automatic data tiering as both are not required for High Performance NVMe storages explained in previous points.	1. Inline data compression, deduplication, compaction and self-Encryption Space-efficient LUN, ~~file~~, and volume cloning ~~Automatic data tiering~~ 2. The storage system should support dynamic volume expansion. 3. Storage array should support multi pathing across controllers. Suitable license for connectivity should also be quoted if licensed separately to meet the above functionality. 4. The Storage array must provide capability for thin provisioning of LUNs. Vendor should provide the necessary licenses in the proposed storage.	Accepted
111		15	1. System should have capability to designate global hot spares that can automatically be used to replace a failed drive anywhere in the system. 2. The solution must provide automatic monitoring of the drive health and initiate proactive copy.	Each vendor has it's own mechanism of providing Hot Spare functionality and each shold be allowed fow wider participation. In fact Distributed spare enhances array performance and helps in faster disk rebuild than the tradtional method of	1. System should have capability to designate global hot spares that can automatically be used to replace a failed drive anywhere in the system. Or Storage should support Distributed Sparing. 2. The solution must provide automatic monitoring of the drive health and initiate proactive copy.	Accepted
112		17	1. Should be firmware upgradable for functionality improvements and enhancements. Must support nondisruptive upgrade of core software, BIOS, snapshot, clone remote mirroring and management software without shutting down the storage system. All host attached servers must be fully operational during system level or maintenance upgrade procedures.	Firmware upgrade without controller reboot will provide highest avaialbility for critical applications.	1. Should be firmware upgradable for functionality improvements and enhancements. Must support nondisruptive upgrade of core software, BIOS, snapshot, clone remote mirroring and management software without shutting down the storage controller ~~system~~. All host attached servers must be fully operational during system level or maintenance upgrade procedures.	Accepted

113		22	1. Management software must include both GUI and CLI tools. 2. Management of unified storage system should be through single management tool. The GUI must be able to configure all features, monitor the status and health of the storage system. Vendor should provide storage array management software for configuration, administration and monitoring. 3. Vendor shall offer the enterprise version of the software if there are multiple versions of the software. If licensed,separately, the vendor needs to provide necessary licenses for full capacity. 4. The storage array must provide performance monitoring, reporting, and tuning (QoS). The performance monitoring should be real-time and historical providing IOPS, Response Time and utilization of individual components within the storage for the entire duration selected. 5. If licensed separately, the vendor needs to provide the necessary licenses for full capacity. 6. Performance monitoring software, with license, to monitor, report and display complete array performance metrics of data, host connection data, port status, host port usage statistics, storage controller data, physical disk data,usage, disk performance, controller performance and replication performance to be included. 7. Provision to access the Monitoring software in local windows system for easy access, vendor needs to provide the necessary licenses for full capacity and premium features	Please remove Unified as NVMe storage is not required for file data and we don't support file on High Performance NVMe Storage.	1. Management software must include both GUI and CLI tools. 2. Management of ~~unified~~ storage system should be through single management tool. The GUI must be able to configure all features, monitor the status and health of the storage system. Vendor should provide storage array management software for configuration, administration and monitoring. 3. Vendor shall offer the enterprise version of the software if there are multiple versions of the software. If licensed,separately, the vendor needs to provide necessary licenses for full capacity. 4. The storage array must provide performance monitoring, reporting, and tuning (QoS). The performance monitoring should be real-time and historical providing IOPS, Response Time and utilization of individual components within the storage for the entire duration selected. 5. If licensed separately, the vendor needs to provide the necessary licenses for full capacity. 6. Performance monitoring software, with license, to monitor, report and display complete array performance metrics of data, host connection data, port status, host port usage statistics, storage controller data, physical disk data,usage, disk performance, controller performance and replication performance to be included. 7. Provision to access the Monitoring software in local windows system for easy access, vendor needs to provide the necessary licenses for full capacity and premium features	No Change
114		2	1. Storage should be configured with minimum 220TB usable capacity at PR and 100TB usable capacity at DR in RAID 1 (excluding hot-spare) for PR and 100TB usable capacity in RAID 1 (excluding hotspare) for DR. Proposed capacity should be configured without considering any storage optimisation or data optimisation features like deduplication, compression, compaction etc. 2. Performance Criteria may be equal to or greater as below mentioned during a Read Write ratio of 50:50 3. On random read of a 4K Block Size, latency limit to stay under 1ms until 1 Million IOPS 4. On random write of a 4K Block Size, latency limit to stay under 2ms until 400K IOPS 5. Sequential Read: Up to 18.9 GB/s IOPS at 1.7ms latency 6. Sequential Write: Up to 80K IOPS or 5GB/s at 1ms 7. Disks should be configured through both horizontally and vertically for maximum throughput.	RAID 6 is the Best RIAD Level for Critical Storage as it provides Better Availability - any 2 disk failure simultaneously within a given raid group can be tolerated without data loss unlike RAID1. This is the reason we are only supporting RAID 6 for Critical NVMe Storage where Performance along with Availbility is MUST. Capacity for PR and DR not clear.	1. Storage should be configured with minimum 220TB usable capacity at PR and 100TB usable capacity at DR in RAID 1/RAID6 (excluding hot-spare) for PR and 100TB usable capacity in RAID 1/RAID6 (excluding hotspare) for DR. Proposed capacity should be configured without considering any storage optimisation or data optimisation features like deduplication, compression, compaction etc. 2. Performance Criteria may be equal to or greater as below mentioned during a Read Write ratio of 50:50 3. On random read of a 4K Block Size, latency limit to stay under 1ms until 1 Million IOPS 4. On random write of a 4K Block Size, latency limit to stay under 2ms until 400K IOPS 5. Sequential Read: Up to 18.9 GB/s IOPS at 1.7ms latency 6. Sequential Write: Up to 80K IOPS or 5GB/s at 1ms 7. Disks should be configured through both horizontally and vertically for maximum throughput.	Accepted

115		4	1. The Storage should have Dual Controller FC host-based SAN array. 2. NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity. 3. Controller should be truly active-active with loadbalancing of I/O across all controller resources. 4. Inline data compression, de-duplication, and compaction 5. Space-efficient LUN, file, and volume cloning 6. Automatic data tier'ing	Point 2 is vendor specific as for 100TB requirment asking for scale out cluster 316PB does not go well. Scalabilty of 3000X+? Instead of asking for scale-out cluster that does not provide performance of more than 2 controllers to a LUN is a bottleneck for any critical workload. Therefore, Symmetric Active active controllers should be asked that provides better performance wherein a LUN will be able to have performance of more than 2 controllers which is an important and should be present as main point replacing existing #2 with the new one. NVMe Storage is meant for high performance Block Storage and hence we dont; support file on the same, hence request to remove file requirement. In case file requirment is required then let there be an seperate additional 2 controllers for FILE requirment to ensure precious resourcesof NVMe Storage meant for Block is not consumed for File. NVMe Storage comes with NVMe SSD's and does not support HDD's and hence Data tiering is not supported and required in All Flash NVMe storage.	1. The Storage should have Dual Controller FC host-based SAN array. 2. The Storage shall be scalable to at-least Quad controllers in a true symmetrical active-active mode without changing the existing controllers. Vendor shall ensure that all controllers with and without scalability should be connected to a common back-plane and shall not use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc. while scaling up the Controllers. 2. ~~NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity.~~ 3. Controller should be truly Symmetric active-active with loadbalancing of I/O across all controller resources such that all the volumes are active on all the controllers at the same time. 4. Inline data compression, de-duplication, and compaction 5. Space-efficient LUN, ~~file~~, and volume cloning 6. ~~Automatic data tier'ing~~	No Change
116		5	1. FC, iSCSI, NVMe/FC, FCoE, NFS, SMB, Amazon S3, CIFS	NVMe Storage is based on highly efficient NVMe protocol and hence it's primarily meant for Block Storage Protocol support; therefore request you to remove File, Object and FCoE support	1. FC, iSCSI, NVMe/FC, ~~FCoE, NFS, SMB, Amazon S3, CIFS~~	No Change in exsiting clause except Amazon S3.
117		6	1. The array should support a mix and match of RAID levels behind a cluster of controllers. 2. RAID controller that support RAID Level 0,1,5,10,6 or any equivalent standard data protection technique. 3. The storage array should allow online expansion of existing RAID Groups / Storage Disk Pools. 4. Implemented RAID Policy should have the capability to handle 3 disk failures concurrently. 5. Mirroring and self-encrypting SSDs that are AES-256,FIPS 140-2 compliant 6. Backup and Data protection tools which integrate well with its arrays	As highlghed above for the NVMe Storage high availaility is quite important and hence we only support RAID 6 for Critical NVMe Storage. Therefore, we only support RAID 6 on NVMe Storage. RAID 6 supports Dual Disk failure and is supported by most of the critical storage and hence is the most preferred.	1. ~~The array should support a mix and match of RAID levels behind a cluster of controllers.~~ 2. RAID controller that support RAID Level 0/1/5/10/6 or any equivalent standard data protection technique. 3. The storage array should allow online expansion of existing RAID Groups / Storage Disk Pools. 4. Implemented RAID Policy should have the capability to handle 2 / 3 disk failures concurrently. 5. Mirroring and self-encrypting SSDs that are AES-256,FIPS 140-2 compliant 6. Backup and Data protection tools which integrate well with its arrays	Accepted

118			1. Active-active and symmetric active-active (SAN-only) host connectivity. 2. Non-disruptive maintenance, upgrade, and scale-out clustering 3. Maximum resiliency for continuous data access 4. 99.999% yearly uptime.	For Critical NVMe based Storge 100% Data Availability should be asked.	1. ~~Active-active and~~ symmetric active-active (SAN-only) host connectivity. 2. Non-disruptive maintenance, upgrade, ~~and scale-out clustering~~ 3. Maximum resiliency for continuous data access 4. ~~99.999% yearly uptime.~~ 100% Data Availability Guarantee If vendors are not supporting the 100% data availability as per their web site then vendor shall quote additional Controller and 10% additional storage capacity as cold spare along with array for mitigating the failure situations.	Accepted
119		8	1. Reliability should be maintained at both Data & Infra level. 2. Data in cache should be protected against unexpected power failures for 72 hours of time. 3. Deployed Infra should have internal diagnostics for environment monitoring to ensure availability. 4. Offered Storage Array should be configured such that there is No Single Point of Failure Configuration. Ensure Uninterrupted Data Access with integrity of data to be at 100% i.e. zero data loss during Read Write even during peak load 5. Storage array no single point of failures (No SPoF) should extend to component and functional level redundancy to provide high availability features for all the components at RAID controller level, redundant power supply, and redundant cooling fans. Each controller should have dual power supplies and battery backed cache. 6. Must provide end-to-end data protection, parity checking and parity protection at sector level. It should have the capability that runs in background to proactively check every sector of every disk and correct data errors with the help of below features a. Application-consistent Snapshot copies and restore b. Integrated remote backup/disaster recovery c. Synchronous zero data loss replication	Cache Protection mechanism is designed as per bet practices of Vendor design. Some vendor preferes battery backed cache while some vendor destage it to ssd. Both provide the same functionality and hence either of them should be allowed. Scale out storage to 24 nodes does not provide any benefit since it's does not provide any performance benefit to a LUN beyond 2 controllers and hence Symmetric ACTIVE ACTIVE architecture scaling to FOUR Controller should be asked as that provides Double the Peformance to a LUN in case there is Performance crunch of any type. Therefore, Sclae out Storage to 24 Nodes should be removed.	1. Reliability should be maintained at both Data & Infra level. 2. Data in cache should be protected against unexpected power failures for 72 hours of time. 3. Deployed Infra should have internal diagnostics for environment monitoring to ensure availability. 4. Offered Storage Array should be configured such that there is No Single Point of Failure Configuration. Ensure Uninterrupted Data Access with integrity of data to be at 100% i.e. zero data loss during Read Write even during peak load 5. Storage array no single point of failures (No SPoF) should extend to component and functional level redundancy to provide high availability features for all the components at RAID controller level, redundant power supply, and redundant cooling fans. Each controller should have dual power supplies and battery backed cache or ssd destage.. 6. Must provide end-to-end data protection, parity checking and parity protection at sector level. It should have the capability that runs in background to proactively check every sector of every disk and correct data errors with the help of below features a. Application-consistent/Crash-Consistent Snapshot copies and restore b. Integrated remote backup/disaster recovery c. Synchronous zero data loss replication	Accepted

120		9	1. The array should have a minimum of 1.2TB Read/Write Cache across the Storage Array. The proposed storage should further allow extending the cache memory of controllers to maximum 4TB to accommodate future business growth. 2. The overall cache should be read and write capable. The cache management should be adaptive to the I/O workload. 3. The storage should dynamically allocate Read Cache and Write Cache from the available cache to accommodate the I/O workload and should not restrict the write cache to value less than 30% of the total cache available. The storage architecture should provide battery backup to the entire cache in case of a disaster i.e. Data in cache should be protected against unexpected power failures for 72 hours of time.	GLOBAL Cache is Efficient way of utilizing the Presious Cache Resources of Storage and hence it should be Mandatory.	1. The array should have a minimum of ~~1.2TB~~ 1.5TB Read/Write DRAM GLOBAL Cache across the Storage Array. The proposed storage should further allow extending the cache memory of ~~controllers~~ Storage Array to maximum 3TB ~~4TB~~ DRAM GLOBAL Cache to accommodate future business growth. 2. The overall cache should be read and write capable. The cache management should be adaptive to the I/O workload. 3. The storage should dynamically allocate Read Cache and Write Cache from the available cache to accommodate the I/O workload and should not restrict the write cache to value less than 30% of the total cache available. The storage architecture should provide battery backup to the entire cache in case of a disaster i.e. Data in cache should be protected against unexpected power failures for 72 hours of time.	1024GB Cache to be considered. No others aspect accepted.
121		10	1. It should be possible to achieve the desired performance even with replication (synchronous or asynchronous) enabled for at least 60% of the above capacity. Overall the proposed storage system should be scalable to reach 11.4 M IOPS, a throughput of 300 GB/s, latency of 200 microsec and storage capacity of 300 TB with the above workload characteristic without downtime or impacting the existing performance. 2. NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity 3. The compliance document should be accompanied with a letter from the OEM, confirming to this requirement. 4. Storage system should be provisioned for Scale-up /Scale-Out of the deployed Infrastructure.	In the Scale out architecture of multiple 2 Node Storage; a LUN can have maximum performance of 2 controllers only and can not be benefitted even though more than 2 controllers are present as a LUN is visible only to 2 controllers. Hence scale out storage up to 24 nodes should be removed as this is vendor specific.	~~1. It should be possible to achieve the desired performance even with replication (synchronous or asynchronous) enabled for at least 60% of the above capacity. Overall the proposed storage system should be scalable to reach 11.4 M IOPS, a throughput of 300 GB/s, latency of 200 microsec and storage capacity of 300 TB with the above workload characteristic without downtime or impacting the existing performance.~~ 2. ~~NVMe-powered SAN scale-out cluster should support up to 24 nodes (12 HA pairs) with 2,880 drives and nearly 316PB of effective capacity~~ 3. The compliance document should be accompanied with a letter from the OEM, confirming to this requirement. 4. Storage system should be provisioned for Scale-up /Scale-Out of the deployed Infrastructure. a. Offered Storage shall be supplied with at-least Dual controllers per array in true symmetrical active-active mode with automatic failover to each other in case of failure and shall be scalable to at-least Quad controllers in a true symmetrical active-active mode without changing the existing controllers. Controllers shall be true symmetric 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 etc. b. Vendor shall ensure that all controllers with and without scalability should be connected to a common back-plane and shall not use any loosely connected architecture like through SAN Switches, Ethernet Switches, InfiniBand switches etc."	Partially Accepted. IOPS to be considered as 1.1 Million IOPS

122		11	1. The drive type supported by the proposed array must be Flash Disks and storage to be deployed should be 32+D150TB (220TB @ DC + 100TB @ DR) of usable capacity atleast. 2. NVMe Disk Drives of size 15.6 TB to be considered. 3. NVMe protocol for PCIe SSDs should deliver the below results Max Read Performance: > 3000 MB/s Max Write Performance: > 2000 MB/s 4. NVMe SSD designed for a PCIe 3.0 interface Transfer Rate up to 7.9 Gb/s and Throughput up to 3.9 GB/s 5. Necessary license for complete drive count and capacity of the proposed array should be included. 6. The flash disks should allow creation of LUNs (with Mirrored, Self-encryption features enabled) for hosting critical data. 7. The drives should fit in racks disk enclosures.	This is not clear. Please explain 32+D150TB. Required Performance is defined and hence this specifics are not required as it looks vendor specifc supporting a single vendor.	1. The drive type supported by the proposed array must be Flash Disks and storage to be deployed should be 32+D150TB (220TB @ DC + 100TB @ DR) of usable capacity atleast. 2. NVMe Disk Drives of size 15.6 TB to be considered. 3. ~~NVMe protocol for PCIe SSDs should deliver the below results Max Read Performance: > 3000 MB/s Max Write Performance: > 2000 MB/s~~ ~~4. NVMe SSD designed for a PCIe 3.0 interface Transfer Rate up to 7.9 Gb/s and Throughput up to 3.9 GB/s~~ 5. Necessary license for complete drive count and capacity of the proposed array should be included. 6. The flash disks should allow ~~creation of LUNs (with Mirrored,~~ Self-encryption ~~features enabled)~~ for hosting critical data. 7. The drives should fit in racks disk enclosures.	1) This is typo Error 2) Accepted 6) Accepted
123		13	1. Inline data compression, deduplication, compaction and self-Encryption Space-efficient LUN, file, and volume cloning Automatic data tiering 2. The storage system should support dynamic volume expansion. 3. Storage array should support multi pathing across controllers. Suitable license for connectivity should also be quoted if licensed separately to meet the above functionality. 4. The Storage array must provide capability for thin provisioning of LUNs. Vendor should provide the necessary licenses in the proposed storage.	Request to remove both File and Automatic data tiering as both are not required for High Performance NVMe storages explained in previous points.	1. Inline data compression, deduplication, compaction and self-Encryption Space-efficient LUN, ~~file~~, and volume cloning ~~Automatic data tiering~~ 2. The storage system should support dynamic volume expansion. 3. Storage array should support multi pathing across controllers. Suitable license for connectivity should also be quoted if licensed separately to meet the above functionality. 4. The Storage array must provide capability for thin provisioning of LUNs. Vendor should provide the necessary licenses in the proposed storage.	Accepted
124		15	1. System should have capability to designate global hot spares that can automatically be used to replace a failed drive anywhere in the system. 2. The solution must provide automatic monitoring of the drive health and initiate proactive copy.	Each vendor has it's own mechanism of providing Hot Spare functionality and each shold be allowed fow wider participation. In fact Distributed spare enhances array performance and helps in faster disk rebuild than the tradtional method of	1. System should have capability to designate global hot spares that can automatically be used to replace a failed drive anywhere in the system. Or Storage should support Distributed Sparing. 2. The solution must provide automatic monitoring of the drive health and initiate proactive copy.	Accepted
125		17	1. Should be firmware upgradable for functionality improvements and enhancements. Must support nondisruptive upgrade of core software, BIOS, snapshot, clone remote mirroring and management software without shutting down the storage system. All host attached servers must be fully operational during system level or maintenance upgrade procedures.	Firmware upgrade without controller reboot will provide highest avaialbility for critical applications.	1. Should be firmware upgradable for functionality improvements and enhancements. Must support nondisruptive upgrade of core software, BIOS, snapshot, clone remote mirroring and management software without shutting down the storage controller ~~system~~. All host attached servers must be fully operational during system level or maintenance upgrade procedures.	Accepted

126		22	1. Management software must include both GUI and CLI tools. 2. Management of unified storage system should be through single management tool. The GUI must be able to configure all features, monitor the status and health of the storage system. Vendor should provide storage array management software for configuration, administration and monitoring. 3. Vendor shall offer the enterprise version of the software if there are multiple versions of the software. If licensed,separately, the vendor needs to provide necessary licenses for full capacity. 4. The storage array must provide performance monitoring, reporting, and tuning (QoS). The performance monitoring should be real-time and historical providing IOPS, Response Time and utilization of individual components within the storage for the entire duration selected. 5. If licensed separately, the vendor needs to provide the necessary licenses for full capacity. 6. Performance monitoring software, with license, to monitor, report and display complete array performance metrics of data, host connection data, port status, host port usage statistics, storage controller data, physical disk data,usage, disk performance, controller performance and replication performance to be included. 7. Provision to access the Monitoring software in local windows system for easy access, vendor needs to provide the necessary licenses for full capacity and premium features	Please remove Unified as NVMe storage is not required for file data and we don't support file on High Performance NVMe Storage.	1. Management software must include both GUI and CLI tools. 2. Management of ~~unified~~ storage system should be through single management tool. The GUI must be able to configure all features, monitor the status and health of the storage system. Vendor should provide storage array management software for configuration, administration and monitoring. 3. Vendor shall offer the enterprise version of the software if there are multiple versions of the software. If licensed,separately, the vendor needs to provide necessary licenses for full capacity. 4. The storage array must provide performance monitoring, reporting, and tuning (QoS). The performance monitoring should be real-time and historical providing IOPS, Response Time and utilization of individual components within the storage for the entire duration selected. 5. If licensed separately, the vendor needs to provide the necessary licenses for full capacity. 6. Performance monitoring software, with license, to monitor, report and display complete array performance metrics of data, host connection data, port status, host port usage statistics, storage controller data, physical disk data,usage, disk performance, controller performance and replication performance to be included. 7. Provision to access the Monitoring software in local windows system for easy access, vendor needs to provide the necessary licenses for full capacity and premium features	No Change
127		Appendix 02- (Bill of Material)	Stoage Box (DC and DR)	Request you to share No. of IOPs & Block size required (DC & DR)		Details are mentioned, please Refer RFP
128				Please share required Storage Pool details & hot spare disk for DC & DR stroage.		Details are mentioned, please Refer RFP
129		SLA- Page No.	Point No. 11 Delivery Schedule & Penalty for Delayed Deliveries	Request you to change the delivery period at least 10-16 Weeks.		No Change