Bank of Maharashtra
ONE FAMILY ONE BANK

12. Annexures

Annexure 1: Technical and Functional Requirements for Backup Solution.   Date:

Sr. No.	Parameter	Features Description	Comply (Yes/No)
1	**Analyst Rating**		
a		Backup software proposed should be in Gartner's leader quadrant of Gartner Magic Quadrant report of any last 5 years for Data Protection / Backup Software	
2	**Backup Platform**		
a.		Bank is looking for Disk to Disk to Tape Backup solution with one month backup data to be kept on disk for easy retrieval.	
b.		Should be able to de-duplicate data across backup and backup data sets to reduce storage footprint (using software / hardware based de-duplication).	
c.		Approximately 300 TB Front End Data/ 300 VMs has to be considered for sizing for the First year for both locations DC and DR separately. From second year onward additional 200 TB/ 200 VMs need to be considered for both locations DC and DR separately. Therefore, Total 500TB capacity/ 500 VMs is need to be consider for 5 Years from second year onward for both locations DC and DR separately. All necessary licenses and hardware (or appliances) required must be supplied for storing a minimum of **300 TB of Usable Capacity/300 VMs** on the de-duplication target at each site. Bidder has to quote required usable space as well as per OEM's recommendations consider Daily Full Backup. One Month Backup to be kept on Storage. Monthly and Quarterly Backup to be move on Tape for 1 year and 8 Year Retention respectively. Retention Policy will be as per RBI Guidelines and Bank's policy. The Cost of Hardware and / or Software required for additional 200 TB / 200 VMs required from second year need to be given as mentioned in Annexure 29 - Commercial Bill of Material.	
d.		Proposed purpose built backup appliance/Backup Solution with storage should have redundant components/HA mechanism in place to avoid Single Point of Failure and should have minimum of 4x16/32 GB FC ports &/or 2x10G ports on each controller for Host connectivity, and it should support FC/iSCSI protocols to meet the backup	

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		performance in point e. Proposed Backup Solution should have scalability with respect to ports and cache in future.	
e.		Proposed Backup Solution should support a Backup Window of 10 Hours or less for taking full Back up of 500 TB front end data to the proposed disk backup solution with a minimum throughput of 55TB/hr.	
f.		If Solution requires any Backup Servers as part of solution, Bidder should quote required servers in HA mode (at least Media Servers) along with required operating system, database licenses etc. Bidder to share public link or declaration from Backup Software / Appliance OEM that proposed backup server configuration is in line with Bank's requirements	
g.		Should support online backup and granular recovery of database platforms like Oracle, MS SQL, MySQL, PostgreSql, Sybase etc. Should support file and block based backup for Windows File System, UNIX/Linux File Systems, Microsoft SQL Server, MySQL, and IBM DB2.	
h.		Should be able to take backup from any of the major operating systems like Windows, Linux, Solaris and AIX.	
i.		Should be able to integrate with native backup interfaces of Hyper Converged Solutions in future agentless and/or image level backup of VMs	
j.		Should be able to protect data by backing it up to another disk target or tape target. All necessary licenses for achieving the functionality should be provided	
k.		Should support software based de-duplication to support any storage system, cloud repository and object storage as de- duplicated disk target	
l.		Solution provided should have horizontal scalability, allowing client indexes / de-duplication / search indexes and storage resources to scale across multiple servers and storage targets respectively and yet preserve single logical pool of resources for transparent and quick recovery	
m.		As a backup tool all audit trails must be logged for tracking any changes on backup server	

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n.		Should have the capability to invoke and manage native snapshot based backup for data residing on popular storage devices from Hitachi, Dell-EMC, IBM, HPE.	
o.		The Proposed enterprise backup software should have same GUI across heterogeneous platform to ensure easy administration.	
p.		Bidder must supply required Fibre and Network patch cables as per the solution requirement. Bidder may consider minimum length of 15 metre or above for fibre.	
q.		The proposed solution must support both disk to disk backup and disk to tape backup at the same time.	
r.		The Proposed solution must have capability to take online backup of shared disk configured in OS cluster and Oracle RAC solution	
s.		Proposed solution should have central Administration Console.	
t.		Proposed appliance should have the ability to perform different backup, restore, replication jobs simultaneously	
u.		Should have in-built calendar based scheduling system and also support check-point restart able backups for file systems. It should support various level of backups including full, incremental, differential, synthetic and virtual synthetic backups	
v.		The proposed solution should have inbuilt feature for extensive alerting and reporting with pre-configured and customizable formats. The proposed solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment, Replication etc.	
w.		The proposed backup solution should provide search capability from a web portal to allow search for a single file from complete backup.	
x.		The Storage must be with SSD, SAS with SATA/NL-SAS disks and enclosures within same storage system. The type of disk in the storage should fulfil the backup performance as mention in the point e.	
		The RAID offered in the offered product should be RAID-6 or equivalent.	

Sr. No.	Parameter	Features Description	Comply (Yes/No)
3	High Availability		
a.		Solution must have Redundant controllers or redundancy in case of Proposed backup Appliance (PBBA) /appliance/ storage, Redundant Power Supply on Servers/Appliance/Storage, Ports on Storage, RAID, etc.	
b.		Recovery of Failed components - Automatic failover of components must be provided as part of the solution for highest resiliency	
c.		The backup information must be readable from all target media (Disk, Tape or Cloud) in case of failure of backup media server	
d.		Should have the ability to configure redundant data paths for backup, to enable load balancing and dynamic path failover in case of hardware failure	
e.		Automated Data Verification while backing up the data and subsequently on media (disk and Tape) to ensure availability of data for successful restores should be supported	
f.		Data Management Master server should be configured in High availability mode.	
g.		Should have the ability to create a copy of tape media from primary tape media and also have the ability to create two simultaneous tape copies to protect against tape failures	
h.		The proposed backup server/appliance must support 8/16 Gbps Fiber Channel Interface (For LAN-Free backup) and 10 Gig Base T ports (For LAN Backup)	
4	Scalability		
a.		Should be able to support storage systems, supporting de- duplication across multiple arrays as and when they are added in the infrastructure pool	
b.		Performance Scalability should be achieved by adding more resources to the infrastructure pool in terms of servers and storage resources	
c.		As per the backup policy mention in the RFP, bidder to propose the usable storage capacity, it should be without de dup and compressed and after configuration of RAID6.	

Sr. No.	Parameter	Features Description	Comply (Yes/No)
5	Virtualization / Hypervisor Support		
a.		Should support image level backups of Hyper-V	
b.		Should support Image level backups of Vmware	
c.		Should support other popular hypervisors Like Vmware, Hyper-V RHEV, Openstack, OVM.etc.	
d.		Support for Online Application Aware backups and granular recovery using image level backup (for quick backup and restore) of VMs in Hyper-V, VMware, RHEV, Openstack and OVM.	
e.		Support for Change block tracking in Hyper-V and VMware hypervisors	
f.		Support for LAN Free backup to disk of VMs in Hyper-V and VMware hypervisors	
g.		Support for failing over the VM from one server to another in case primary server / site is down for Hyper-V and VMware	
h.		Solution should report the size of the VM, how much storage is occupied by the guest, and how much data is backed up after eliminating white spaces, etc.	
i		Support for Administrative Consoles which will allow VM administrators to configure, backup and recover their VMs on their own in a multi-tenant infrastructure.	
j.		Should have the ability to auto discover VMs from a VM cluster	
k.		Should be able to filter out the unwanted VMs from backup jobs (configurable)	
l.		Must support Agentless file recovery from VM images	
m.		Simultaneous multi VM backup and recovery support	
n.		Must support mounting of VM from backup set for verification and user access without having the need for restore to complete	
o.		Full VM restore / Partial VM restore support. It should capable of backup and restoration of individual file, Folders and mount points.	

Sr. No.	Parameter	Features Description	Comply (Yes/No)
p.		The Proposed enterprise backup software should support Non Staged Granular recovery in VMware.	
q.		The Proposed backup solution must support Instant recovery of VM from disk and seamless recovery from Tape.	
u.		Backup software should support agentless backups of applications/databases residing in VMs like SQL, Oracle, etc. with non-staged granular recovery of all these applications. It should support crash consistent VM level backup for all other workloads. Backup software should support SAP HANA backup integrated with HANA Studio	
5	**Oracle Support**		
a.		Backup solution must integrate with RMAN based backups to perform consistent oracle backups and recoveries	
b.		Should be able to perform block level backup and recovery of oracle databases	
c.		Should support Oracle online backups of Windows, Linux (RHEV, OEL, SuSE, etc.) and Unix flavours like Solaris, AIX, etc.	
d.		Should have the ability to take automated backups of Oracle DBs based on the size of the oracle logs and also the number of logs generated and truncate them automatically	
6	**Security**		
a.		Solution should support encryption of data while stored in Disk or Tape. Necessary licenses and hardware/software as required must be provided	
b.		Should support encryption of data while data is being transmitted from one site / server to another	
c.		Should have role based access control for users to perform specific actions	
d.		Should be able to integrate with active directory for ease of user creation and assigning permissions for administration	
e.		It should be possible to create a user, assign a role, delete a role, limiting user logon attempts and viewing users logged onto the backup server	
f.		It should be able to encrypt backup data, copies of backup data.	

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g.		Proposed Solution should have support for 256 Bit AES Encryption	
h.		Proposed backup software should be able to provide reliable protection against external cyber threats. This service will prevent backup copies of data from any corruption or ransomware attack. The solution should be able to restore any media (Tape/Disk) backup in case Backup solution gets infected.	
7	Licensing Methodology		
a.		Required Capacity Licenses/ VM base licenses/ Socket based license for Software and Hardware have to be provided for backup of data on physical servers, VMs and Applications (Including but not limited to Oracle Database)	
b.		**Bidder to consider at least 300 TB Front End Data / 300 VMs for First Year and Additional 200 TB / 200 VMs from second year onwards separately for DC and DR while proposing sizing and licenses. Backup Software should allow and ensure that separate Backup/Restore can be taken at each sites independently**	
c.		The proposed license should not pose a limit to the use of additional media or proxy servers required for backup. It should be possible to add media or proxy servers in the environment, as required, just by adding requisite hardware. Any additional licenses to support this have to be provided.	
e.		All required licenses for support the proposed Tape Library should be provided as per specifications.	
f.		All required licenses for redundant/failover backup servers/appliances have to be provided	
g.		All required OS, OS Cluster, Database and any other software to run the full functionality of Backup software should be provided by bidder with same level of warranty/support.	
8	Compatibility and Interoperability		
a		* Oracle Database in VMware, Hyper-V with RHEL and Windows OS * Oracle Database in all Power Server with AIX 7.x (Standalone Instances; Clustered Instances using	

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		AIX HA Features) * VMs with Windows 2012/2016/2019 and Latest OS, * VMs with Linux OS (RHEL, CentOS, Ubuntu etc) * Third Party and Inhouse Developed Applications running in Redhat Linux 8.x/7.x, * Third Party and Inhouse Developed Applications running in Windows 2012/2016 VMs in VMware vSphere * Third Party and Inhouse Developed Applications running in Windows 2012/2016 Servers (Physical Servers) * Microsoft SQL Servers (Physical and Virtual) * Sybase database in VMware, Hyper-V with RHEL and Windows OS. * MySQL, MongoDB, Postgres, IBM DB2 database in VMware, Hyper-V with RHEL and Windows OS.	
9	**Warranty/ATS**		
a.		3 Years Warranty and 2 Year AMC for all Hardware, 1 Year Warranty and 4 Year ATS support for all Software and 5 Years 24/7 Premium Support for Hardware, Software Support, Bug Fixes, etc.	
b.		Bidder should provide L1/L2 Onsite Support for proposed hardware and software components.	
c.		Response time 2 hrs, resolution time 6 hrs and parts replacement to be done within 24 hours of call logged.	
d.		Bidder must back-align support with respective OEM mandatorily during warranty period and also during AMC period. Bidder must provide documentary proof.	
10	**Standard 42U Rack**	Bidder to provide 42U rack to house the backup solution, with the following minimum specifications: 42U, 600 mm wide and 36 no IEC C13 & 6no IEC C19 socket per PDU, redundant PDU	
11	**Tape Library**	**1 Set at Each Site (DC and DR)**	
a.	**Architecture & Capacity**	The offered Automated tape Library should be supplied with minimum 8 x LTO 8 FC Tape drives and 240 Slots all activated and ready to use. Bidder may size Tape Library higher than the above configuration based on the OEM recommendations. The BANK will factor more consumables as and when required in the future.	

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b.	**Future Scalability**	The Tape Library must be further scalable to more than 20 LTO 8 FC TAPE drives & required Slots as and when required by the END USER within the same chassis or by stacking of expansion modules. All the Slots and Drives must be seamlessly accessible by the Single Robotics.	
c.	**DATA TRANSFER RATE**	Each of the LTO8 drive shall support 300 MB/sec in Native mode and 750MB/sec in 2.5:1 Compressed mode.	
d.	**ENCRYPTION SUPPORT**	The offered Automated tape Library must support encryption. The overall solution offered with the Tape Library should provide either AME or LME encryption key management. The necessary backup s/w /Licence required must be provided by the System integrator, to keep the Encrypted keys in a Redundant and safe location.	
e.	**Connectivity & Integration**	1. Offered Tape Library should be integrated with the other Servers and storage to back up all the data from the SAN to The Tape library using the required back up S/w via LAN or LAN Free methodology for optimised Backup speed. The Bidder needs to supply the necessary Back up s/w to integrate this functionality. 2. Tape Library should be certified with industry leading backup software vendors like Commvault , Veritas, Veeam, IBM TSM and EMC Networker.	
f.	**HARDWARE PARTITION**	The offered Automated tape Library must support partitioning so that each drive can be configured in a separate partition thus providing the ability to utilize a single library in a variety of applications. All the necessary Licence or hardware for min 8 partitions scalable to 20 Partitions must be provided along with the library.	
g.	**REMOVABLE CARTRIDGE MAGAZINES**	The Offered Tape Library must be provided with Removable cartridge magazines facilitate the loading, unloading and offline storage of data cartridges, reducing media handling costs.	
h.	**RELIABILITY**	RELIABILITY: The offered tape library must have a high reliability ie MSBF (mean SWAPS between failures) more than 3,000,000 cycles.	
i.	**Management**	Tape Library shall provide web based remote management.	

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j.	INTELLIGENT MONITORING:	The overall solution with Tape Library and the backup s/w integration should have features like Intelligent monitoring management and diagnostics	
k.	Barcode Reader and Mail slots	Tape library shall support Barcode reader and min 10 mail slots- to deliver easy, secure access to individual tape cartridges without interrupting library operations. Mail slots must be scalable along with tape library	
m.	OTHER FEATURES	1.] Tape Library shall have GUI Panel 2] The Tape library must Set alerts for backup and archive events. 3] The tape library must have front TOUCH SCREEN PANEL	
n.	Warranty	1. 3 Years Warranty and 2 Year AMC for all Hardware, 1 Year Warranty and 4 Year ATS support for all Software and 5 Years 24/7 Comprehensive Onsite Warranty Support with 2 Hours Response Time and 24 hours resolution time for other than hardware failure. In case of hardware failure, spare replacement/repair should be done within 48 hours of call log. 2. Bidder should provide L1/L2 Onsite Support for proposed hardware and software components, 3. Bidder must back-align support with respective OEM mandatorily during warranty period and also during AMC period. Bidder must provide documentary proof.	