	Bank's backup software (CA Brightstor) and hardware (Actidata / Tandberg Tape Library)		
3.4.Storage Tiers	3.4.a. Storage must be able to support all online data storage tiers in order to maximize both system performance and capacity scalability.		
4. TECHNOLOGY			
4.1.Tier Storage Classification	4.1.a. Proposed storage must be at least a Tier 1 Storage Class		
	4.1.b. Proposed storage must also include storage tiering technology, with the capability to intelligently manage data lifecycle to the most efficient and effective appropriate storage type according to purpose and usage.		
4.2.Integrated Technology	4.2.a. Must be integrated with Fiber Channel solutions		
4.3.Thin Provisioning	4.3.a. Must have the capability to power disk drives down or virtualization when not in use to minimize power consumption for long term data retention needs such as backup, archiving and large data set analysis		
	4.3.b. Must be able to over-provision applications in order to reduce physical storage capacity requirements		
	4.3.c. Must be able to migrate data from one RAID type or set of drives to another without impacting applications within the same system		
4.4.LUN Support	4.4.a. Can partition and support at least 512 LUN		

AS 04/13/16

4.5.Data Mobility	4.5.a. Depending on production performance requirement, volumes can be moved online from one storage pool to another storage pool with no downtime incurred.		
4.6.Instant Copy / Snapshot Feature	4.6.a. Support for automatic volume snapshot function		
	4.6.b. Snapshot should at least be based on Copy-on-Write snapshot technology		
	4.6.c. Snapshot must be done within the disk array and not based on host snapshot technology		
	4.6.d. Support up to 128 snapshots for each production volume.		
	4.6.e. Each virtual storage group can support at least 4,000 snapshots on the whole storage		
	4.6.f. Each snapshot copy is not dependent on one another. Can delete one snapshot without affecting or deleting another snapshot.		
	4.6.g. Snapshot volumes can be used for online data recovery if production volume is corrupted.		
	4.6.h. Snapshot volume support and can be used for either read-only or read and write access.		
	4.6.i. Snapshot can be initiated manually or automated using snapshot scheduling.		
4.7.Replication	4.7.a. Must support automatic clone volume copy function		

AG 04/15/15

	4.7.b. Must support remote data replication enabling remote disaster recovery data protection function.		
	4.7.c. Volume replication can be initiated either initiated or scheduled automatically at a configured level.		
	4.7.d. Data mirroring between two sites must have an option to leverage on the Bank's replication utilities other than those native to the storage system		
	4.7.e. After activating disaster recovery using the remote volumes, the fail back process back to the production site will only copy back the delta changes and not the whole data volume.		
	4.7.f. Replication feature must also have the capability to directly restore to the source storage from the backup copy on the remote storage		
	4.7.g. The backup copy from the replica functionality must also be transferrable to tape media and restore from tape is also a required functionality		
	4.7.h. Must be able to perform replication function on the source storage to the remote storage regardless of the data use whether online or offline		
	4.7.i. Replicated volumes should support Thin Provisioning with only the actual used space is copied over		

A7 6थ/15/15

5. AVAILABILITY			
5.1.No Single Point of Failure / System-Level Availability	5.1.a. Proposed storage must be able to provide 99.999% availability		
	5.1.b. Online hot-swapping and replacement of power supplies, fans, hard drives and array controllers		
	5.1.c. Redundant power supplies, fans, hard disk controller.		
5.2.Data Protection	5.2.a. Must be resilient to manage multiple disk failure without data loss and performance impact		
	5.2.b. Support for RAID5, RAID6, RAID10 technology or better		
	5.2.c. Support background disk scanning to ensure data integrity; monitor and control to ensure that end-to-end data protection		
5.3.Site-Level Availability	5.3.a. The storage should be able to support synchronous and asynchronous replication		
	5.3.b. Should support a native replication transport via Fiber Channel		
5.4.Hot Spares	5.4.a. Must be able to provide automated monitoring of disk drive health and be able to initiate a proactive background drive rebuild on failing drives.		
	5.4.b. Rebuild for a minimum 1TB drive should have little or no rebuild process overhead and performance impact.		

A8 04/15/15

	5.4.c. Must be able to support global hot spares for the offered number of disk drives or better		
	5.4.d. The number of hot spares allocated must be able to mitigate multiple disk failure and massive disk malfunction of at least 10% of the total drives configured in the system or better		
	5.4.e. Support redundant Dual controllers and capable of failover if one of the controller fails		
	5.4.f. Support online hot-swap controller replacement without shutting down the storage array		
	5.4.g. Each controller must have separate access paths to all of the disks		
	5.4.h. All storage capacities within all storage arrays must be made available to the controllers on demand and should not cause fragmented or stagnant wastage		
	5.4.i Support redundant power supply modular design		
5.5.Multi-pathing / Load Balancing	5.5.a. The storage must support load balancing and multi-pathing feature for redundancy and performance considerations.		
	5.5.b. Multi-pathing and load-balancing software should be provided		
	5.5.c. Multi-pathing software features must include the following: a. multiple loading-balancing options		

04/15/15

	b. option for manual write throttling c. channel groups management d. support for storage encryption		
	5.5.d. Must be able to distribute the workload evenly across all hardware component at all times regardless of access patterns		
	5.5.e. Must be able to balance data on all system components eliminating the possibilities of a hot-spot being created		
5.6.Non-Disruptive Upgrades	5.6.a. The storage should support non-disruptive firmware upgrades		
6. MANAGEMENT			
6.1.Fault Detection and Isolation	6.1.a. Storage must have capability to collect fault conditions and should be able to activate call home feature to speed up problem identification and resolution		
6.2.End-to-End Service Level Management	6.2.a. Storage system must have the capability to support Quality of Service functionality		
6.3.Storage Array Configuration and Management Software	6.3.a. Storage must include a web-based storage configuration and management software, and disk monitoring with no additional cost		
	6.3.b. Storage management software must include the following functionality but not limited to: a. Virtualization b. Thin Provisioning c. Data Instant copy/snapshot d. Local and distant replication e. Data migration		
	6.3.c. Storage management software must be able to administer to at least 12TB of storage		

AlO 04/15/15

	6.3.d. Storage management software must include security access features that is role-based, for different access privileges for the storage administrators and computer operators		
	6.3.e. Storage management software must be able to generate storage allocation and capacity reports on PDF or equivalent non-editable documents		
	6.3.f. Storage management software must be able to generate performance, including storage throughput, utilization and fault reports on PDF or equivalent non-editable documents		
	6.3.g. Support Email or SNMP protocol for system administrator alert notification		
7. WARRANTY AND SUPPORT			
7.1. Storage Support	7.1.a. Proposed storage must include three (3) years warranty on parts and labor		
	7.1.b. Must be inclusive of quarterly preventive maintenance		
	7.1.c. Must include 24/7 local and remote technical and help desk support		
	7.1.d. Remote technical and help desk support to be provided to Landbank must include desktop sharing capability for speedy troubleshooting and problem resolution		
	7.1.e. Must include onsite support for severity one (1) issues		

All 04/15/15

	7.1.f. Must include onsite support for non-incident related issues which includes storage configuration customization, performance and data storage use optimization ; Man days for onsite support must not be less than 50 days per year and part of the support and maintenance agreement		
	7.1.g. Support must always be available and accessible on demand as part of the support and maintenance agreement		
	7.1.h. The support and delivery services specified are exclusive for this storage model/product and must not be related to other storage models/products that are not part of the terms of reference or the contract unless otherwise specified		
7.2. Personnel Qualification	7.2.a. Support personnel must be certified on the storage model/product line with at least five (5) years' experience in disk storage management and maintenance		
	7.2.b. Support personnel must also be certified, knowledgeable and experienced on with connectivity and configuration with midrange servers and operating systems mentioned in sections 3.1 and 3.2 of this document		
	7.2.c. Curriculum vitae of at least two (2) onsite support personnel must be provided in the bidding document		
7.3. IT Disaster Recovery Drills	7.3.a. Must provide support for four (4) quarterly annual LBP IT Disaster Recovery Drills		

	7.3.b. Support must include four (4) man days on data and storage recovery strategy preparation before each disaster drill and onsite support during the drill proper		
	7.3.c. Support for LBP IT Disaster Recovery Drills will form part of the support and maintenance agreement		
7.4. Offline Storage System Activity	7.4.a. Must provide onsite and remote support for host upgrade and migration activities as part of the support and maintenance agreement		
	7.4.b. Must provide onsite and remote support for storage upgrade and data migration activities as part of the support and maintenance agreement		
	7.4.c. Must provide onsite and remote support for storage related downtime activities which include repairs, preventive maintenance, and data center (head office and offsite) power supply maintenance		
7.5. Onsite Health Check	7.5.a. Must include at least four (4) man days per quarter for storage system health checks which will form part of the support and maintenance agreement		
	7.5.b. Must provide a service or activity report on the checks performed on the storage, including health status and recommendations on storage availability improvements and maintenance		
	7.5.c. Storage health check specified man days not fully consumed may be convertible to trainings or education credits		

A13 04/15/15

8. TRAININGS			
8.1. Training on Storage Management and Use	8.1.a. Proposed storage system must include education credits for basic and advance storage management of the storage model		
	8.1.b. Proposed storage system must include at least five (5) training days on storage management for storage administrators, technical support and operations personnel		
	8.1.c. The vendor must also include a preliminary training plan on the training courses to be carried out including the following: • Course Title and Description • Learning Objectives • Class Composition • Course Duration • Training Sequence		
	8.1.d. The vendor must provide for the necessary training logistics and paraphernalia for the participants' needs with no additional cost to the Bank (10 personnel)		
9. SERVICES			
9.1. Basic Delivery Services	9.1.a. Proposed storage system must include services such as delivery to site, setup, installation and configuration of all hardware and software components		
	9.1.b. Setup, installation and configuration activities must also include joint inventory of all hardware and software components		
	9.1.c. Services must include performing setup, installation and configuration to host servers or logical partitions		

A14 04/15/15

	9.1.d. Services must include implementation of the storage technology functionalities specified in this document and features that are inherent to the storage system		
	9.1.e. Proposed storage system must include host and data migration services		
	9.1.f. Storage system must be configured to at least 25 servers or LPARs on a staggered implementation basis		
9.2. Skills Transfer	9.2.a. Must provide skills transfer on the operations of the configured storage hardware and software; LBP IT personnel must be able to apply the new knowledge and skills on the storage system		
	9.2.b. Services must include transfer of technology to LBP IT personnel which includes but not limited to : i. creation and implementation of policies for storage tiering ii. creation and implementation of local instant copy (within the local storage system) iii. creation and implementation of two-site storage replication to and from the BRS iv. creation and implementation of storage allocation for use by a server or LPAR		
10. GENERAL AVAILABILITY			
10.1. Product Offering	10.1.a. Proposed storage model for both sites should be brand new		
	10.1.b. The storage model /product line should not be more than two (2) years old in the market, starting from the date		

A/S 04/15/15

	of the pre-bid conference for this requirement		
	10.1.c. The proposed storage model/product should be verifiable via published public documents or thru the product's website		
10.2. Delivery	10.2.a. Must be able to deliver the storage system and related components within 45 calendar days to both installation sites upon receipt of the Purchase Order		
	10.2.b. Setup of storage must commence in one site starting at the third business day from the date of delivery		
11. REFERENCE			
11.1. Implementation	11.1.a. Must have a similar storage implementation of a minimum of 10 TB or more in at least two organizations in the Philippines, and is referential		
	11.1.b. Must have an install base on local and remote data mirroring implementation in at least two organizations, and is currently operational and referential		
	11.1.c. All site references must be certified by the client		
12. OPERATIONAL REQUIREMENTS			
12.1. Site Survey	12.1.a. Prior to submission of bidding proposal, the vendor must conduct a site survey for the target storage installation sites. The survey is necessary to ensure that the storage system will be able to function properly and according to expectation.		

	12.1.b. The necessary operational requirements will be part of the bidding proposal and must not entail additional cost to the Bank		
	12.1.c. The necessary operational requirements must be sufficient enough to enable the operation of the storage system, without major modifications on the sites' structural design		
	12.1.d. The necessary operational requirements modifications must at least follow the Bank's existing site and structural design		
	12.1.e. The vendor must provide for the required electrical supply of the storage system which includes cables and necessary wiring to the UPS and provision for circuit switches and breakers		
12.2. Deployment	12.2.a. The vendor must be able to determine the appropriate product for Landbank's storage requirements, including those specified in this document. The vendor must size the necessary prerequisites, including storage hardware peripherals to be able to implement the storage system requirement		
	12.2.b. The vendor must provide for all storage cables that are compatible to the existing CPU and tape subsystem host adapter protocols		
	12.2.c. The vendor must also include spare storage cable provisions for future host upgrade or migration activities		

A17

09/15/15

13. DOCUMENTATION			
13.1 Configuration, Operation, and Deliverables	13.1.a. The vendor must provide documentation on the storage system configuration, which includes but not limited to capacity and performance base lining, connectivity diagrams of attached hosts to storage—these documentation will serve as additional inputs during health checks, problem determination and issue resolution.		
	13.1.b. The vendor must provide documentation on every deliverable specified in this document to record completion.		
	13.1.c. The vendor must provide documentation on storage operations and must be written in English of durable construction with concise and high quality presentation to include but not limited to the following: 1. User Manuals 2. Technical / Reference Manuals 3. System / Operation Manuals 4. Troubleshooting and Installation Guides		
13.2 Media and Format	13.2.a. All documentation must be in hard and soft copies; Soft copies must be stored either on a compact disk or USB drive; Soft copy documentation must be in a non-editable format		
	13.2.b. All software used for the implementation of the storage system must be provided with installation media		
13.3 Ownership	13.3.a. All documentation shall be the property of the Land Bank of the Philippines and shall reserve the right to reproduce at no additional cost		
END of Terms of Reference			