



TECHNICAL SPECIFICATION FOR THE SUPPLY, DELIVERY, INSTALLATION AND CONFIGURATION OF HARDWARE AND SOFTWARE COMPONENTS FOR THE UPGRADE OF THE CURRENT DATA WAREHOUSE INFRASTRUCTURE

Instructions on responding to this Terms of Reference (TOR) Document

- a. The vendor/bidder understands and agrees that the requirements specified in this document are deliverables for the proposed technical specification for the supply, delivery, installation and configuration of hardware and software components for the upgrade of the current data warehouse infrastructure.
- b. All deliverables, its specifications and functionalities, must be satisfied including its necessary prerequisites without additional cost to the Bank.
- c. The vendor/bidder must answer at the third column whether the [solution requirement] complies or not—answer must be **YES** or **NO**.
- d. The REMARKS column in the table is to be filled out according to the response in the third column:
 - d.1. If answer to the third column is YES: REMARKS column is to be filled out with the complete and specific reference to the supporting document included in the bidding document to support answer/claim.
 - d.2. If the answer to the third column is NO: REMARKS column is to be filled out with the justifications why the proposed additional capacity cannot meet the specified requirement; include the complete and specific reference to the supporting document included in the bidding document to support answer/claim.

The supporting documents, cited references to the TOR should be indexed or labeled accordingly for easy identification and validation.

LANDBANK EXADATA REFRESH TERMS OF REFERENCE

CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
1. PROJECT SCOPE			
1.1. Scope	1.1.a. The bidder shall supply, deliver, install and configure hardware and software components for the upgrade of the current data warehouse infrastructure: Two (2) Database Servers - <ul style="list-style-type: none"> • Fourty eight (48) cores each • Three hundred eighty four (384) Gb memory each Three (3)Storage Servers (for		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	SQL offload)- <ul style="list-style-type: none"> • <i>Thirty two (32) cores each</i> • <i>One hundred ninety two (192) Gb memory each</i> Management Server <ul style="list-style-type: none"> • <i>Sixteen (16) cores</i> • <i>One hundred twenty eight (128) Gb memory</i> • <i>Five (5) Tb disk capacity</i> Storage Capacity (raw) <ul style="list-style-type: none"> • <i>Five hundred four (504) Tb disk</i> • <i>Seventy seven (77) Tb Flash storage</i> 		
	1.1.b. The bidder shall migrate the contents and configuration of the current data warehouse infrastructure to the new infrastructure with additional fifty (50) Oracle enterprise database licenses for future projects.		
2. TECHNICAL SPECIFICATIONS			
2.1. Datawarehouse Infrastructure Requirements	2.1.a. The proposed solution should be an integrated system that should contain server, networking and storage infrastructure		
	2.1.b. The offered solution should be offered/packed and shipped as a "ready to use" system installed in a standard 42U rack with all the internal network cabling between components (server, storage, switches)		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	2.1.c. The proposed solution should include: <ul style="list-style-type: none"> • Compute Servers • Storage Servers • Network Equipment 		
	2.1.d. The proposed solution should support linear scalability of Database Servers up to 8 Database Servers		
	2.1.e. The proposed solution should support linear scalability of Storage Servers up to 14 Storage Servers		
	2.1.f. The proposed solution should support different configurations of Storage Servers capacity wise or performance/flash wise		
	2.1.g. The proposed solution should be designed with specifically chosen hardware components, all pre-integrated in the rack to operate as a cohesive whole, reducing the cost and complexity of IT infrastructures while increasing productivity and performance		
2.2. Database Servers	2.2.a. Minimum 2 physical database servers per rack		
	2.2.b. Each server should be equipped with two x86 CPUs with at least 24 core each and a clock speed of minimum 2.4 GHz. The server should have at least 48 cores per database server		
	2.2.c. Each server should have at least 384 GB (type: DDR4-2666 and up) memory installed, upgradable to 1.5 TB		
	2.2.d. Each server should be		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	equipped with 4 x 1.2TB 10k rpm SAS-3 HDDs		
	2.2.e. Each server should have SAS-3 12Gb RAID HBA with 2GB Supercap-backed cache or better		
	2.2.f. Each server should have at least two integrated 10G Base-T Ethernet ports and two SFP28 25GbE ports		
	2.2.g. Each server should include 1x dual port InfiniBand QDR CX3 adapter		
	2.2.h. Each server should include 1x Dual-port 10/25GbE SFP28 PCIe adapter		
	2.2.i. Each server should have integrated dedicated 1GbE management port		
	2.2.j. Each server should have redundant and hot swappable power supplies		
	2.2.k. The database servers should be 1U rack ready servers and already installed in the proposed integrated solution		
2.3. Storage Servers	2.3.a. For high-availability purpose, the proposed solution should include at least 3 physical Storage Servers		
	2.3.b. The proposed solution should support scalability up to 14 Storage Servers per rack		
	2.3.c. Each Storage server should have at least two x86 CPU with minimum 16 cores per CPU and a clock speed above 2.3GHz		
	2.3.d. Each storage server		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	should be equipped with at least 192GB RAM using DDR4-2666 DIMMs or better		
	2.3.e. Each storage server should be equipped with 12x 14TB 7200 rpm SAS-3 HDDs		
	2.3.f. Each storage server should have SAS-3 12Gb RAID HBA with 2GB Supercap-backed cache or better		
	2.3.g. Each storage server should include at least 4 x 6.4TB NVMe PCIe Flash Cards or greater		
	2.3.h. Each storage server should include dual port InfiniBand QDR (40 Gb/sec) adapter		
	2.3.i. Each storage server should have integrated dedicated 1GbE management port		
	2.3.j. Each server should have redundant and hot swappable power supplies		
	2.3.k. Storage servers should be maximum 2U rack ready servers and already installed/cabled and preconfigured in the proposed integrated solution		
2.4. High Speed Network Switches	2.4.a. The integrated solution should include InfiniBand type switches for high speed connectivity		
	2.4.b. Each InfiniBand switch should have at least 36 QDR InfiniBand Ports		
	2.4.c. Each InfiniBand switch should have redundant cooling fans and power		
	2.4.d. InfiniBand switches should support passive		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	copper cables for distances lower than 5m and active fiber cables for distances longer than 5m		
	2.4.e. Each InfiniBand switch should support minimum 2.3Tb/sec - bidirectional data traffic		
	2.4.f. Each port should have maximum 100ns QDR latency		
	2.4.g. Each switch should have integrated software for monitoring and management		
	2.4.h. Each switch should have minimum 2 Ethernet 100Base-T and one USB port dedicated for management		
	2.4.i. Each switch should have redundant and hot swappable power supplies		
2.5. Management Switch	2.5.a. Should have minimum 48 x 1GBase-T ports with RJ45 connectors and minimum 6 x 40/100 Gb/sec QSFP28 ports (uplink)		
	2.5.b. Ethernet switches should be rack ready with 1 rack unit		
	2.5.c. Hot-swappable redundant power supplies		
	2.5.d. Hot-swappable redundant fan trays		
2.6. Integrated Monitoring Software	2.6.a. The proposed solution should include management and configuration software that can handle and monitor all hardware and software resources of the given system		
	2.6.b. Support for creating users with specific level of access that can manage and monitor the whole hardware system		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	2.6.c. Real time management and monitoring for all the resources of the system		
	2.6.d. The management software should have integrated features for automating of the installation, configuration and management of the entire appliance		
	2.6.e. The management software should have features for rapid deployment		
2.7. Software Specifications	2.7.a. The bidder must provide all necessary software or licenses not mentioned in this document to ensure operation and licensing compliance of the proposed solution		
2.8. Other Hardware Requirements	2.8.a. The bidder is required to provide all necessary hardware, devices and peripherals required to connect all proposed hardware requirements to existing LANDBANK LAN and SAN. This includes, but is not limited, to the following: <ul style="list-style-type: none"> • FC cables • UTP cables (patch) • Connectors (SFPs) 		
3. FEATURES AND FUNCTIONALITIES			
3.1. Analytics	3.1.a. Automatic Parallelization and Offload of Data Scans to storage		
	3.1.b. Filtering of Rows in Storage based on 'where' clause		
	3.1.c. Filtering of Rows in Storage based on columns selected		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	3.1.d. Storage Offload of JSON and XML Analytic Queries		
	3.1.e. Filtering of rows in Storage based on Join with other Table		
	3.1.f. Hybrid Columnar Compression		
	3.1.g. Storage Index Data Skipping		
	3.1.h. I/O Resource Management by User, Query, Service, DB, etc.		
	3.1.i. Automatic Transformation to Columnar Format in Flash Cache		
	3.1.j. Smart Flash Caching for Table Scans		
	3.1.k. Storage Offload of Index Fast Full Scans		
	3.1.l. Storage Offloads of Scans on Encrypted Data, with FIPS compliance		
	3.1.m. Storage offload for LOBs and CLOBs		
	3.1.n. Storage offload for min/max operations		
	3.1.o. Data Mining Offload to Storage		
	3.1.p. Intelligent Routing Across All InfiniBand Ports and Links to Minimize Congestion		
	3.1.q. Reverse Offload to DB servers if Storage CPUs are Busy		
	3.1.r. Automatic Data Columnarization in Flash Cache		
	3.1.s. Automatic Conversion of Data to In-Memory Formats when Loading into Flash Cache		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
3.2. OLTP	3.2.a. Database Aware PCI Flash		
	3.2.b. Smart Flash Caching		
	3.2.c. Smart Flash Logging		
	3.2.d. Smart Write-back Flash Cache		
	3.2.e. I/O Prioritization by DB, User, or workload to ensure QOS		
	3.2.f. Direct-to-Wire OLTP Protocol		
	3.2.g. Database Intelligent Network Resource Management		
	3.2.h. System full-stack validation checking capability		
	3.2.i. Full-stack security scanning		
	3.2.j. Database scoped security		
	3.2.k. Cell-to-Cell Rebalance preserving Flash Cache and Storage Index		
	3.2.l. Full-Stack Secure Erase		
	3.2.m. Compatible with Oracle VM and InfiniBand SRIOV		
	3.2.n. Automated InfiniBand Partitioning for Workload Isolation		
	3.2.o. Instant Data File Creation		
	3.2.p. Smart Fusion Block Transfer		
	3.2.q. Control of Flash Cache Size per Database		
3.2.r. In-Memory OLTP Acceleration			
3.2.s. Undo-Block Remote RDMA Read			

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	3.2.t. Support for More Than 252 Pluggable Databases with Multitenant Option		
3.3. High Availability	3.3.a. Instant Detection of Node or Cell Failure		
	3.3.b. In-Memory Fault Tolerance		
	3.3.c. Sub-second Failover of I/O on stuck disk or Flash		
	3.3.d. Offload backups to storage servers		
	3.3.e. Extended H.A.R.D. Data Validation		
	3.3.f. Prioritize Recovery of Critical Database Files		
	3.3.g. Automatic Repair of Corrupt Disk Data By Reading Other Storage Servers		
	3.3.h. Avoidance of Read I/Os on Predictive failed disks		
	3.3.i. Confinement and power cycle of temporarily poor performing drives		
	3.3.j. Shutdown Prevention If Mirror Storage Server is Down		
	3.3.k. Detection and Disabling of Unreliable Network Links		
3.3.l. Preservation of Storage Index on Rebalance			
4. WARRANTY AND SUPPORT			
4.1. Warranty	4.1.a The proposed hardware and software components for the upgrade of the current data warehouse infrastructure must include one (1) year hardware and software warranty on all labor and parts free of charge		
	4.1.b. The warranty must include 24/7 access to software and hardware specialists for one (1) year		
	4.1.c. The warranty must		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	cover onsite hardware service and part replacement on a 24/7 basis with 4-hour onsite support for critical incidents for one (1) year		
	4.1.d. The warranty solution must include proactive monitoring, embedded hardware diagnostics and automated service requests for one (1) year		
	4.1.e. The warranty must include critical software updates and bug fixes for one (1) year		
	4.1.f. The warranty must include 24/7 remote fault monitoring, accelerated response times and patch deployment services for one (1) year		
	4.1.g. The bidder must provide a web-based, searchable knowledge base of common problems and solutions. The winning bidder shall assist in the UAT and QA activities of the proposed solution prior production cut-over and ensure that all tests will pass based on the standards		
	4.1.h. The bidder shall assist in the cut-over activities for production implementation of the proposed solution and ensure successful cut-over based on the standards		
	4.1.i. The bidder shall provide post migration activities and monitoring to ensure optimal operation of the proposed solution		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
4.2. Support Service	4.2.a. The bidder shall install and configure the proposed solution in preparation for the migration of existing data warehouse contents and configuration		
	4.2.b. The bidder shall install the latest available and compatible software versions in the proposed solution		
	4.2.c. The bidder shall create a baseline of all configuration and performance metrics of the existing data warehouse infrastructure prior migration of systems		
	4.2.d. Must include 24/7 local and remote technical and help desk support for one (1) year		
	4.2.e. Must include onsite support for one (1) year for a severity one (1) issues. LBP SLA on incident and problem management will be observed		
	4.2.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 fifty (50) days for one (1) year and part of the support and maintenance agreement		
	4.2.g. Must include quarterly preventive maintenance and health check for one (1) year		
	4.2.h. Support must always be available and accessible on demand as part of the		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	<p>support and maintenance agreement</p> <p>4.2.i. The support and delivery services specified are exclusive for the proposed hardware model/product and must not be related to other hardware models/products that are not part of the terms of reference or the contract unless otherwise specified</p>		
4.3. Reseller Qualification	4.3.a. The bidder must be a certified partner or reseller of the proposed solution, and must provide proof or documentation in the form of a certificate issued by the manufacturer.		
	4.3.b. The bidder must have a certification minimum of Gold partnership/reseller level with the manufacturer.		
	<p>4.3.c. The vendor must provide a certification of satisfactory performance:</p> <p>1. Certification from LANDBANK-DCMD, or</p> <p>2. If not a current or previous service provider of LANDBANK, the prospective vendor/bidder should submit two (2) certifications;</p> <p>a. One (1) reference from a 2019 top 10 Philippine Universal or Commercial bank</p> <p>b. One (1) reference from a company involved in a different industry.</p>		

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	<p>Note: Certificate of Satisfactory Performance for 4.3.c.2 must be for a product similar to being proposed.</p>		
	<p>4.3.d. The bidder must comply to the Bank's compliance requirements (eg. Technology Service Provider Assessment (TSP), Vendor Assessment Report (VAR), etc).</p>		
<p>4.4. Manpower Requirement</p>	<p>4.4.a. The bidder must have at least one (1) locally available certified personnel for the duration of the project implementation with certification on the following:</p> <ol style="list-style-type: none"> 1. Database Administration Certification 2. System Administration for Converged Infrastructure Certification 		
	<p>4.4.b. The bidder must utilize certified hardware/software engineers duly authorized by the manufacturer to perform hardware/software implementation and configuration. List of personnel with detailed resume must be submitted.</p>		
	<p>4.4.c. The bidder must provide a certified Project Manager who will manage and oversee the implementation of the project. The bidder must provide certification recognized by international organization such as Project</p>		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	<p>Management Professional (PMP) and/or Projects IN Controlled Environments (PRINCE2). The Project Manager must be directly employed with the company for at least six (6) months prior to submission of the bid. Detailed resume on experience and training must also be submitted</p>		
5. TRAINING			
<p>5.1. Training</p>	<p>5.1.a. The winning bidder shall provide classroom type (instructor-led) training for the following:</p> <ul style="list-style-type: none"> a. Oracle Linux 7: System Administration (at least three (3) system administrators for five (5) days b. Oracle Database: Administration Workshop (D105916) (at least three (3) system administrators) for five (5) days c. Financial Crime and Compliance Management Training (at least two (2) system administrators) for five (5) days 		
	<p>5.1.b. Proposed integrated system must include SKILLS TRANSFER for a minimum of five (5) training days upon setup valid for 1 year for at least ten (10) storage administrators, technical support and operations personnel.</p>		
6. REFERENCE			

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
6.1. Client Reference	6.1.a. The bidder must have at least two (2) existing local clients for Engineered Systems or Converged Infrastructure of the proposed solution other than LANDBANK, and must provide copy of P.O. or Contract or Acceptance Document		
7. SERVICES			
7.1. Product Offering	7.1.a. Proposed solution must include services such as delivery to site, setup, installation and configuration of all hardware and software components		
	7.1.b. For this requirement, the proposed solution should not be more than two (2) years old on the date of the pre-bid conference starting from its first release in the international market. Documentary proof must be submitted from the manufacturer that the model/product is not more than two (2) years old in the market.		
	7.1.c. The proposed solution should be verifiable via published public documents or thru the product's website.		
7.2. Delivery	7.2.a. Must be able to deliver within 45 calendar days to the Head Office site upon receipt of the Notice to Proceed		
	7.2.b. Setup of proposed solution must commence in production site (Headoffice) starting at the third calendar day from the date of delivery		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	and should be completed within 30 calendar days.		
7.3 Payment Milestone	7.3.a. Fifty (50%) payment milestone is achieved upon delivery of the proposed solution and fifty (50%) upon completion of installation and configuration of the proposed solution		
8. OPERATIONAL REQUIREMENTS			
8.1. Site Survey	8.1.a. The site inspection will be conducted on February 11, 2020 8:00am-5pm. Contact person will be Ladybird Carag; contact number 8-5220000 local 7600 Non-disclosure Agreement signed by the bidder's authorized representative must be submitted during the conduct of site inspection. Certificate of Inspection will be issued by DCMD Head for the bidders who will conduct site inspection which shall be form part of the bid proposal.		
	8.1.b. The necessary operational requirements will be part of the bidding proposal and must not entail additional cost to the Bank		
	8.1.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		

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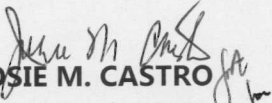
CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
	8.1.d. The Vendor must comply with the requirements in relation to Third Party/Vendor Assessment conducted by the Bank.		
9. DOCUMENTATION			
9.1. Configuration, Operation, and Deliverables	9.1.a. The winning bidder must provide documentation on the integrated system configuration, which includes but not limited to capacity and performance base lining, zoning and connectivity diagrams of attached hosts to storage—these documentation will serve as additional inputs during health checks, problem determination and issue resolution.		
	9.1.b. The winning bidder must provide documentation on every deliverable specified in this document to record completion.		
	9.1.c. The winning bidder must provide documentation on the integrated system operations and must be written in English of durable construction with concise and high quality presentation to include but not limited to the following: <ol style="list-style-type: none"> 1. User Manuals 2. Technical / Reference Manuals 3. System / Operation Manuals Troubleshooting and Installation Guides		

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CAPABILITY	REQUIREMENT	WILL COMPLY? YES/NO	REMARKS
9.2. Media and Format	9.2.a. All documentation must be in hard and soft copies; Soft copies must be stored either on a compact disk and USB drive; Soft copy documentation must be in a non-editable format.		
	9.2.b. All software used for the implementation of the integrated system must be provided with installation media.		
9.3. Ownership	9.3.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

Noted/Approved by:


JOSIE M. CASTRO
Acting Head, DCMD

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