Section 6: Schedule of Supply

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| 1. List of Goods and Related Services |

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| --- | --- | --- | --- | --- |
| Item No. | Name of Goods or Related Services | Description | Unit of Measurement | Quantity |
| 1 | Procurement of a 30 kva UPS | Procurement of a 30 kva UPS | Nos | 1 |
| 2 | Supply and installation of a new server | Supply and installation of a new server | Nos | 1 |

1. Delivery and Completion Schedule

Delivery shall take place in compliance with the dates, duration, and locations indicated below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item No. | Description  of Goods  or  Related Services | Delivery Schedule  (Duration) | Location | Required Arrival Date of Goods or  Completion Date for Related Services |
| 1 | Supply and installation of a new server | 120 days | Male’, Rep. of Maldives | August 2024 |
| 2 | Procurement of a 30 kva UPS | 120 days | Male’, Rep. of Maldives | August 2024 |

1. Technical Specifications
2. **TECHNICAL REQUIREMENT AND SCOPE OF WORKS OF SERVER**

|  |  |  |
| --- | --- | --- |
| # | Requirements | Compliance  (Yes / No) |
| **1** |  |  |
|  | Country of Origin: *(please specify)* |  |
|  | Platform:   1. Offered storage shall be a next generation storage platform which shall offer the functionality of both Converged as well as Hyper-converge with independent scaling of both Storage and Compute without any downtime.   Offered Platform shall have complete independence for the scaling of both Compute and Storage platform. Scaling of both components shall be completely independent without any immediate disk re-balancing operation. |  |
|  | Hypervisor Support: Offered platform shall provide the simplicity of Hyper-converge from a well-known Hypervisor like VMware / Microsoft Platform along with required licenses as per below specifications and requirements. |  |
|  | Capacity & Scalability:   1. Offered Platform shall be supplied with at-least four (04) number of Compute node/engines in single cluster, along with 46TB all flash capacity using 1.92 NVMe SSD drives on storage layer. 2. Each compute engine shall have flexibility to see and consume the entire capacity of storage layer. 3. 04 Numbers x Compute node / engine and each shall have the following minimum configuration.  * 2 x Intel Xeon-Silver 4316 2.3GHz 20-core Processor * 8 x 32GB (1x32GB) Dual Rank DDR4-3200 Registered Memory * 1 x NVMe PCIe3 x8 OS Boot Device * 2 x Ethernet 10/25Gb Dual port SFP28 Adapter * 2 x 1600W Platinum Hot Plug Low Halogen Power Supply * 1 x Enterprise Server Remote Management License * 1 x Server Rail Kit  1. 2 x Intel Xeon-Silver 4316 2.3GHz 20-core Processor for node upgrades 2. Offered platform shall also be supplied with additional dedicated 64GB cache / memory for read and write operations on each node of storage layer. |  |
|  | Management:   1. Complete platform shall be managed directly from offered hypervisor management layer and shall not require multiple management tools for day to day operations. 2. Each compute engine shall have additional network port for remote management. |  |
|  | Data Protection:   1. Offered platform shall use all NVMe flash drives only for storage layer. All offered NVMe Flash drives on storage layer shall be configured with Hardware raid with at-least any three drive failure simultaneously or in Replication factor 3 (RF-3) for asked usable capacity, if hardware raid is not supported by the bidder. 2. Failure of any compute engine shall not reduce the overall number of offered drives. In case vendor is not supporting this capability, then additional one node of the same configuration in terms of compute and storage shall be provided. |  |
|  | Performance:   1. Offered platform shall have flexibility to utilize all offered drives on storage layer for a given virtual machines for both read and write operations and shall not be limited to local node allocation. 2. There shall be no performance de-gradation during critical support activities like Firmware upgrade, patch upgrade etc. |  |
|  | No Single point of Failure:   1. Offered platform shall be configured in no single point of failure-environment. Vendor shall design in such a way that storage layer shall provide at-least 6 nines data availability and VM availability is being maintained through the offered hypervisor clustering. 2. There shall be no performance de-gradation on storage layer due to a single component or storage node failure. |  |
|  | Cloud Enabled Monitoring, AI support and Analytics:   1. Offered platform shall have cloud enabled monitoring, AI support and analytics engine for proactive management and risk mitigation. All required licenses for same shall be included in the offer. 2. Providing Firmware upgrade and patch upgrade recommendations proactively and with awareness of the peripheral infrastructure connected to the platform. 3. Automatically prevent installation of firmware that may clash with other infrastructure pieces connected to the storage layer. 4. Providing extremely granular historical capacity and performance trend analysis by default, without the need to enable extra logging, install any appliances (physical or virtual), or install any software. 5. Shall provide history of support cases logged with Support team with operational efficiencies. 6. Provide automated upgrade recommendations for both software and hardware. 7. Shall be tightly integrated with Hypervisor layer and shall be certified to work with at-least VMware. 8. Hypervisor integration shall be able to provide end to end monitoring of hypervisor Datacenter, Data-store, Hypervisor Host and VMs running within the hypervisor datacenter and shall be able to link with offered storage layer. 9. Shall provide the detailed analysis of CPU Contention, Memory contention, IO contention for each VM. 10. Shall have capability to identify the top VMs which are contributing towards maximum IOs and Latency. 11. In case vendor does not support the above offered functionality then Vendor shall supply the enterprise license for VMware vRealize suite for entire configuration. |  |
|  | Thin Provisioning and Space optimization:   1. Offered platform shall support critical global data efficiency features - inline de-duplication, inline compression and thin provisioning without any performance degradation 2. All above data efficiency features shall be truly global and shall have capability to compare chunks across all VMs and datastores enabled / created into the platform. 3. Offered platform shall support both non-duplicated datastores as well as duplicated datastores at the same time within the platform. 4. Offered Platform shall support both non-compressed as well as compressed datastores at the same time within the platform. |  |
|  | Snapshot / Point in time copy / Zero Copy Clone / Thin Clone:   1. Offered platform shall support more than 1000 Snapshots for a given datastore. 2. All created snapshots shall support global de-duplication and compression. 3. Offered platform must support multiple Snapshots or Clones or Replications sessions without any impact to performance. |  |
|  | Remote Replication:   1. Offered platform shall support Stretch cluster across locations while ensuring that dual write is being maintained at each location. Replication across locations shall be native inside the platform. 2. Offered Platform shall have ability to replicate only incremental changes between two sites (Primary and Secondary). |  |
|  | Licenses:   1. Vendor shall provide the license for all critical functionalities like capacity expansion, Snapshot, Thin Clone, Replication and QOS etc. for the maximum supported capacity of platform. There shall be no additional software license requirement for future capacity upgrade. Any additional license required for meeting the RFP specification shall also be offered upfront. 2. Shall include the following Hypervisor Licenses  * 06 Nos x VMware vSphere 8 Standard with 1 Year Production Support/Subscription * 06 Nos x VMware vCenter Server 8 Standard with 1 Year Production Support/Subscription |  |
|  | Warranty and Support:   * Coverage: 3-Year hardware and software support * 1-hour response 24x7 for severity 1 incidents * Direct connect to product specialist * 24x7 4-hour on-site attendance for hardware repair * 24x7 access to online self-serve and self-solve capabilities, 24x7 incident logging * Remote Problem Diagnosis: Technical support assistance for problem diagnosis * Proactive Notification: Alerts and notifications for important product updates and issues * Software Update Access: Access to software updates and patches * 3-Year Local Technical Support by OEM certified engineers |  |
| **2** | **Supply Installation, Configuration, and Integration for Backup Infrastructure Upgrades** |  |
|  | Industry Leadership   1. The offered scale out storage solution shall be a scale-out software defined storage being with required compute, network, and storage hardware. 2. Software defined scale-out storage vendor shall be listed in Gartner’s in 2020-2021 Magic Quadrant for Distributed File Systems and Object Storage as a leader. |  |
|  | Software Defined  1. Offered Scale out Storage solution shall be true Scale-out software defined storage with following features:   * Shall be able to port and configure on standard x86 servers * Shall have flexible OS support with Linux distributions. * There shall be no need to maintain or qualify hardware compatibility list needed except for the resource requirement for Compute, Storage, and network. * The offered product shall be software only product only. * Object storage should be based on micro-services architecture supporting Kubernetes * Solution must support replication between DCs * Object storage must support S3 Bucket Lifecycle Expiration & Data Transition * Object storage must support Prometheus application for event monitoring and alerting * Object storage must support Object Lock & SOBR offload for backup solution proposed. |  |
|  | Core Technology   1. The offered Object storage core technology shall be able to abstract the underlying servers, to create a uniformly scalable storage pool. 2. There shall be No size limit for object or files which can be stored in the cluster. 3. Offered storage shall do automatic Rebalancing when adding a new server in the cluster. 4. Offered storage shall allow capacity extensions done by adding disks to existing servers (scale-up) or adding additional servers to the system (scale-out). 5. Object storage must support erasure coding 2+1 & 9+1 schemas to protect data. 6. Object storage must support IAM Policy configuration. 7. Object storage must integration with Authentication Infrastructure (SAMLv2, OIDC and LDAP) 8. Object storage must have SSD & HDD to provide best performance with cost-effective price |  |
|  | Availability, Reliability & Durability   1. The solution must provide a minimum of eight 9 durability on a Single Site and shall have capability to provide 11 nines on multiple Site. 2. Offered solution shall be completely redundant and there shall be no single point of failure. |  |
|  | Data Protection   1. Offered storage shall support both replication & Erasure coding. 2. Offered software defined storage shall be able to expand the given cluster using both Replication factor and Erasure coding technique. |  |
|  | Connectivity - Object interface   1. Object interface would be scalable S3. Its architecture shall include the following:   o S3-Server: S3 API Server for Buckets/Objects, MPU and more  o Scale-Out "any-to-any" access  o Security model S3-Vault: Security service for Accounts             a. Multi-tenant, Support for S3 IAM – Identity and Access Management.             b. Authentication with Signature v2 and v4             c. Microsoft Active Directory over SAML 2.0 (ADFS) Integration             d. Comprehensive AWS IAM security model for Users & Groups with Roles             e. Bucket & Object ACLs  o S3-Metadata: Distributed Metadata Engine  o S3 Bucket Versioning  o S3 Object Lock  o Transparent Bucket-Level At-REST Encryption  o S3 Console: GUI Web interface to manage accounts, users, policy and monitor usage.  o S3 Browser: GUI Web interface to create buckets and upload objects.  o Quota for S3. |  |
|  | Data Management Features   1. It shall be possible to tag and search S3 Metadata. 2. Lifecycle Management - It shall be possible to automatically transition, and expiration of data based on criteria. 3. It shall be possible to asynchronously replicate bucket to several Cloud targets. 4. Offered storage shall support multi-tenancy and data isolation |  |
|  | Simplifying operations and management   1. Offered storage shall have Simplified Operations & Management and shall provide:   • Software Upgrades, Server replacements, or Capacity Extensions don’t stop the system  • Automated disk failure detection  • Automatically rebuild for failed drive  • Automated storage rebalancing  • Disk replacement utility  • Easily add servers or hard drives in the server  • The system shall automatically rebuild the missing data in case of a hardware component failure. |  |
|  | Multi-cloud Controller   1. Offered storage shall have in-built multi-cloud controller engine and shall provide the following features:   • Shall Support writing data to any Cloud (Amazon S3, Google Cloud Storage, Microsoft Azure) via a single S3 API.  • Shall have Open-Source interface allows developers to quickly test compatibility.  • Shall Preserves native format of the data on any Cloud for providing the ability to read data directly on the public Clouds.  • Shall support Replicating one to many asynchronously so that a given bucket can be replicated to several private and public Cloud targets.  • Shall support Lifecycle data to any Cloud for automatic transition and expiration of data based on criteria.  • Shall have GUI Web interface to manage multi-cloud environment.   1. In case vendor doesn't support above features natively then vendor shall provision the complete cloud automation suite in their bid and shall provide the complete documentation in the bid. |  |
|  | Compliance   1. The offered storage shall ensure that Data must be tamper-proof. 2. Data cannot be deleted which means offered storage shall provide object lock capability. 3. Data must be kept for a specified period which means offered storage shall provide retention mechanism. 4. Offered storage shall have capability to migrate the data to an alternative media |  |
|  | Hardware Specification   1. Offered Platform shall be a dense platform supporting at-least 24 x Large Form factor drives 2. Processor: Minimum 2 number (s) of latest generation Intel 16 Cores processors 3. Each Node shall have minimum of 24 x DIMM slots and shall be scalable upto 3TB memory 4. Memory: Shall be supplied with minimum of 256 GB DDR4 memory. 5. The Server shall support 24 x LFF drives. 6. The server shall also support an additional 8 number of additional SAS / SATA / NVMe SSD drives. 7. Network: The server shall be supplied with at-least dual port 10/25Gb SFP+ adapters. All transceivers and cables should be included. 8. Capacity Disk: The server shall be supplied with 12 numbers x 8TB SAS 12G Business Critical 7.2K LFF 512e HDD 9. Cache Disk: The server shall be supplied with 2 numbers x 1.92TB NVMe High Performance RI SFF U.3 SSD 10. Boot Disk: Capacity Disk: The server shall be supplied with 2 numbers x 480GB M.2 SSDs PCIe3 x8 Boot Device 11. RAID Controller: The node shall have minimum 1 numbers hardware raid controller (16 Internal Lanes, 4GB Cache, 12G SAS interface) 12. Enterprise server remote management software licenses shall be included. 13. The server shall include standard rack mounting kits. 14. Server should support below networking cards:   • 1Gb 4-port network adaptors  • 10Gb 2-port Ethernet adaptor  • 10/25Gb 4-port Ethernet adaptor  • 100Gb 2- port network adaptor  • 200Gb single port network adaptor |  |
|  | System Security   1. UEFI Secure Boot and Secure Start support 2. Immutable Silicon Root of Trust 3. FIPS 140-2 validation 4. Tamper-free updates - components digitally signed and verified 5. Secure Recovery - recover critical firmware to known good state on detection of compromised FW 6. Ability to rollback firmware 7. Secure erase of NAND 8. System should support Encryption of the data (Data at rest) for internal storage using encryption keys. |  |
|  | Veeam Backup Software   1. Software Compatibility:  * Operating Systems: Compatible with major operating systems, including Windows Server, Linux distributions, and Mac OS. * Virtualization Platforms: Supports popular virtualization platforms such as VMware vSphere, Microsoft Hyper-V, and Nutanix AHV. * Cloud Platforms: Integration with leading cloud platforms like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).  1. Backup and Replication Features:  * Agentless Backup: Capable of performing agentless backups of virtual and physical environments. * Full and Incremental Backups: Supports both full and incremental backup methods to optimize storage and network utilization. * Application-Aware Backups: Provides application-aware backups for common enterprise applications, including Microsoft Exchange, SQL Server, SharePoint, and Active Directory. * Granular Recovery: Allows granular file-level and item-level recovery options for quick restoration of specific data. * WAN Acceleration: Utilizes WAN acceleration technology to optimize backup and replication processes over wide-area networks, ensuring efficient offsite data storage and replication. * Storage Integration: Offers integration with leading storage systems to leverage advanced storage capabilities and enhance performance. * Disaster Recovery: Supports disaster recovery scenarios with failover and failback operations for rapid recovery of critical systems. * Monitoring and Reporting: Provides comprehensive monitoring and reporting capabilities to track backup and replication activities, performance metrics, and storage usage. * Data Security: Ensures secure transmission and storage of backup data through encryption mechanisms, including SSL/TLS.  1. Support and Maintenance:  * Subscription Duration: 1-year subscription for 20 VMs or instances * Support Availability: 24x7 support with access to technical assistance via phone, email, or web portal. * Software Updates: Includes software updates, bug fixes, and patches to ensure the latest functionality and security. |  |
|  | Warranty   1. Should have Access to 3 years 24x7 Manufacturer's Customer Service and Support over the phone/remote TAC for troubleshooting assistance of Product. 2. Hardware Warranty shall include 3-Year Parts, Labor & Onsite support with 24\*7 4 Hours response. |  |
|  | **Installation, Configuration, Migration and Training Service**  Overview  The project involves implementing a next-generation storage platform with converged and hyper-converged functionality, allowing independent scaling of both storage and compute components. The platform will be integrated with existing infrastructure, including HPE MSA SAN Storage and HPE Bladesystem c7000. The desired vendor MUST have at minimum the following full time OEM Certified Professional/Engineer under its payroll to provide all required professional services. All relevant engineer(s) certificates and supporting documents shall be included with the proposal. The engineer(s) shall be available onsite for the duration of the service.   * VMware Certified * Microsoft Certified * Offered Server’s OEM Certified * Offered Storage OEM Certified (Storage solutions)   Design and Planning:   * Review the requirements and technical specifications provided. * Design a solution architecture that meets the specified criteria, including the converged and hyper-converged functionality, independent scaling of storage and compute environment. * Plan the implementation process, including hardware and software configurations, network connectivity, and integration with the hypervisor layer. * Plan the integration and workload segregation process.   Installation and Configuration:   * Deploy and install the storage platform, including the offered storage, compute nodes, and core network switches. * Configure the storage platform to ensure independence for scaling of both compute and storage components. * Set up the hypervisor layer, including the installation of VMware vSphere and vCenter Server. * Connect and configure the network ports, ensuring proper connectivity and remote management capabilities. * Configure the offered platform to support thin provisioning, space optimization, and global data efficiency features such as deduplication, compression, and thin cloning.   Integration and Testing:   * Integrate the storage platform with the hypervisor management layer for centralized management and monitoring. * Verify the no single point of failure configuration, testing data availability, and VM availability through hypervisor clustering. * Integrate the cloud-enabled monitoring, AI support, and analytics engine.   Data Protection and Replication:   * Configure the storage layer to use NVMe flash drives with hardware RAID for data protection. * Set up snapshot capabilities, global deduplication and compression.   Integration of Existing HPE MSA SAN Storage and Existing PE Bladesystem c7000:   * Assess the current configuration and connectivity of the existing HPE MSA SAN Storage and HPE Bladesystem c7000. * Develop a detailed integration plan to connect the existing infrastructure with the offered storage platform. * Migrate critical production data and virtual machines from the HPE MSA SAN Storage to the new storage platform, ensuring data integrity and minimal downtime. * Configure the connectivity between the new storage platform and the existing HPE Bladesystem c7000, ensuring compatibility and optimal performance.   Backup Infrastructure Configurations:   * Review the specifications of the Site to ensure they meet the minimum requirements for installation. * Conduct a site visit to evaluate the readiness of the installation location. * Assess power and cooling requirements to ensure they meet the needs of the servers. * Collaborate with the client's IT team to schedule the installation service at a mutually convenient time. * Unpack and inspect servers and associated components. * Install any additional hardware components, such as hard drives or network cards, if required. * Mount the servers in the designated racks or cabinets, ensuring proper grounding and cable management. * Install the scale out storage software on the servers according to the recommended installation procedure. * Install, configure and integrate Veeam backup software with the storage. * Configure data backup, replication and retention policies as per client requirement. * Configure the necessary network settings, including IP addresses and hostnames, to ensure proper connectivity. * Perform initial system checks to verify the successful installation of the software. * Integrate the solution with the client's existing infrastructure, including authentication systems and network services. * Conduct user acceptance tests to ensure the system meets the requirement.   Knowledge Transfer and Documentation:   * Provide knowledge transfer sessions to the IT team, covering the configuration, management, and monitoring of the implemented solution. * Document the implemented solution, including the configuration details, network diagrams, and any customized settings. * Provide user manuals or guides for day-to-day operations and troubleshooting.   Support and Maintenance:   * Provide on the job training on the support and maintenance processes for the implemented solution. * Coordinate with OEM support services to ensure seamless support and timely resolution of issues. * Assist with firmware upgrades, patch upgrades, and provide recommendations for software and hardware upgrades. |  |

**Team Composition for Technical Support:**

It is mandatory that the vendor maintain the required technical team as deemed as suited based on the requirements and milestones. However, the client expects that the proposer would have allocated the following more team compositions having specific skill sets and professional experience. Importantly it is expected that the vendor will maintain necessary resources for on-site technical support during crucial stages of the project that requires closer interaction with the client during installation, configuration, integration, training, testing, etc. The bidder **MUST** have full time Vendor Certified Professional/Engineer under its payroll.

**The bidder shall submit the following documents:**

* Certifications copy of the relevant training
* ID card or Passport Copy of the engineer

1. **UPS (Data Center Converged solution)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | |  | |
| Requirements | | | Compliance  (Yes / No) |
| Country of Origin: *(please specify)* | | |  |
| **Configured UPS capacity** | 30kVA (modular - upgradable to over 700 kVA) | |  |
| **Type** | * Integrated with PDU, monitoring, UPS, and power distribution in a rack system. * Wide Guide rail X 2 Unit * Rechargeable Battery, VRLA Battery, 12V, 100Ah, 12V Monobloc, 331mm(W) \* 174mm(D) \* 222mm(H), 1 PCS, UPS Battery X 32 Unit | |  |
| **monitoring** | SMS notification, Web portal access, App on phone | |  |
| **Sensors included in solution cabinets** | Smoke sensor, temperature and humidity sensor, water immersion sensor | |  |
| **Other** | In rack Air conditioning accessories - precision air conditioning installation accessories.  Wind Scooper units. | |  |
| - must be a modular Uninterruptible Power Supply (UPS) designed for small data centers.  - Must support online maintenance through hot swap switches  - Installation and provisioning to be done by the vendor  - Real-time monitoring should be available  - Intelligent battery monitoring should be available | | |  |

* Supplier must provision and test the solution.
* UAT must be obtained from the Ministry of Health after installing the system and testing.
* Minimum number of racks must be used (should have minimum 2 IT rack integrated – 600mm(W)\*1350mm(D)\*2000mm(H),42U, with glass front door. Full-height rPDU mounting plate)
* Supplier must be Manufacturer authorized distributor in Maldives (Documents must be provided).