Kerkesat per Storage – 1 Cope

No	Requirements	Functionality
1	Operating System & Clustering Support	1. The storage array should support industry-leading Operating System platforms including: Windows 2016 / 2019, HPE-UX, VMware and Linux. 2. Offered Storage Shall support all above operating systems in Clustering.
2	Capacity & Scalability	1. The Storage Array shall be offered with 6 x 1.92TB SAS SSD Drives and 6 x 2.4TB 10K rpm Drives 2. For effective power saving, Storage subsystem shall be supplied with 2.5" Small form factor SFF drives however storage subsystem shall also support LFF drives with the addition of required disk enclosures. 3. Storage shall be scalable to minimum of 240 number of SAS SFF drives.
3	Front-end Ports & Back-end Ports	1. Offered Storage system shall be supplied with 4 * 16 Gbps FC ports per controller 2. Offered storage system shall support 12G SAS Back-end connectivity.
4	Architecture	The storage array should support dual, redundant, hot-pluggable, active-active array controllers for high performance and reliability
5	No Single point of Failure	Offered Storage Array shall be configurable in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.
6	Disk Drive Support	1. Storage system shall also support maximum of Enterprise SAS spinning drives, SSD and near line SAS / 7.2K RPM drives. 2. Offered storage array shall also have support for self-encrypted SSD, SAS and near line SAS / 7.2K RPM .
7	Cache	1. offered Storage Array shall be given with Minimum of 12GB cache per controller in a single unit. 2. Cache shall be backed up in case of power failure for indefinite time either using batteries or capacitors or any other equivalent technology. 3. Offered Storage shall also have optional support for Flash cache using SSD / Flash drives. Offered storage shall support at-least 8TB Flash Cache. 4. Offered Flash cache shall be tuned for random read operations and shall remain activated even at less than 70% of random average read workload.

8	Raid Support	1. Offered Storage Subsystem shall support Raid 1 , 5 and Raid 6 2. All Raid Sets shall support thin provisioning. Vendor shall offer the license of thin provisioning for complete supported capacity of the array. 3. Thin provisioning shall be supported with offered Flash Cache. 4. Raid processing shall be offloaded to dedicated ASIC instead of CPU. In case vendor is not supporting it then vendor shall ensure that additional 12GB cache per controller is configured to offset the raid processing workload.
9	Point in time and clone copy	1. Offered Storage array shall be configured with array based Snapshot and clone functionality and shall be configured for minimum of 512 snapshot licenses. 2. Offered Storage array shall support at-least 512 point in time copies (Snapshots) and 128 volume / Clone copies
10	Replication	Offered storage subsystem shall support storage based replication to DR location. License for maximum supported capacity of the array shall be offered.
11	Virtualization and Thin provisioning	1. Offered storage shall be offered and configured with virtualization capability so that a given volume can be striped across all spindles of given drive type within a given disk pool. Disk pool shall support all listed raid sets of Raid 1, Raid 5 and Raid 6. 2. Offered Storage shall be offered and configured with Thin Provisioning capability.
12	Data Tiering	Offered Storage shall also be configured for Sub-Lun Data tiering in real time fashion across different type of drives within a given pool like SSD, SAS, NL-SAS etc. License shall be configured for maximum supported capacity of the array.
13	Global and dedicated Hot Spare	1. Offered Storage Array shall support Global hot Spare for offered Disk drives. 2. At least 2 Global hot spare drive shall be configured for every 30 drives. 3. Offered storage array shall have the support for distributed hot spare
14	Logical Volume & Performance	1. Storage Subsystem shall support minimum of 512 Logical Units. Storage Array shall also support creation of more than 100TB volume at controller level. 2. Offered Storage shall have inbuilt performance management software. Configuration Dashboard shall show overall IOPS and MB/sec performance.
15	Load Balancing & Multi-path	1. Multi-path and load balancing software shall be provided, if vendor does not support MPIO functionality of Operating system.

16	Performance	Offered storage shall have listed benchmark for performance of at-least 275,000 in Raid 5 using appropriate drives. Vendor shall provide documentary proof for it.
17	Array Integration	Offered storage array shall have plug-in for VMware VCenter, Microsoft System center as well as vStorage APIs (VAAI) for array integration.
18	Warranty	Equipment must be offered Brand New and must be offered with 3 Years Warranty
19	Implementation	Must be implemented according to the requirements from AFK
20	Authorization	Bidding company must offer MAF – Manufacturer Authorization Form for this exact project, which shows that the company is authorized from the vendor to offer for this specific project

Kerkesat per Server – 2 Cope

Requirements	Functionalities
Chassis	Must be maximum 1U Rack Mountable to save space
CPU	Must be offered with 2 x Intel Xeon Silver 4216 Processors
Memory	Must support 24DIMM slots. Scalable up to 3.0 TB using DDR4 Load Reduced DIMM (LRDIMM) operating at 2933/2666 MHz (depending on processor model) or Scalable up to 1.5TB using DDR4 Registered DIMM (RDIMM) operating at 2933/2666 MHz (depending on processor model) or System should support persistent memory up to 6TB (12* 512 GB HPE Persistent Memory @ 2666 MT/s) Should be capable of identifying and reporting whether genuine OEM memory is installed for system reliability Must be offered with 256GB RAM Memory (8 x 32GB RAM)
Memory Protection	Advanced ECC with multi-bit error protection, Online spare, mirrored memory and fast fault tolerance
HDD Bays	Must support minimum Up to 8 HDD Slots The drive carrier should have intuitive icon based display along with "DO NOT REMOVE" caution indicator that gets activated automatically in order to avoid data loss/downtime due to wrong drive removal.
Hard disk drive	Must be offered with 2 x 480GB SSD Drives for Operating System (VMWare Hypervisor) in RAID1
Controller	Server should support Onboard SATA software RAID controller supporting SSD/HDD and at least two M.2 drives In addition, server should support one of the below controllers supporting Mixed Mode which combines RAID and HBA mode, PCIe 3.0 based 12Gb/s SAS Raid Controller with RAID 0/1/1+0/5/50/6/60/1 Advanced Data Mirroring/10 Advanced Data Mirroring (onboard or on a PCI Express slot) or PCIe 3.0 based 12Gb/s SAS Raid Controller with RAID 0/1/1+0/5/50/6/60/1 Advanced Data Mirroring/10 Advanced Data Mirroring with 4GB battery backed write cache (onboard or on a PCI Express slot) Storage controller should support Secure encryption/data at rest Encryption Must be offered with P408i SR Controller with 2GB Cache.
Networking features	Server should support below networking cards: 1. 1Gb 4-port network adaptors 2. 10Gb 2-port Ethernet adaptor 3. 10GBaseT 4-port Ethernet adaptor 4. 4x25Gb Ethernet adaptor 5. 10/25Gb 2-port Ethernet adaptor 6. 100Gb Ethernet Infiniband Options: 40Gb dual port or 100Gb Single or Dual port Adapter 100Gb Single port Omni path adaptor Must be offered with: 4 x 10/100/1000 Mbps ports 2 x 16Gb Fiber channel Ports (1 x SN1100Q 16Gb 2p FC HBA card)
Interfaces	Serial - 1 Micro SD slot - 1 USB 3.0 support With Up to 5 total: 1 front, 2 internal, 2 rear, 2 internal (secure)

Bus Slots	Three PCI-Express 3.0 slots, at least two x16 PCIe slots
Power Supply	Should support hot plug redundant low halogen power supplies with minimum 94% efficiency Must be offered with redundant PS with maximum 500W
Fans	Redundant hot-plug system fans
Industry Standard Compliance	ACPI 6.1 Compliant PCIe 3.0 Compliant PXE Support Energy Star ASHRAE A3/A4 UEFI 2.6 SMBIOS Redfish API SNMP v3 TLS 1.2 DMTF Systems Management Architecture
System Security	UEFI Secure Boot and Secure Start support Security feature to ensure servers do not execute compromised firmware code FIPS 140-2 validation Support for Commercial National Security Algorithms (CNSA) Common Criteria certification Configurable for PCI DSS compliance Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser Tamper-free updates - components digitally signed and verified Secure Recovery - recover critical firmware to known good state on detection of compromised firmware Ability to rollback firmware Secure erase of NAND/User data TPM (Trusted Platform Module) 1.2 TPM (Trusted Platform Module) 2.0 Smart card (PIV/CAC) and Kerberos based 2-factor Authentication Configurable for PCI DSS compliance Chassis Intrusion detection
Operating Systems and Virtualization Software Support	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) VMware Clear OS
GPU support	System should support NVIDIA's latest computational accelerators and graphics accelerators
System tuning for performance	1. System should support feature for improved workload throughput for applications sensitive to frequency fluctuations. This feature should allow processor operations in turbo mode "ON" without the frequency fluctuations associated with running in turbo mode 2. System should support workload Profiles for simple performance optimization
Secure encryption	System should support Encryption of the data (Data at rest) on both the internal storage and cache module of the array controllers using encryption keys. Should support local key management for single server and remote key management for central management for enterprise-wide data encryption deployment.
Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response.

Provisioning	1. Should support tool to provision server using RESTful API to discover and deploy servers at scale 2, Provision one to many servers using own scripts to discover and deploy with Scripting Tool (STK) for Windows and Linux or Scripting Tools for Windows PowerShell
Firmware security	1. For firmware security, system should support remote management chip creating a fingerprint in the silicon, preventing servers from booting up unless the firmware matches the fingerprint. This feature should be immutable 2. Should maintain repository for firmware and drivers recipes to aid rollback or patching of compromised firmware. Should also store Factory Recovery recipe preloaded to rollback to factory tested secured firmware
Embedded Remote Management and firmware security	1. System remote management should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication 2. Server should have dedicated 1Gbps remote management port 3. Remote management port should have storage space earmarked to be used as a repository for firmware, drivers and software components. The components can be organized in to install sets and can be used to rollback/patch faulty firmware 3. Server should support agentless management using the out-of-band remote management port 4. The server should support monitoring and recording changes in the server hardware and system configuration. It assists in diagnosing problems and delivering rapid resolution when system failures occur 5. Applications to access the server remotely using popular handheld devices based on Android or Apple IOS should be available 6. Remote console sharing up to 6 users simultaneously during pre-OS and OS runtime operation, Console replay - Console Replay captures and stores for replay the console video during a server's last major fault or boot sequence. Microsoft Terminal Services Integration, 128 bit SSL encryption and Secure Shell Version 2 support. Should provide support for AES and 3DES on browser. Should provide remote firmware update functionality. Should provide support for Java free graphical remote console. 7. Should support managing multiple servers as one via Group Power Control Group Power Capping Group Firmware Update Group Configuration Group Virtual Media and Encrypted Virtual Media Group License Activation 8. Should support RESTful API integration 9. System should support embedded remote support to transmit hardware events directly to OEM or an authorized partner for automated phone home support
Server Management	Software should support dashboard view to quickly scan the managed resources to assess the overall health of the data center. It should provide an at-a-glance visual health summary of the resources user is authorized to view.
	The Dashboard minimum should display a health summary of the following: • Server Profiles • Server Hardware • Appliance alerts
	The Systems Management software should provide Role-based access control

	Management software should support integration with popular virtualization platform management software like vCenter, and SCVMM
	Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory and HDD.
	Should provide an online portal that can be accessible from anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a Personalized dashboard to monitor device heath, hardware events, contract and warranty status. Should provide a visual status of individual devices and device groups. The Portal should be available on premise (at our location - console based) or off premise (in the cloud).
	Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/firmware components.
	The Server Management Software should be of the same brand as of the server supplier.
Monitoring, Analytics, and Performance	Should have continuous, proactive health monitoring and recording of required system parameters as well as diagnostic telemetry data on a 24x7 basis.
	Should have monitoring & analytics feature for the offered server/chassis along with its sub-components to predict, prevent, and auto-resolve problems and by providing automating case creation and log file submission for the problems that can't be auto resolved.
	Should help simplify the infrastructure management plan by predicting capacity, performance and bandwidth needs.
Cables	Must be offered with minimum 1m Fiber Cable for 2 Fiber Ports OM3 at least.
Licenses	Must be offered with VMWare vSphere Standard license for all CPU-s offered. Must be offered with VMWare vCenter licenses for two sites.
Warranty	Equipment must be offered Brand New and must be offered with 3 Years Warranty
Implementation	Must be implemented according to the requirements from AFK
Authorization	Bidding company must offer MAF – Manufacturer Authorization Form for this exact project, which shows that the company is authorized from the vendor to offer for this specific project