Corrigendum-1

Date: 04.09.2015

This is in reference to NPCI's RFP/2015-16/IT/012 dated 27.08.2015 for Supply, Installation & Maintenance of Servers & Storage. The prospective bidders may please note that:

The below additional servers and storage is added in the aforesaid RFP.

Section 3 – Scope of Work

3.1 Additional Scope of work:

The scope of the work is supply, install and provide onsite support of servers during the warranty period of 3 years from the date of acceptance of the systems. These servers would be deployed at Hyderabad, and Chennai Data Centre of NPCI. The same can be extended to other geographical locations where NPCI is present. Bidders should provide comprehensive onsite 24/7 AMC support for 2 years after expire of warranty with response and resolution time of 4 hours. NPCI will procure Windows server Operating Licenses and SQL separately, but the bidder is required to quote for installation of the Operating System and SQL Software.

NPCI reserves the right to place repeat Purchase order to the successful bidder for any further requirement of servers at the agreed unit rate i.e. the rate contract for a period of twelve months from the date of acceptance of the first Purchase Order.

Section 9 - Technical Specifications

Location wise details are as under:

SN	DESCRIPITION	QTY	
1	BLADE CHASSIS	3	CHENNAI (PR SITE)
2	BLADE SERVERS	17	
3	SAN	1	
4	BLADE CHASSIS	2	HYDERABAD (DR SITE)
5	BLADE SERVERS	13	
6	SAN	1	

Technical Specification of additional Servers and Storage is as under

Additional servers and storage specification -PR Site

A) Blade Chassis

A)	Blade Chassis	
	Chassis – Qty-3	
SN	Component	Requirement Specification
1	Make/Model	(Specify)
2	Base Chassis	Chassis should be able to support at least 14 Blade servers or More
		Same enclosure should support Latest generation of Intel or AMD Blade servers. Vendor should have models on the same
		Same enclosure should support 2 and 4 Processor based blade servers of latest generation of Intel or AMD processor
		The maximum height of the Chassis should be 10U
		Should support Hot Pluggable & Redundant chassis Management Modules
		Blade Chassis should have a dual/single active/passive midplane OR dual active midplane where the blades and other subsystems get plugged on and provide high availability and performance.
		Support simultaneous remote access for different servers in the enclosure.
		Should support stacking of up to 9 chassis
3	Interconnect support	Should support simultaneous housing of Ethernet (1GbE and 40 GbE), FC, iSCSI, IB interconnect fabrics, offering Hot Pluggable & Redundancy as a feature. Enclosure Should have minimum 6 Interconnect Bays (Including redundancy)
4	Blade Server Ethernet Interconnect and SAN connectivity	**For LAN Connectivity** - The enclosure should have redundant network modules with 16 X 10 GbE Downlinks (or as per the maximum capacity of the enclosure. 14 or 16 as the case may be.) and at least 8 X 10 GbE uplink ports per module, up linkable to the data center switch. The same modules should support 40GBPS without changing the switch module.
		The switch should support 1Gbps copper, 10Gbps copper RJ45, 1Gbps SX/Lx, 10Gbps SR/LR, 40Gbps SR/LR, 10G and 40G DAC cable, and 40G to 4 x 10G splitter cables.
		The switch should be scalable to support L2/L3 IPv4 and IPv6 features and functionality
		For SAN Connectivity - 16Gbps - 24 port SAN switches to be provided with 12 ports activated (8 internal + 4 External with 16 GBPS SFP Modules)
5	System Software	Management/controlling software have to be from the OEM itself.
6	Management	All required System software has to be from the OEM itself.
		Complete GUI with view of the individual blade chassis, multiple chassis in a rack, blade servers, power consumption at chassis level and blade level. Management – Comprehensive web enabled system management tool that

		monitors the system health, environment, critical action etc, With its own data engine to store status reports, alerts and error notifications.
7	Deployment & Remote Management	Complete Hardware based Remote Administration from a standard web-browser with Event logging, detailed server status, Logs, Alert Forwarding, virtual control, remote graphical console, Remote Power Control / Shutdown, Virtual Media for Remote boot and configuration, Virtual Text and Graphical Control. The blade system should have the capability of managing all the blades in the same enclosure simultaneously.

B) <u>Blade Servers</u>

B)	**Blades Servers – Qty. 3**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Half height Blade
3	Processor	2xE5-2667v3
4	Chipset	Intel C610
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives
9	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
10	FC Connectivity	2x16Gbps FC HBA per blade
11	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.

14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

C) <u>Blade Servers</u>

C)	**Blades Servers – Qty. 2**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Half height Blade
3	Processor	2xE5-2667v3
4	Chipset	Intel C610
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalents storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support

13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

D) Blade Servers

D)	**Blades Servers –Qty. 2**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Full height Blade
3	Processor	4xE5-4620v2 or higher
4	Chipset	Intel C600
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives
9	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
10	FC Connectivity	2x16Gbps FC HBA per blade
11	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
12	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters

13	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
14	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.
15	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
16	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

E) Blade Servers

E)	**Blades Servers –Qty. 4**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Full height Blade
3	Processor	4xE5-4620v2 or higher
4	Chipset	Intel C600
5	Memory	128GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x8Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters

12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for XenServer.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

F) <u>Blade Servers</u>

F)	**Blades Servers – Qty. 6**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Full height Blade
3	Processor	4xE5-4620v2 or higher
4	Chipset	Intel C600
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x8Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor

11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

L) PR SAN

L)	**SAN -Qty-1**	
Sr. No	**Component**	**Requirement**
1	Storage Architecture	The proposed storage must be a enterprise class SAN storage supporting multiple controllers/directors, offering scale-out architecture for better availability, scalability and performance; whereby processor, global cache, disk, ports can be scaled linearly by adding multiple controllers/directors. The proposed storage must be scalable to minimum four SAN controllers/directors.
		The proposed SAN storage must be a single enterprise class storage product, and not a storage solution with multiple silo/groups of dual-controller storage in a clustered configuration proposed to meet the performance and scalability requirement.
		The proposed storage array should be configured in No Single Point of failure including controller, cache, power supply and cooling fans with power cords, etc.
		The proposed storage should allow Read and Write access to all LUN's from all controllers.
		The proposed storage should allow stripping of data on drives across all controllers and not limited to drives within silo/group created by a controller pair.
2	Hardware/Software Upgrades	The proposed storage must provide non-disruptive firmware/microcode upgrade i.e. without controller/director reboot.
		The proposed storage must provide configuration changes and addition or removal of port modules etc. without controller/director reboot.

3	Ports	The proposed storage should have minimum 24 nos. of 16Gbps FC ports for host connectivity and minimum 32 nos. of 6Gbps SAS links/lanes for disk connectivity. Additional ports for replication to be included.
		The proposed storage should be scalable to 64 nos. of 16Gbps FC ports and 64 nos. of 6Gbps SAS links/lanes.
4	Cache	The proposed storage must provide dynamic cache allocation inline with the changing read/write workload.
		The proposed storage must provide protection of cache data during a power down either scheduled or unexpected power outage by battery backup for at least 72 hours OR by de-staging the data in cache to non-volatile Disk.
		The proposed storage controller should be provided with at minimum of 512GB of global cache memory.
		The proposed storage controller should be scalable to minimum 2TB cache memory or higher.
		The proposed storage should support cache coherency. In the event of a controller failure write cache of the redundant controller of the pair should not be disabled, so as not to impact application performance.
5	Disk Drive Support	The proposed storage should support SSD, SAS (10K/15K) disks and NL-SAS (7.2K) disks.
		The proposed storage should support industry standard RAID protection levels - RAID 1, RAID 5 & RAID6 on all types of disk - SSD, SAS, NL-SAS.
		The proposed storage must be scalable to minimum 1200 drives.
6	Global Hot Spare Disks	The proposed SAN storage should dedicate drives as global hot spares that can automatically be used to replace a failed drive anywhere in the storage system. Minimum of two hot spare disks should be provided for every 100 disk drives.
7	Capacity	The proposed storage must be provided with 34 TB of usable capacity using 800GB eMLC SSD with RAID5, 6 TB of usable capacity using 300GB 15K SAS drives with RAID1/0, 56 TB of usable capacity using 600GB 10K drives with RAID5. Global hot spare additional.
8	Performance	The storage should provide minimum 50,000 IOPS with a block size of 8K and 70:30 Read/Write ratio. The storage should support variable performance levels (i.e. response times) for individual applications/workloads. The storage should allow changing the performance levels for individual application at click of a button. The response times on SSD capacity must be <3ms.
9	Automated Storage Tiering	The proposed storage should natively support sub-LUN tiering to achieve improved performance and lower Total cost of Ownership. The storage should support automated movement of data between minimum three tiers of different disk and RAID types. All tiers must be read and write capable. Provide all the necessary licenses for entire offered capacity of automated storage tiering.
		Automated tiering disk groups/pools should allow configuring entire capacity of 96 TB from SSD and SAS in a single pool.
10	Storage Management	The proposed storage array must provide easy to use GUI (web based) and CLI enabled administration interface for configuration, storage management. If licensed separately, the

		vendor needs to provide all the necessary licenses for entire offered capacity.
		The storage management software should provide real-time (upto 24 hours) and historical (atleast 6 months) performance monitoring. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.
		The storage management software must provide multiple levels of access control including role-based security, provision to send alerts via email.
11	Encryption	The proposed storage to provide data encryption at rest at controller level or using self-encrypting drives without impacting storage performance. The features should be provided for all proposed disk type.
12	Data Protection	The proposed storage should ensure end-to-end (from the host all the way to disk) data integrity checking using the ANSI T10 data integrity field (DIF) standard or equivalent methods. The T10 data integrity standard or equivalent proprietary methods must be supported on all types of disks.
		The proposed storage should support proactive disk scanning and correction
13	OS Support	The proposed storage should support multiple operating systems such as Microsoft Windows 2008/2012, Linux, HP-UX, IBM-AIX, Solaris, VMware, Citrix, etc…
		The proposed storage must support host based multi-pathing feature. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.
		The storage should support clustering solutions such as Microsoft cluster, MS SQL cluster, SUN Solaris cluster, Linux cluster, Veritas cluster, HP-UX cluster, IBM AIX cluster etc…
14	Full Copy Clone	The proposed SAN storage should support full copy Clones. The storage should support incremental updates (delta re-synch) to minimum of 2 target LUN's (clones) post the initial full sync. Provide all the necessary licenses for entire offered capacity of full copy Clones creation and restore.
15	Pointer based Snapshot	The proposed SAN storage should support pointer based Snapshot. The pointer based Snapshot should be independent of each other, restoring a Snapshot to production LUN should not invalidate the rest of the Snapshot for same production LUN. The proposed storage should support minimum of 8 pointer based Snapshot copies per Source LUN. Provide all the necessary licenses for entire offered capacity for Snapshots creation and restore.
16	Remote Replication	The proposed storage solution should support both Synchronous and Asynchronous Data replication.
		The asynchronous replication in proposed solution should support incremental data update with synchronization period less than 60 seconds to achieve RPO of less than four minute. Provide all the necessary licenses for full capacity of asynchronous replication.
		Storage should allow simultaneous replication of minimum 512 LUN's.

		The replication solution must support three-way zero data loss solution with functionality to provide delta-resync capability from surviving site in case of a disaster.
		The replication solution must support features for saving WAN bandwidth using compression/reduplication or equivalent features.
		The replication solution must be provided using storage based IP ports or FCIP router or equivalent solution.
17	Quality of Service	The proposed storage should provide Quality of Service features thereby prioritizing workloads for specific applications.
18	Thin Provisioning	The proposed storage must provide Virtual/Thin provisioning for storage allocation. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.
		The proposed storage should support space reclamation feature i.e. on-the-fly zero data detection as an extension of Virtual/Thin provisioning on SAN.
19	Storage Virtualization	The proposed solution should be able to virtualize existing storage arrays at NPCI from EMC, IBM, HP, Dell, Net App for provisioning providing a single management interface and hence single point of control.
20	Uptime	The proposed storage should provide an overall uptime of 99.9%.
21	SAN Switches	Provide 2 nos. SAN switches. Each SAN switch should be with dual power supply, 24 ports of 16Gbps active ports. Include 48 nos. of OM3, LC-LC cables 20 meters.

Additional Servers and Storage Specifications-DR Site

A) Blade Chassis

M)	Chassis – Qty. 2	
SN	**Component**	**Requirement Specification**
1	Make/Model	
2	Base Chassis	Chassis should be able to support at least 14 Blade servers or More
		Same enclosure should support Latest generation of Intel or AMD Blade servers. Vendor should have models on the same
		Same enclosure should support 2 and 4 Processor based blade servers of latest generation of Intel or AMD processor
		The maximum height of the Chassis should be 10U
		Should support Hot Pluggable & Redundant chassis Management Modules
		Blade Chassis should have a dual/single active/passive midplane OR dual active midplane where the blades and other subsystems get plugged on and provide high availability and performance.
		Support simultaneous remote access for different servers in the enclosure.
		Should support stacking of up to 9 chassis
3	Interconnect support	Should support simultaneous housing of Ethernet (1GbE and 40 GbE), FC, iSCSI, IB interconnect fabrics, offering Hot Pluggable & Redundancy as a feature. Enclosure Should have minimum 6 Interconnect Bays (Including redundancy)
4	Blade Server Ethernet Interconnect and SAN connectivity	For LAN Connectivity - The enclosure should have redundant network modules with 16 X 10 GbE Downlinks (or as per the maximum capacity of the enclosure. 14 or 16 as the case may be.) and at least 8 X 10 GbE uplink ports per module, up linkable to the data center switch. The same modules should support 40GBPS without changing the switch module.
		The switch should support 1Gbps copper, 10Gbps copper RJ45, 1Gbps SX/Lx, 10Gbps SR/LR, 40Gbps SR/LR, 10G and 40G DAC cable, and 40G to 4 x 10G splitter cables.
		The switch should be scalable to support L2/L3 IPv4 and IPv6 features and functionality
		For SAN Connectivity -16 GBPS 24 port SAN switches to be provided with 12 ports activated. (8 internal + 4 External with 16 GBPS SFP Modules)
5	System Software	Management/controlling software have to be from the OEM itself.
6	Management	All required System software has to be from the OEM itself.
		Complete GUI with view of the individual blade chassis, multiple chassis in a rack, blade servers, power consumption at chassis level and blade level. Management – Comprehensive web enabled system management tool that monitors the system health, environment, critical action etc., With its own data engine to store status reports, alerts and error notifications.

7	Deployment & Remote Management	Complete Hardware based Remote Administration from a standard web-browser with Event logging, detailed server status, Logs, Alert Forwarding, virtual control, remote graphical console, Remote Power Control / Shutdown, Virtual Media for Remote boot and configuration, Virtual Text and Graphical Control. The blade system should have the capability of managing all the blades in the same enclosure simultaneously.

B) Blade Servers

N)	**Blades Servers – Qty. 3**	
SN	**Component**	**Requirement Specification**
1	Make/Model	(specify)
2	Form Factor	Half height Blade
3	Processor	2xE5-2667v3
4	Chipset	Intel C610
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
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14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.

15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

C) Blade Servers

O)	**Blades Servers – Qty. 2**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Half height Blade
3	Processor	2xE5-2667v3
4	Chipset	Intel C610
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)

		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

D) Blade Servers

P)	**Blades Servers – Qty. 1**	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Full height Blade
3	Processor	4xE5-4620v2 or higher
4	Chipset	Intel C600
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)

		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

E) Blade Servers

Q)	Blades Servers – Qty. 2	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	HP, IBM, DELL(specify)
2	Form Factor	Full height Blade
3	Processor	4xE5-4620v2 or higher
4	Chipset	Intel C600
5	Memory	128GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x8Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)

		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

F) Blade Servers

F)	Blades Servers – Qty. 3	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Full height Blade
3	Processor	4xE5-4620v2 or higher
4	Chipset	Intel C600
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.

		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

G) Blade Server

G)	Blades Servers – Qty. 1	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Full height Blade
3	Processor	2 x E5-2643(3.4Ghz, 6 core CPU)
4	Chipset	Intel C600
5	Memory	256 GB, at least 50% memory slots should be free for future expandability
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	2x800GB SAS based SSDs
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16 Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

H) Blade Server

H)	Blades Servers – Qty. 1	
SN	**Component**	**Requirement Specification (As per RFP)**
1	Make/Model	(specify)
2	Form Factor	Half height Blade
3	Processor	2 * E5-2643(3.4Ghz, 6 core CPU)
4	Chipset	Intel C610
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.
7	Internal Storage	2x800GB SAS based SSDs
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols
		Each of the network port should be capable of tailoring network connections and speeds based on application needs
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.
9	FC Connectivity	2x16Gbps FC HBA per blade
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.

I) DR SAN

I)	SAN-Qty-1 No

Sr. No	Component	Specifications
1	Storage Architecture	The proposed storage must be a enterprise class SAN storage supporting multiple controllers/directors, offering scale-out architecture for better availability, scalability and performance; whereby processor, global cache, disk, ports can be scaled linearly by adding multiple controllers/directors. The proposed storage must be scalable to minimum four SAN controllers/directors.
		The proposed SAN storage must be a single enterprise class storage product, and not a storage solution with multiple silo/groups of dual-controller storage in a clustered configuration proposed to meet the performance and scalability requirement.
		The proposed storage array should be configured in No Single Point of failure including controller, cache, power supply and cooling fans with power cords, etc.
		The proposed storage should allow Read and Write access to all LUN's from all controllers.
		The proposed storage should allow stripping of data on drives across all controllers and not limited to drives within silo/group created by a controller pair.
		The proposed storage offered should be of latest generation enterprise storage.
2	Hardware/Software Upgrades	The proposed storage must provide non-disruptive firmware/microcode upgrade i.e. without controller/director reboot.
		The proposed storage must provide configuration changes and addition or removal of port modules etc. without controller/director reboot.
3	Ports	The proposed storage should have minimum 24 nos. of 16Gbps FC ports for host connectivity and minimum 32 nos. of 6Gbps SAS links/lanes for disk connectivity. Additional ports for replication to be included.
		The proposed storage should be scalable to 64 nos. of 16Gbps FC ports and 64 nos. of 6Gbps SAS links/lanes.
4	Cache	The proposed storage must provide dynamic cache allocation in line with the changing read/write workload.
		The proposed storage must provide protection of cache data during a power down either scheduled or unexpected power outage by battery backup for at least 72 hours OR by de-staging the data in cache to non-volatile Disk.
		The proposed storage controller should be provided with a minimum of 512GB of global cache memory.
		The proposed storage controller should be scalable to minimum 2TB cache memory or higher.
		The proposed storage should support cache coherency. In the event of a controller failure write cache of the redundant controller of the pair should not be disabled, so as not to impact application performance.
5	Disk Drive Support	The proposed storage should support SSD, SAS (10K/15K) disks and NL-SAS (7.2K) disks.
		The proposed storage should support industry standard RAID protection levels - RAID 1, RAID 5 & RAID6 on all types of disk - SSD, SAS, NL-SAS.

		The proposed storage must be scalable to minimum 1200 drives.
6	Global Hot Spare Disks	The proposed SAN storage should dedicate drives as global hot spares that can automatically be used to replace a failed drive anywhere in the storage system. Minimum of two hot spare disks should be provided for every 100 disk drives.
7	Capacity	The proposed storage must be provided with 39 TB of usable capacity using 800GB eMLC SSD with RAID5, 8 TB of usable capacity using 300GB 15K SAS drives with RAID1/0, 76 TB of usable capacity using 600GB 10K drives with RAID5. Global hot spare additional.
8	Performance	The storage should provide minimum 50,000 IOPS with a block size of 8K and 70:30 Read/Write ratios. The storage should support variable performance levels (i.e. response times) for individual applications/workloads. The storage should allow changing the performance levels for individual application at click of a button. The response times on SSD capacity must be <3ms.
9	Automated Storage Tiering	The proposed storage should natively support sub-LUN tiering to achieve improved performance and lower Total cost of Ownership. The storage should support automated movement of data between minimum three tiers of different disk and RAID types. All tiers must be read and write capable. Provide all the necessary licenses for entire offered capacity of automated storage tiering.
		Automated tiering disk groups/pools should allow configuring entire capacity of 123 TB from SSD and SAS in a single pool.
10	Storage Management	The proposed storage array must provide easy to use GUI (web based) and CLI enabled administration interface for configuration, storage management. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.
		The storage management software should provide real-time (upto 24 hours) and historical (at least 6 months) performance monitoring. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.
		The storage management software must provide multiple levels of access control including role-based security, provision to send alerts via email.
11	Encryption	The proposed storage to provide data encryption at rest at controller level or using self-encrypting drives without impacting storage performance. The features should be provided for all proposed disk type.
12	Data Protection	The proposed storage should ensure end-to-end (from the host all the way to disk) data integrity checking using the ANSI T10 data integrity field (DIF) standard or equivalent methods. The T10 data integrity standard or equivalent proprietary methods must be supported on all types of disks.
		The proposed storage should support proactive disk scanning and correction
13	OS Support	The proposed storage should support multiple operating systems such as Microsoft Windows 2008/2012, Linux, HP-UX, IBM-AIX, Solaris, Vmware, Citrix, etc…
		The proposed storage must support host based multi-pathing feature. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.

		The storage should support clustering solutions such as Microsoft cluster, MS SQL cluster, SUN Solaris cluster, Linux cluster, Veritas cluster, HP-UX cluster, IBM AIX cluster etc…
14	Full Copy Clone	The proposed SAN storage should support full copy Clones. The storage should support incremental updates (delta re-synchs) to minimum of 2 targets LUN's (clones) post the initial full sync. Provide all the necessary licenses for entire offered capacity of full copy Clones creation and restore.
15	Pointer based Snapshot	The proposed SAN storage should support pointer based Snapshot. The pointer based Snapshot should be independent of each other, restoring a Snapshot to production LUN should not invalidate the rest of the Snapshot for same production LUN. The proposed storage should support minimum of 8 pointer based Snapshot copies per Source LUN. Provide all the necessary licenses for entire offered capacity for Snapshots creation and restore.
16	Remote Replication	The proposed storage solution should support both Synchronous and Asynchronous Data replication.
		The asynchronous replication in proposed solution should support incremental data update with synchronization period less than 60 seconds to achieve RPO of less than four minute. Provide all the necessary licenses for full capacity of asynchronous replication.
		Storage should allow simultaneous replication of minimum 512 LUN's.
		The replication solution must support three-way zero data loss solution with functionality to provide delta-resync capability from surviving site in case of a disaster.
		The replication solution must support features for saving WAN bandwidth using compression/reduplication or equivalent features.
		The replication solution must be provided using storage based IP ports or FCIP router or equivalent solution.
17	Quality of Service	The proposed storage should provide Quality of Service features thereby prioritizing workloads for specific applications.
18	Thin Provisioning	The proposed storage must provide Virtual/Thin provisioning for storage allocation. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.
		The proposed storage should support space reclamation feature i.e. on-the-fly zero data detection as an extension of Virtual/Thin provisioning on SAN.
19	Storage Virtualization	The proposed solution should be able to virtualize existing storage arrays at NPCI from EMC, IBM, HP, Dell, Net App for provisioning providing a single management interface and hence single point of control.
20	Uptime	The proposed storage should provide a overall uptime of 99.9%.
21	SAN Switches	Provide 2 nos. SAN switches. Each SAN switch should be with dual power supply, 24 ports of 16Gbps active ports. Include 48 nos. of OM3, LC-LC cables 20 meters.

Section 11 - Documents to be put in Envelope "B"

Annexure J - Technical Evaluation Compliance (Additional)

A)	**Blade Chassis**		
	Chassis – Qty-3		
SN	**Component**	**Requirement Specification**	**Complied Y/N**
1	Make/Model	(Specify)	
2	Base Chassis	Chassis should be able to support at least 14 Blade servers or More	
		Same enclosure should support Latest generation of Intel or AMD Blade servers. Vendor should have models on the same	
		Same enclosure should support 2 and 4 Processor based blade servers of latest generation of Intel or AMD processor	
		The maximum height of the Chassis should be 10U	
		Should support Hot Pluggable & Redundant chassis Management Modules	
		Blade Chassis should have a dual/single active/passive midplane OR dual active midplane where the blades and other subsystems get plugged on and provide high availability and performance.	
		Support simultaneous remote access for different servers in the enclosure.	
		Should support stacking of up to 9 chassis	
3	Interconnect support	Should support simultaneous housing of Ethernet (1GbE and 40 GbE), FC, iSCSI, IB interconnect fabrics, offering Hot Pluggable & Redundancy as a feature. Enclosure Should have minimum 6 Interconnect Bays (Including redundancy)	
4	Blade Server Ethernet Interconnect and SAN connectivity	**For LAN Connectivity** - The enclosure should have redundant network modules with 16 X 10 GbE Downlinks (or as per the maximum capacity of the enclosure. 14 or 16 as the case may be.) and at least 8 X 10 GbE uplink ports per module, up linkable to the data center switch. The same modules should support 40GBPS without changing the switch module.	
		The switch should support 1Gbps copper, 10Gbps copper RJ45, 1Gbps SX/Lx, 10Gbps SR/LR, 40Gbps SR/LR, 10G and 40G DAC cable, and 40G to 4 x 10G splitter cables.	
		The switch should be scalable to support L2/L3 IPv4 and IPv6 features and functionality	
		For SAN Connectivity - 16Gbps - 24 port SAN switches to be provided with 12 ports activated (8 internal + 4 External with 16 GBPS SFP Modules)	
5	System Software	Management/controlling software have to be from the OEM itself.	
6	Management	All required System software has to be from the OEM itself.	
		Complete GUI with view of the individual blade chassis, multiple chassis in a rack, blade servers, power consumption at chassis level and blade level. Management – Comprehensive web enabled system management tool that monitors the system health, environment, critical action	

		etc, With its own data engine to store status reports, alerts and error notifications.	
7	Deployment & Remote Management	Complete Hardware based Remote Administration from a standard web-browser with Event logging, detailed server status, Logs, Alert Forwarding, virtual control, remote graphical console, Remote Power Control / Shutdown, Virtual Media for Remote boot and configuration, Virtual Text and Graphical Control. The blade system should have the capability of managing all the blades in the same enclosure simultaneously.	

B) <u>Blade Servers</u>

B)	**Blades Servers – Qty. 3**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied (Y/N)**
1	Make/Model	(specify)	
2	Form Factor	Half height Blade	
3	Processor	2xE5-2667v3	
4	Chipset	Intel C610	
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives	
9	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
10	FC Connectivity	2x16Gbps FC HBA per blade	
11	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	

13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

C) <u>Blade Servers</u>

C)	**Blades Servers – Qty. 2**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied (Y/N)**
1	Make/Model	(specify)	
2	Form Factor	Half height Blade	
3	Processor	2xE5-2667v3	
4	Chipset	Intel C610	
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x16Gbps FC HBA per blade	

10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

D) <u>Blade Servers</u>

D)	**Blades Servers -Qty. 2**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied (Y/N)**
1	Make/Model	(specify)	
2	Form Factor	Full height Blade	
3	Processor	4xE5-4620v2 or higher	
4	Chipset	Intel C600	
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives	
9	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	

		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
10	FC Connectivity	2x16Gbps FC HBA per blade	
11	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
12	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
13	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
14	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.	
15	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
16	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

E) <u>Blade Servers</u>

E)	**Blades Servers -Qty. 4**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied - Y/N**
1	Make/Model	(specify)	
2	Form Factor	Full height Blade	
3	Processor	4xE5-4620v2 or higher	
4	Chipset	Intel C600	
5	Memory	128GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	

7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x8Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for XenServer.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

F) <u>Blade Servers</u>

F)	**Blades Servers – Qty. 6**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied-Y/N**
1	Make/Model	(specify)	
2	Form Factor	Full height Blade	
3	Processor	4xE5-4620v2 or higher	
4	Chipset	Intel C600	
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.	

		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x8Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

G) PR SAN

G)	SAN -Qty-1		
Sr. No	**Component**	**Requirement**	**Complied-Y/N**
1	Storage Architecture	The proposed storage must be a enterprise class SAN storage supporting multiple controllers/directors, offering scale-out architecture for better availability, scalability and performance; whereby processor, global cache, disk, ports can be scaled linearly by adding multiple controllers/directors. The proposed storage must be scalable to minimum four SAN controllers/directors.	
		The proposed SAN storage must be a single enterprise class storage product, and not a storage solution with multiple silo/groups of dual-controller storage in a clustered configuration proposed to meet the performance and scalability requirement.	
		The proposed storage array should be configured in No Single Point of failure including controller, cache, power supply and cooling fans with power cords, etc.	
		The proposed storage should allow Read and Write access to all LUN's from all controllers.	
		The proposed storage should allow stripping of data on drives across all controllers and not limited to drives within silo/group created by a controller pair.	
2	Hardware/Software Upgrades	The proposed storage must provide non-disruptive firmware/microcode upgrade i.e. without controller/director reboot.	
		The proposed storage must provide configuration changes and addition or removal of port modules etc. without controller/director reboot.	
3	Ports	The proposed storage should have minimum 24 nos. of 16Gbps FC ports for host connectivity and minimum 32 nos. of 6Gbps SAS links/lanes for disk connectivity. Additional ports for replication to be included.	
		The proposed storage should be scalable to 64 nos. of 16Gbps FC ports and 64 nos. of 6Gbps SAS links/lanes.	
4	Cache	The proposed storage must provide dynamic cache allocation inline with the changing read/write workload.	
		The proposed storage must provide protection of cache data during a power down either scheduled or unexpected power outage by battery backup for at least 72 hours OR by de-staging the data in cache to non-volatile Disk.	
		The proposed storage controller should be provided with at minimum of 512GB of global	

		cache memory.	
		The proposed storage controller should be scalable to minimum 2TB cache memory or higher.	
		The proposed storage should support cache coherency. In the event of a controller failure write cache of the redundant controller of the pair should not be disabled, so as not to impact application performance.	
5	Disk Drive Support	The proposed storage should support SSD, SAS (10K/15K) disks and NL-SAS (7.2K) disks.	
		The proposed storage should support industry standard RAID protection levels - RAID 1, RAID 5 & RAID6 on all types of disk - SSD, SAS, NL-SAS.	
		The proposed storage must be scalable to minimum 1200 drives.	
6	Global Hot Spare Disks	The proposed SAN storage should dedicate drives as global hot spares that can automatically be used to replace a failed drive anywhere in the storage system. Minimum of two hot spare disks should be provided for every 100 disk drives.	
7	Capacity	The proposed storage must be provided with 34 TB of usable capacity using 800GB eMLC SSD with RAID5, 6 TB of usable capacity using 300GB 15K SAS drives with RAID1/0, 56 TB of usable capacity using 600GB 10K drives with RAID5. Global hot spare additional.	
8	Performance	The storage should provide minimum 50,000 IOPS with a block size of 8K and 70:30 Read/Write ratio. The storage should support variable performance levels (i.e. response times) for individual applications/workloads. The storage should allow changing the performance levels for individual application at click of a button. The response times on SSD capacity must be <3ms.	
9	Automated Storage Tiering	The proposed storage should natively support sub-LUN tiering to achieve improved performance and lower Total cost of Ownership. The storage should support automated movement of data between minimum three tiers of different disk and RAID types. All tiers must be read and write capable. Provide all the necessary licenses for entire offered capacity of automated storage tiering.	
		Automated tiering disk groups/pools should allow configuring entire capacity of 96 TB from SSD and SAS in a single pool.	
10	Storage Management	The proposed storage array must provide easy to use GUI (web based) and CLI enabled administration interface for configuration, storage management. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	

		The storage management software should provide real-time (upto 24 hours) and historical (atleast 6 months) performance monitoring. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The storage management software must provide multiple levels of access control including role-based security, provision to send alerts via email.	
11	Encryption	The proposed storage to provide data encryption at rest at controller level or using self-encrypting drives without impacting storage performance. The features should be provided for all proposed disk type.	
12	Data Protection	The proposed storage should ensure end-to-end (from the host all the way to disk) data integrity checking using the ANSI T10 data integrity field (DIF) standard or equivalent methods. The T10 data integrity standard or equivalent proprietary methods must be supported on all types of disks.	
		The proposed storage should support proactive disk scanning and correction	
13	OS Support	The proposed storage should support multiple operating systems such as Microsoft Windows 2008/2012, Linux, HP-UX, IBM-AIX, Solaris, VMware, Citrix, etc…	
		The proposed storage must support host based multi-pathing feature. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The storage should support clustering solutions such as Microsoft cluster, MS SQL cluster, SUN Solaris cluster, Linux cluster, Veritas cluster, HP-UX cluster, IBM AIX cluster etc…	
14	Full Copy Clone	The proposed SAN storage should support full copy Clones. The storage should support incremental updates (delta re-synch) to minimum of 2 target LUN's (clones) post the initial full sync. Provide all the necessary licenses for entire offered capacity of full copy Clones creation and restore.	
15	Pointer based Snapshot	The proposed SAN storage should support pointer based Snapshot. The pointer based Snapshot should be independent of each other, restoring a Snapshot to production LUN should not invalidate the rest of the Snapshot for same production LUN. The proposed storage should support minimum of 8 pointer based Snapshot copies per Source LUN. Provide all the necessary licenses for entire offered capacity for Snapshots creation and restore.	

16	Remote Replication	The proposed storage solution should support both Synchronous and Asynchronous Data replication.	
		The asynchronous replication in proposed solution should support incremental data update with synchronization period less than 60 seconds to achieve RPO of less than four minute. Provide all the necessary licenses for full capacity of asynchronous replication.	
		Storage should allow simultaneous replication of minimum 512 LUN's.	
		The replication solution must support three-way zero data loss solution with functionality to provide delta-resync capability from surviving site in case of a disaster.	
		The replication solution must support features for saving WAN bandwidth using compression/reduplication or equivalent features.	
		The replication solution must be provided using storage based IP ports or FCIP router or equivalent solution.	
17	Quality of Service	The proposed storage should provide Quality of Service features thereby prioritizing workloads for specific applications.	
18	Thin Provisioning	The proposed storage must provide Virtual/Thin provisioning for storage allocation. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The proposed storage should support space reclamation feature i.e. on-the-fly zero data detection as an extension of Virtual/Thin provisioning on SAN.	
19	Storage Virtualization	The proposed solution should be able to virtualize existing storage arrays at NPCI from EMC, IBM, HP, Dell, Net App for provisioning providing a single management interface and hence single point of control.	
20	Uptime	The proposed storage should provide an overall uptime of 99.9%.	
21	SAN Switches	Provide 2 nos. SAN switches. Each SAN switch should be with dual power supply, 24 ports of 16Gbps active ports. Include 48 nos. of OM3, LC-LC cables 20 meters.	

Additional Servers and Storage Technical Specifications compliance -DR Site

A) Blade Chassis

A)	Chassis – Qty. 2		
SN	**Component**	**Requirement Specification**	**Complied-Y/N**
1	Make/Model		
2	Base Chassis	Chassis should be able to support at least 14 Blade servers or More	
		Same enclosure should support Latest generation of Intel or AMD Blade servers. Vendor should have models on the same	
		Same enclosure should support 2 and 4 Processor based blade servers of latest generation of Intel or AMD processor	
		The maximum height of the Chassis should be 10U	
		Should support Hot Pluggable & Redundant chassis Management Modules	
		Blade Chassis should have a dual/single active/passive midplane OR dual active midplane where the blades and other subsystems get plugged on and provide high availability and performance.	
		Support simultaneous remote access for different servers in the enclosure.	
		Should support stacking of up to 9 chassis	
3	Interconnect support	Should support simultaneous housing of Ethernet (1GbE and 40 GbE), FC, iSCSI, IB interconnect fabrics, offering Hot Pluggable & Redundancy as a feature. Enclosure Should have minimum 6 Interconnect Bays (Including redundancy)	
4	Blade Server Ethernet Interconnect and SAN connectivity	For LAN Connectivity - The enclosure should have redundant network modules with 16 X 10 GbE Downlinks (or as per the maximum capacity of the enclosure. 14 or 16 as the case may be.) and at least 8 X 10 GbE uplink ports per module, up linkable to the data center switch. The same modules should support 40GBPS without changing the switch module.	
		the switch should support 1Gbps copper, 10Gbps copper RJ45, 1Gbps SX/Lx, 10Gbps SR/LR, 40Gbps SR/LR, 10G and 40G DAC cable, and 40G to 4 x 10G splitter cables.	
		The switch should be scalable to support L2/L3 IPv4 and IPv6 features and functionality	
		For SAN Connectivity -16 GBPS 24 port SAN switches to be provided with 12 ports activated. (8 internal + 4 External with 16 GBPS SFP Modules)	
5	System Software	Management/controlling software have to be from the OEM itself.	
6	Management	All required System software has to be from the OEM itself.	
		Complete GUI with view of the individual blade chassis, multiple chassis in a rack, blade servers, power consumption at chassis level and blade level. Management – Comprehensive web enabled system management tool that monitors the system health, environment, critical action	

		etc, With its own data engine to store status reports, alerts and error notifications.	
7	Deployment & Remote Management	Complete Hardware based Remote Administration from a standard web-browser with Event logging, detailed server status, Logs, Alert Forwarding, virtual control, remote graphical console, Remote Power Control / Shutdown, Virtual Media for Remote boot and configuration, Virtual Text and Graphical Control. The blade system should have the capability of managing all the blades in the same enclosure simultaneously.	

B) Blade Servers

B)	Blades Servers – Qty. 3		
SN	**Component**	**Requirement Specification**	**Complied-Y/N**
1	Make/Model	(specify)	
2	Form Factor	Half height Blade	
3	Processor	2xE5-2667v3	
4	Chipset	Intel C610	
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x16Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of HyperVisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server,	

		VMWare ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

C) Blade Servers

C)	Blades Servers – Qty. 2		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied-Y/N**
1	Make/Model	(specify)	
2	Form Factor	Half height Blade	
3	Processor	2xE5-2667v3	
4	Chipset	Intel C610	
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	2 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x16Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support;	

	Standard Compliance	Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMWare ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

D) Blade Servers

D)	Blades Servers – Qty. 1		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied-Y/N**
1	Make/Model	(specify)	
2	Form Factor	Full height Blade	
3	Processor	4xE5-4620v2 or higher	
4	Chipset	Intel C600	
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x16Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	

11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

E) <u>Blade Servers</u>

E)	**Blades Servers – Qty. 2**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied-Y/N**
1	Make/Model	HP, IBM, DELL(specify)	
2	Form Factor	Full height Blade	
3	Processor	4xE5-4620v2 or higher	
4	Chipset	Intel C600	
5	Memory	128GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x8Gbps FC HBA per blade	

10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

F) <u>Blade Servers</u>

F)	**Blades Servers – Qty. 3**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied-Y/N**
1	Make/Model	(specify)	
2	Form Factor	Full height Blade	
3	Processor	4xE5-4620v2 or higher	
4	Chipset	Intel C600	
5	Memory	256GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	4 * 300 GB 15K hot-plug SAS Drives	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map	

		various applications, networks.	
9	FC Connectivity	2x16Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

G) <u>Blade Server</u>

G)	**Blades Servers – Qty. 1**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied Y/N**
1	Make/Model	(specify)	
2	Form Factor	Full height Blade	
3	Processor	2 x E5-2643(3.4Ghz, 6 core CPU)	
4	Chipset	Intel C600	
5	Memory	256 GB, at least 50% memory slots should be free for future expandability	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	
7	Internal Storage	2x800GB SAS based SSDs	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	

		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x16 Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

H) <u>Blade Server</u>

H)	**Blades Servers – Qty. 1**		
SN	**Component**	**Requirement Specification (As per RFP)**	**Complied-Y/N**
1	Make/Model	(specify)	
2	Form Factor	Half height Blade	
3	Processor	2 * E5-2643(3.4Ghz, 6 core CPU)	
4	Chipset	Intel C610	
5	Memory	64GB of memory with 50% headroom for expandability without changing the existing modules.	
		Should support Advanced memory protection features like multi-bit error correction, memory mirroring.	
6	RAID Controller	Integrated SAS Raid Controller supporting RAID 0 and 1 and battery backed (Or equivalent technology) cache.	

7	Internal Storage	2x800GB SAS based SSDs	
8	Ethernet card	4 * 10Gb multifunctional network ports per Blade server with support for iSCSI, FCoE protocols	
		Each of the network port should be capable of tailoring network connections and speeds based on application needs	
		The proposed Converged Network Adapter should support Switch Independent NIC partitioning allowing for multiple virtual NICs and HBAs ports offering more flexibility to map various applications, networks.	
9	FC Connectivity	2x16Gbps FC HBA per blade	
10	USB Ports	One (1) internal and Two (2) External USB ports Blade server should also support slots for redundant SD card or equivalent storage on the motherboard for the use of Hypervisor	
11	Expansion Slots	Minimum of 2 PCI-e based x8 slots supporting Ethernet/FC adapters	
12	Industry Standard Compliance	ACPI 2.0 Compliant; PCI 2.2 Compliant; WOL Support; Microsoft®;Logo certifications; USB 2.0 Support	
13	Operating System	Should support Microsoft Windows Server, Windows Server Hyper-V, Red Hat Enterprise Linux, SuSE Linux Enterprise Server, VMware ESX server, Citrix Essentials for Xenserver.	
14	Manageability	Should support unified management suite that can monitor and manage all the servers from the Vendor deployed in our data center.	
15	Remote Management	Should be possible to manage the servers and get access to critical information about the health of the server from any remote location with just the help of a standard Web browser (Internet explorer)	
		Hardware based and OS independent remote management. Remote management should support remote power on/off of the server and should have the capability to boot the blade server from a remote floppy or CDROM drive or an image of the same.	
		Should be possible to remotely manage each blade server individually. Should support access rights for administrators for each blade server individually. Should be able to manage multiple blades in the same enclosure at the same time.	

I) <u>DR SAN</u>

I)	SAN-Qty-1 No		
Sr. No	**Component**	**Specifications**	**Complied-Y/N**
1	Storage Architecture	The proposed storage must be a enterprise class SAN storage supporting multiple controllers/directors, offering scale-out architecture for better availability, scalability and performance; whereby processor, global cache, disk, ports can be scaled linearly by adding multiple controllers/directors. The proposed storage must be scalable to minimum four SAN controllers/directors.	
		The proposed SAN storage must be a single enterprise class storage product, and not a storage solution with multiple silo/groups of dual-controller storage in a clustered configuration proposed to meet the performance and scalability requirement.	
		The proposed storage array should be configured in No Single Point of failure including controller, cache, power supply and cooling fans with power cords, etc.	
		The proposed storage should allow Read and Write access to all LUN's from all controllers.	
		The proposed storage should allow stripping of data on drives across all controllers and not limited to drives within silo/group created by a controller pair.	
		The proposed storage offered should be of latest generation enterprise storage.	
2	Hardware /Software Upgrades	The proposed storage must provide non-disruptive firmware/microcode upgrade i.e. without controller/director reboot.	
		The proposed storage must provide configuration changes and addition or removal of port modules etc. without controller/director reboot.	
3	Ports	The proposed storage should have minimum 24 nos. of 16Gbps FC ports for host connectivity and minimum 32 nos. of 6Gbps SAS links/lanes for disk connectivity. Additional ports for replication to be included.	
		The proposed storage should be scalable to 64 nos. of 16Gbps FC ports and 64 nos. of 6Gbps SAS links/lanes.	
4	Cache	The proposed storage must provide dynamic cache allocation in line with the changing read/write workload.	
		The proposed storage must provide protection of cache data during a power down either scheduled or unexpected power outage by battery backup for at least 72 hours OR by de-staging the data in cache to non-volatile Disk.	
		The proposed storage controller should be provided with a minimum of 512GB of global cache memory.	
		The proposed storage controller should be scalable to minimum 2TB cache memory or higher.	
		The proposed storage should support cache coherency. In the event of a controller failure write cache of the redundant controller of the pair should not be disabled, so as not to impact application performance.	
5	Disk Drive Support	The proposed storage should support SSD, SAS (10K/15K) disks and NL-SAS (7.2K) disks.	

		The proposed storage should support industry standard RAID protection levels - RAID 1, RAID 5 & RAID6 on all types of disk - SSD, SAS, NL-SAS.	
		The proposed storage must be scalable to minimum 1200 drives.	
6	Global Hot Spare Disks	The proposed SAN storage should dedicate drives as global hot spares that can automatically be used to replace a failed drive anywhere in the storage system. Minimum of two hot spare disks should be provided for every 100 disk drives.	
7	Capacity	The proposed storage must be provided with 39 TB of usable capacity using 800GB eMLC SSD with RAID5, 8 TB of usable capacity using 300GB 15K SAS drives with RAID1/0, 76 TB of usable capacity using 600GB 10K drives with RAID5. Global hot spare additional.	
8	Performance	The storage should provide minimum 50,000 IOPS with a block size of 8K and 70:30 Read/Write ratios. The storage should support variable performance levels (i.e. response times) for individual applications/workloads. The storage should allow changing the performance levels for individual application at click of a button. The response times on SSD capacity must be <3ms.	
9	Automated Storage Tiering	The proposed storage should natively support sub-LUN tiering to achieve improved performance and lower Total cost of Ownership. The storage should support automated movement of data between minimum three tiers of different disk and RAID types. All tiers must be read and write capable. Provide all the necessary licenses for entire offered capacity of automated storage tiering.	
		Automated tiering disk groups/pools should allow configuring entire capacity of 123 TB from SSD and SAS in a single pool.	
10	Storage Management	The proposed storage array must provide easy to use GUI (web based) and CLI enabled administration interface for configuration, storage management. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The storage management software should provide real-time (upto 24 hours) and historical (at least 6 months) performance monitoring. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The storage management software must provide multiple levels of access control including role-based security, provision to send alerts via email.	
11	Encryption	The proposed storage to provide data encryption at rest at controller level or using self-encrypting drives without impacting storage performance. The features should be provided for all proposed disk type.	
12	Data Protection	The proposed storage should ensure end-to-end (from the host all the way to disk) data integrity checking using the ANSI T10 data integrity field (DIF) standard or equivalent methods. The T10 data integrity standard or equivalent proprietary methods must be supported on all types of disks.	
		The proposed storage should support proactive disk scanning and correction	
13	OS Support	The proposed storage should support multiple operating systems such as Microsoft Windows 2008/2012, Linux, HP-UX, IBM-AIX, Solaris, Vmware, Citrix, etc…	

		The proposed storage must support host based multi-pathing feature. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The storage should support clustering solutions such as Microsoft cluster, MS SQL cluster, SUN Solaris cluster, Linux cluster, Veritas cluster, HP-UX cluster, IBM AIX cluster etc…	
14	Full Copy Clone	The proposed SAN storage should support full copy Clones. The storage should support incremental updates (delta re-synchs) to minimum of 2 targets LUN's (clones) post the initial full sync. Provide all the necessary licenses for entire offered capacity of full copy Clones creation and restore.	
15	Pointer based Snapshot	The proposed SAN storage should support pointer based Snapshot. The pointer based Snapshot should be independent of each other, restoring a Snapshot to production LUN should not invalidate the rest of the Snapshot for same production LUN. The proposed storage should support minimum of 8 pointer based Snapshot copies per Source LUN. Provide all the necessary licenses for entire offered capacity for Snapshots creation and restore.	
16	Remote Replication	The proposed storage solution should support both Synchronous and Asynchronous Data replication.	
		The asynchronous replication in proposed solution should support incremental data update with synchronization period less than 60 seconds to achieve RPO of less than four minute. Provide all the necessary licenses for full capacity of asynchronous replication.	
		Storage should allow simultaneous replication of minimum 512 LUN's.	
		The replication solution must support three-way zero data loss solution with functionality to provide delta-resync capability from surviving site in case of a disaster.	
		The replication solution must support features for saving WAN bandwidth using compression/reduplication or equivalent features.	
		The replication solution must be provided using storage based IP ports or FCIP router or equivalent solution.	
17	Quality of Service	The proposed storage should provide Quality of Service features thereby prioritizing workloads for specific applications.	
18	Thin Provisioning	The proposed storage must provide Virtual/Thin provisioning for storage allocation. If licensed separately, the vendor needs to provide all the necessary licenses for entire offered capacity.	
		The proposed storage should support space reclamation feature i.e. on-the-fly zero data detection as an extension of Virtual/Thin provisioning on SAN.	
19	Storage Virtualization	The proposed solution should be able to virtualize existing storage arrays at NPCI from EMC, IBM, HP, Dell, Net App for provisioning providing a single management interface and hence single point of control.	
20	Uptime	The proposed storage should provide a overall uptime of 99.9%.	
21	SAN Switches	Provide 2 nos. SAN switches. Each SAN switch should be with dual power supply, 24 ports of 16Gbps active ports. Include 48 nos. of OM3, LC-LC cables 20 meters.	

Annexure N - Commercial Bid Format

1. UPI Solution:

Sr.	A) Hardware-Hyderabad	Qty.	Unit Rate	Total
1	APP Server	8		
2	DB Server	6		
3	Storage (PR +HA)	2		
	Sub-Total-A			
Sr.	**B) Hardware-Chennai**	**Qty.**	**Unit Rate**	**Total**
4	APP Server	4		
5	DB Server	3		
6	Production Server	7		
7	Storage (DR)	1		
	Sub-Total-B			
Sr	**C) Installation Charges at Hyderabad & Chennai Location**	**Qty.**	**Unit Rate**	**Total**
a	Installation of Servers	28		
b	Installation of Storage	3		
	Sub-Total-C			
Sr	**D) AMC Hardware Charges**	**Qty.**	**Unit Rate**	**Total**
a	AMC hardware -4th Year	28		
b	AMC Hardware 5th Year	28		
	Sub-Total-D			

Sr.	E) Resource Requirement	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	**Onsite Engineer for 6 days a week as per NPCI working hours during the entire contract period**						
	Sub-Total- E						

Total 1 = A + B + C + D + E

2. RGCS PROJECT:

Sr.	A) Hardware-CHENNAI PR SITE	Qty.	Unit Rate	Total
1	Blade Chassis	3		
2	Blades Servers	3		
3	Blades Servers	2		
4	Blades Servers	2		
5	Blades Servers	4		
6	Blades Servers	6		
7	SAN	1		
	TOTAL-A			
	B) Hardware-HYDERABAD DR SITE			
1	Blade Chassis	2		
2	Blades Servers	3		
3	Blades Servers	2		
4	Blades Servers	1		
5	Blades Servers	2		
6	Blades Servers	3		
7	Blades Servers	1		
8	Blades Servers	1		
9	SAN	1		
	TOTAL-B			
Sr.	**C) Installation Charges at Chennai & Hyderabad Location**	**Qty.**	**Unit Rate**	**Total**
a.	Installation of Chassis	5		
b.	Installation of Servers	30		
c.	Installation of SAN	2		
	Sub-Total-C			
Sr.	**D) AMC Hardware Charges**	**Qty.**	**Unit Rate**	**Total**
a	AMC hardware -4th Year	37		
b	AMC Hardware 5th Year	37		
	Sub-Total-D			

Total-2: Total 1 = A + B + C + D

TCO= Total 1+ Total 2=

Above prices are exclusive of taxes.

(All hardware/software costs/Implementation cost/AMC cost should be detailed with line item wise prices and submitted as Annexure L. NPCI reserves the right to add or delete any one of the items as per requirement).

Dated this…… Day of……..2015

(Signature)

(Name) (In the capacity of)

Duly authorized to sign Bid for and on behalf of

All other terms and conditions of aforesaid RFP remain unchanged.

MD & CHIEF EXECUTIVE OFFICER

NATIONAL PAYMENTS CORPORATION OF INDIA
C1001A, B wing 10th Floor,
Bandra Kurla Complex, Bandra (East),
Mumbai – 400 051
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