

# **MAHARISHI DAYANAND UNIVERSITY ROHTAK**

## **CORRIGENDUM**

### **Modifications in specifications of Equipment for Datacenter**

Reference our Advt. published on 19.08.12 in Times of India newspaper at page no. 12 (column 7-8) and Sunday Express at page no. 20 (column 4-5) regarding equipment for datacentre. Changes mainly regarding UTM, client computers, laptops, printers, large format display, software and tape library are given below. All other details/terms and conditions including closing date (17.09.2012) remain same.

Tender must comply with the revised specifications.

REGISTRAR

## Revised Technical Specifications for Data-Centre

**Modified specifications are highlighted in Yellow with bold font.**

S.No.	Item	Description with Specification	Qty
1	<b>Blade Chassis</b>		
	Description	Shall provide common resources for the Blade Servers like power, System Management, Cabling, Ethernet Management and extension, External fiber Channel Storage switching and connectivity. Chassis with all redundancy features. All components to be provided by the OEM and to be fully redundant	1
	Blade Bays and I/O bays	Sufficient Chassis to be provided to accommodate min 14 hot pluggable blades servers with SAS hard disks.	
	Blade Arrangement	Blade chassis should be able to support full and half height blades in combination without limitations on slots. I.e. Full- height blade should be able to sit adjacent to half height blades.	
	Mid-Plane	Chassis configured should not only support current generation of processors but should support future processor technology up to 5 years or more to provide an investment protection made today. High-Availability Dual Path Midplane or Passive Midplane with no active components to meet all reliability requirements for providing two-way communication paths for Ethernet, Fiber Channel, KVM Switches, Power Supply and Management Signals. the chassis should have minimum 5Tbps performance backplane.	
	LAN Interconnect module	2 No's of 10Gbe Switches with sufficient no. of 10Gbps ports with redundant connectivity to each blade servers populated in the chassis with minimum 4 up-link ports on each switch for external connectivity .	
	Management Modules	Dual redundant management modules to communicate with the system management processors on the blade server. The Management Modules shall be capable of providing KVM Connectivity for the Blade servers housed inside the chassis, Real time, actual power cons. Status/Inventory/Alerting for Blades, Chassis Infrastructure, & IOMs; Centralized Configuration; GUI & CLI; SSL/SSH ; Power/Thermal Monitoring; Dynamic power engagement; Temperature monitoring; Persistent WWN/MAC/Virtual Connect - Should allow customers to lock a WWN/MAC/Virtual Connect address into a specific blade slot.	
	Cooling	Chassis should be configured with Hot Swap & Redundant variable speed rear access blowers/ fan Modules	
	Power Module	<b>Chassis should be configured with all the power supplies of highest capacity and should have N+N configuration. Chasis should also support n+1 configuration. Power supplies configured should be 80 PLUS Platinum certified.</b>	
	Form Factor	Up to 10 U -19: Rack Mountable with 28"/32" Depth.	
	System Management	Shall provide support for remote console management, power on/off blades, modules shall monitor power status, operating system, temperature, disks, blowers, power modules system diagnostic programs provided through the management s/w. Real Time Power/Thermal Monitoring and Management	
	Power Management	Chassis should have an integrated tool that can provide a view of the actual power used (as opposed to benchmarked power consumption) and can effectively allocate, match and cap power and thermal limits in the data center at the system, chassis and rack level.	
	System Panel	Chassis should have LED/LCD panel to provide power-on, location, overtemperature, information and system error conditions	
	Ports	Front VGA & 1 USB ports for KVM.	
	SAN Interconnect Modules	Blade Enclosure should be configured with dual redundant hot plug Fiber Channel SAN switch modules with minimum 4 x 8Gbps uplink ports.	
	Optical Disk	Chassis should be configured with Internal/external CD-ROM/DVD-ROM Drive which can be shared among all the blade servers. The chassis should have minimum Two USB 2.0 ports.	
	Failure Alerting Mechanism	The chassis should be able to alert impending failures on maximum number of components like Blades, bridge/switch modules, I/O modules, management modules, power modules, colling modules, media tray	
	Warranty	3 yrs - 24/7 support for all parts on all working days.	

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S.No.	Item	Description with Specification	Qty
<b>2</b>	<b>Blade Servers.</b>	<b>Web Server/ DatabaseServer/ Mail server/ Local server</b>	
	Processor	2 x (Eight Core E5-2450, 2.1 Ghz or higher, 20MB cache or higher)	6
	Memory	64 GB DDR-3 up to 1600MHz ECC Memory Upgradeable to 192 GB	
	Disk Drives	2 x 300GB 6Gbps10K SAS Hard Disk Drive with RAID1.	
	HDD Upgradeability	Should be able to support hot swap SSD drives	
	I/O Slots	2 Number of PCIe generation 3, x8 Slots	
	Ethernet	Server should be configured with 2 Number of 10G Ethernet ports and should support TCP/IP Offload Engine, support for virtual VNIC functionality, iSCSI and FCoE and should be SRIOV capable.	
	SAN HBA Connectivity	Configured with Dual Port 8Gbps Fiber Channel Expansion Card	
	Form Factor	Blade	
	Management	Integrated remote management card for Out of Band alerting, status, inventory, and troubleshooting via Secure Web GUI / CLI (telnet/SSH),Remote Virtual Media (vMedia) and Virtual KVM (vKVM),IPMI2.0 support, Chassis Management w/redundant dedicated NICs; A microcontroller should be responsible for acting as an interface or gateway between the host system (i.e., server management software) and the periphery devices.; Should support web GUI,HW update, Firmware rollback, OS Deployment, Life Cycle Log, View hardware sensors (temperature, voltage, presence, error sensors),Error alerts (server reset, critical sensor values, etc.) using email traps, paging, etc.,IPv6,WS-MAN/SMASH-CLP; redundat SD cards for fail safe hypervisor	
	Remote Server Management Utility	Server should be supplied with OEM Server Management software	
	Operating System compatibility	Red hat Linux 5 or above, Win 2008 standard and enterprise, SuSe Enterprise server 10.	
	Windows OS	All servers has to be supplied with Windows Server 2008 R2 SP1, Enterprise Edition,x64,Including 10 CALs, with Support for High availability clustering	
	Warranty	3 yrs - 24/7 support for all parts on all working days.	

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S.No.	Item	Description with Specification	Qty
<b>3</b>	<b>Tape Library</b>		<b>1</b>
	Make	<b>Tape Library Should be on either of IBM, HP, Dell or from the same OEM supplying servers and blade chasis.</b>	
	Slots	24 Cartridges slots	
	Specifications	Minimum 2 latest generation LTO5 drives.	
	Media	At least <b>50</b> latest generation LTO5 drive Media Cartridges with 5 Cleaning Cartridges, Barcode labels shall also be provided	
	Warranty	3 yrs - 24/7 support for all parts on all working days.	
	<b>Back Up Software Description</b>	All backup/restore administration must be controlled by a centralized master system	
		<b>The master system must support the following systems: Windows 2000/2003/2008/2008R2 Linux (x8664)</b>	
		Supported client systems include: Windows, Linux, Netware, Unix and Mac OS X Platforms	
		The software must be based on Graphical User Interface (GUI) so that all backup servers can be managed centrally, regardless of location	
		The tape format should be open standard MTF for Windows , and CPIO for Unix /Linux for portability and independence.	
		The proposed backup solution must be able to support raw device backup – on both Windows, Linux and Unix (IBM AIX, Sun Solaris & HP UX)	
		Automatic robotic/tape drive configuration. No scripting required.	
		Full backup and restoration capabilities management from remote location.	
		Network bandwidth compression for management of network utilization to reduce loads when backup occurs during production time.	
		Support for leading connectivity protocols like SAN iSCSI / FC, NAS, Ethernet Technologies 10/100/1000/10000 BaseT	
		Must be capable of “block level” backups for Bare Metal Recovery of Physical servers	
		Should have specific agents to perform “hot” backups on the following databases and applications such as: a) oracle on Windows/Linux and Unix b) Informix on windows/Linux and Unix c) Sybase on windows/Linux and Unix d) DB2 on windows/Linux and Unix e) MS SQL on window f) MySQL on Linux and Windows g) Postgres SQL on Linux and Windows h) Ms Exchange on Windows i) Lotus Notes in Windows/Linux and Unix	
		Should meet the following Media Management capabilities a. Allow tape library sharing among media servers b. Allow individual tape drive sharing among media servers and allow for reconfiguration without rebooting media servers c. Tape drive sharing must support both iSCSI and Fiber based connections.	
		The software should be capable of performing latent restores on Windows systems.	
		The software inbuilt reporting tool must has the ability to create customize reports without any additional purchase of another reporting module or 3 <sup>rd</sup> party reporting module	
		The size of index or catalogue file must be less than 100 bytes per files/folder/directories that are being backed up.	

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S.No.	Item	Description with Specification	Qty
		Ability to integrate with storage NAS snapshot based protection mechanisms by providing control GUI module	
		Ability to support and manage snap shot based backup, and file based backup “ under one roof “ while maintaining granular file level recovery.	
		Must support storage protocols such NDMP (version 3 & above). Please provide interoperability matrix with storage appliance firmware/OS release compliance. Specify specific features advantages aligned with the storage vendors	
		Must be able to utilize Direct Access Restore for NDMP technologies to facilitate single file level restore.	
		Should support 5 ways NDMP Backup.	
		Support for server virtualization especially VMWare & Hyper-V	
		Must be integrated with VMware VADP with D2D2T layout. Must be synchronized with VMware VADP for data integrity.	
		Allows full VMware VADP backup by utilizing LAN, SAN and HotAdd advanced transport mechanisms to optimize data transfer of virtual machine backups.	
		Must support virtual machine backup online and supports file level VADP backups for virtual machines running Windows.	
		BOM of Backup agent SQL Server in Cluster Mode Web Server in Cluster Mode Exchange Server 2010 agent Bare Metal Active Director Backup NDMP Backup agent(Minimum 10 TB)	

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S.No.	Item	Description with Specification	Qty
4	<b>Storage Area Network</b>		<b>1</b>
	Specifications	Rack Mountable - Dual Active Controller	
		The storage array shall be configured with at least 16 GB or higher cache mirrored across two storage controllers for disk I/O operations.	
		Host Interface - 4 host ports per controller, Fiber Channel (FC), 8 Gbps per port	
		Drive Interface - Redundant 6Gbps SAS drive ports or 8 Gbps Fiber Channel (FC) ports.	
		Hardware RAID level Supported 0,1,5,6,10	
		Fans & power supplies - Dual redundant, hot-swappable/hot pluggable	
		SAN Support - Box should be compatible of SAN environment	
		Storage subsystem shall support 200GB or Higher SSD, 400/600 GB or higher SAS 10K RPM, 15K RPM or higher disks, NL-SAS/SATA or equivalent 7200 RPM or higher drives in the same storage array.	
		<b>Presently, the storage sub system shall be configured with 10 TB usable on 300 GB 15K RPM drives on raid 5.</b>	
		The storage system must provide upgrade path to larger or future array controller and software technology by controller upgrade or data migration.	
		All the necessary software to configure and manage the storage space, RAID configuration, logical drives allocation, snapshots and snap clones etc.	
		Redundant power supplies, batteries and cooling fans.	
		Load balancing must controlled by system management software tools.	
		The Multi-path software should support supplied or heterogeneous storage and operating.	
		The storage array must have complete cache protection mechanism either by destaging data or providing complete cache data protection with battery backup for up to 72 hours or more.	
		The storage array should support Operating System Platforms & Clustering including Windows Server 2008 (Enterprise Edition) , LINUX for x86. Any software or license required to enable connectivity to all these OS should be included.	
		Storage should support non-disruptive online firmware upgrade for both Controllers.	
		The storage should provide automatic rerouting of I/O traffic from the host in case of primary path failure.	
		Should provision for LUN masking and SAN security.	
		<b>Should support Array Replication &amp; Easy Data Tiering</b>	
		Should support hot-swappable physical drive capacity expansion with the addition of extra hard disks.	
		The storage system should be scalable to more than 200 drives..	
		Should be able to support clustered and individual servers at the same time.	
		Should be able to take —snapshots of the stored data to another logical drive on a different Disk/RAID group for backup purposes.	
		Should be configure with snapshots and clone (local and remote) , licenses for the storage & clone features.	
		Vendor should also offer storage performance monitoring and management software.	
		The vendor must provide the functionality of proactive monitoring of Disk drive and storage system for all possible hard or soft disk failure.	
	Warranty	3 yrs - 24/7 support for all parts on all working days.	

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S.No.	Item	Description with Specification	Qty
5	UTM device		2
	<b>General and Performance Specifications.</b>	The Firewall should be an ASIC based firewall or multi CPU based hardware appliance. For High performance for small packet size	
		The Firewall should have integrated Firewall and VPN functionality.	
		<b>Firewall should deliver a throughput of minimum 15 Gbps</b>	
		3DES/AES with SHA VPN performance should be at least 2.5 Gbps.	
		Firewall packet handling performance should be adequate to deliver the throughput asked for.	
		<b>Firewall should support 5 million Concurrent sessions.</b>	
		Firewall should support at least minimum 50000 new sessions/second.	
		Firewall should be appliance based and should have minimum of 8 x GE ports and 2 x 10GE ports	
		<b>Should have licensed Antivirus with minimum performance 2.5 Gbps and IPS with 8 Gbps</b>	
		Unlimited License for category based Webfiltering and option to create webfiltering based on IP/User/ usergroup.	
		UTM should have option to create policy based on User with integration with RADIUS or LDAP or directly with AD	
		Should have build-in DoS protection as well as Application control without any additional license	
		<b>Operational Modes.</b>	The Firewall should support Layer 2 (Transparent) mode and Layer 3 mode.
	Firewall should support static NAT; Policy based NAT and PAT (Port Addressed Translation).		
	<b>Firewall.</b>	Firewall should provide TCP reassembly for fragmented packet protection.	
		Firewall should be able to support a minimum of 4096 VLANs.	
		Firewall should support Geo-location based rules	
		Explicit Proxy support for HTTP and FTP connection plus for Citrix and Terminal Server as well.	
	<b>VPN.</b>	Firewall should support at least 5000 IPsec tunnels.	
		Firewall should be capable of dynamic routing on VPN.	
		Firewall should support SHA-1 and SHA-2 authentication. This should be Hardware accelerated	
		Firewall should support client based IPsec VPN Tunnels.	
		Firewall should be able to prevent against replay attacks.	
		Firewall should support IPsec NAT Traversal/ALG.	
	Firewall should support SSL VPN. With License of 300 user should be provided from day one.		
	<b>High Availability.</b>	Firewall should support Active/Passive High Availability.	
		Firewall should support Active/Active High Availability.	
		Firewall should support Stateful failover of firewall sessions.	

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S.No.	Item	Description with Specification	Qty
		Firewall should support device failure detection.	
		Firewall should support link failure detection.	
		Firewall should support authentication for HA members.	
		Firewall should support encryption of HA traffic.	
		Support for OSPF and BGP routing protocol	
	<b>Routing.</b>	Support for VRRP and Link Failure Control	
		Firewall should support static routes	
		Should support Multicast with features like RPF, IGMP and PIM.	
		Should support Multicast inside IPsec tunnel.	
		Should support dual stack IPv4 / IPv6 Firewall and VPN.	
	<b>IPv6 Support</b>	Support for IPv4 to/from IPv6 translations or tunneling.	
		Should support Virtualization (Virtual Firewall, Security zones and VLAN). Minimum 10 Virtual Firewall license should be provided	
		Firewall should support Web based (HTTP and HTTPS) configuration and management.	
	<b>Firewall Management</b>	Firewall should support Command Line Interface using console, Telnet and SSH.	
		Firewall should support management via VPN tunnel on any interface.	
		Should support Syslog server logging.	
	<b>Logging.</b>	Should support notification through email.	
		Should be able to integrate with third party logging servers like NetIQ Web Trends.	
		Should have support for SNMP V1 to V3.	
		<b>Support for voice protocols: H.323, SIP, and NAT/ ALG for H.323/ SIP.</b>	
		PKI Certificate requests (PKCS 12).	
	<b>Firewall should have following PKI Support.</b>	Automated certificate enrolment (SCEP).	
		Online Certificate Status Protocol (OCSP).	
		Firewall should support multilevel administration privilege.	
	<b>Administration.</b>	Firewall should support software upgrades using secure web Interface	
		Firewall should support Command Line Interface using console SSH.	
		Firewall should support management via VPN tunnel on any interface.	
		Should support configuration rollback.	
		UTM should have ICSA certification for Firewall,SSL VPN,Antivirus and IPS	



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S.No.	Item	Description with Specification	Qty
	<b>Anti-Bot</b>	Solution should do multi-dimensional Analysis of Traffic and identify BOT, Assess the damage BOT can create and Stop the BOT to communicate to Command & Control (henceforth C&C).	
		Solution should have its own Threat cloud to detect latest Bots prevailing and give us an early advantage in combat against Bots. (For Example: like Check Point SENSORNET & Cisco SIO Services & Damballa Failsafe Services). Proposed solution should have dynamic cloud base with globally deployed sensor network in order to have dynamic understanding of the BOT & malware traffic	
		Solution should be able to identify remote operator hideouts, unique botnet communication patterns and attack behavior.	
		Solution Should perform analysis based on following Minimum parameters like Reputation, Patterns (over multiple protocols such as HTTP, DNS & SMTP, etc.).	
		It should detect the Bot damages & actions by detecting attack types, such as Spam (leveraging outbound mail analysis) and Click fraud, as well as anomalies (irregular ports, protocols)	
		Solution should provide automatic updates to the Anti- latest IP/URL/DNS reputation data and botnet communication patterns.	
		Solution should be able to identify suspicious activities such as participating in DDoS attacks, self-distribution attempts, and participating in click fraud	
		Solution should provide detailed infection information per malware type and/or infected users and machines and details such as executable run, used protocols etc. so that it can be cleaned form the machine as BOT changes there face and it's important to get rid of them form the system	
		Solution should be able to perform Packet capture to view data sent using complete per-session packet capture	
		Solution should assess damages & actions by analyzing types of attack, such as Spam, Click frauds & anomalies leveraging outbound mail analysis and irregular ports, protocols analysis.	
		Solution should be able to identify specific bot communication pattern and block specifically Infected communication and not the entire communication with the server.	
		Solution should be a dedicated engine for advance malware analysis & identification	
		Proposed solution should have reputation based database on malicious Bot network along with the Confidence Indexing for the Sites (URL/DNS/IP)	

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S.No.	Item	Description with Specification	Qty
	<b>URL and Application Control</b>	Solution should be able to perform packet capture to view data sent using complete per-session packet capture with SSL inspection	
		Solution should be able to identify 4 Million + Malware signatures and 2.5 Lakh Malicious website with dynamic updates for any new enterant in this area.	
		Solution Should have minimum 2 lakh + Web 2.0 applications and socila network widgets.	
		Solution should have minimu 60 categories including instant messaging, Peer to peer, Voice and Vedio and File share etc.	
		Solution should have minimum70 mil URL data base.	
		Enabled and customized per policy with individual editable notification to end-user (multi-language)	
		Self-learning - prevents recurring incident management within same mail thread	
		Two notification methods - email reply or system tray pop-up	
		Ask User (self-prevent with UserCheck) - places message in quarantine, send notification to end-user, request self-remediation	
		Prevent - block message from being sent and notifying the end-user	
		Detect - log incidents	
		Inform User - allow transmission, but notifies user to educate of potential risk	
		<b>Certification</b>	IPS must be NSS Labs Recommended with a minimum effectiveness of 97 % and 100% anti-evasion coverage
	OEM should be in Leaders Quardrant for Gartner for minimum last three years in a Enterprise Network Security		
	IPS vendor must be among the first three in NSS Labs results		
	Firewall Vendor must Support FIPS,common Creteria,NSS,CESG,IPV6,VPNC,Bits,Sec 508		
	<b>Warranty</b>	3 yrs - 24/7 support for all parts on all working days.	

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S.No.	Item	Description with Specification	Qty
6	<b>Rack Infrastructure</b>		1
		Floor Standing Server Rack - 42U with Heavy Duty Extruded Aluminium Frame for rigidity. Top cover with FHU provision. Top & Bottom cover with cable entry gland plates. Heavy Duty Top and Bottom frame of MS. Two pairs of 19 mounting angles with 'U' marking. Depth support channels 3 pairs with an overall weight carrying capacity 500Kgs.	
		The racks should conform to Standard for Cabinets, Racks, Panels and associated Equipment and accommodate industry standard 19 rack mount equipment. Should be from same OEM of server & Storage	
		Front and Back doors should be perforated with at least 63% or higher perforations.	
		All racks should be OEM racks with Adjustable mounting depth, Multi-operator component compatibility, Numbered U positions, Powder coat paint finish and Protective grounding provisions.	
		All racks should have mounting hardware 2 Packs, Blanking Panel (4u to 5U size) Keyboard Tray with BB Slides (Rotary Type) (1 no. per Rack), stationary shelf 627 Mm (2 sets per Rack).	
		All racks must be lockable on all sides with unique key for each rack	
		Racks should be compatible with floor-throw as well as top-throw cooling system.	
		Racks should have Rear Cable Management channels, Roof and base cable access	
		Wire managers: Two vertical and four horizontal.	
		Door: The racks must have steel (solid / grill / mesh) front / rear doors and side panels. Racks should NOT have glass doors / panels. Both the front and rear doors should be designed with quick release hinges allowing quick and easy detachment without the use of tools.	
		Fan trays: - Fan 90CFM 230V AC, 4" dia (4 Nos. Per Rack) - Fan Housing Unit 4 Fan Position (Top Mounted) (1 no. Per Rack) .	
		Depth Min. 1000 mm	
		Metal Aluminum extruded profile	
		Side panel Detachable side panels (set of 2 per Rack)	
		Width 19" equipment mounting, extra width is recommended for managing voluminous cables	

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S.No.	Item	Description with Specification	Qty
7		<b>Power Distribution Unit for Rack</b>	2
		Switched receptacles provide remote on and off functionality to allow for power cycling and to help prevent unintended overloading	
		Monitored power draw at the receptacle level	
		Graphical LCD should show input current of each phase enabling Intuitive load balancing	
		Detailed data-logging for statistical analysis and diagnostics	
		Comprehensive power management and flexible configuration through a web browser, NMS, Telnet, SNMP, or HyperTerminal (console)	
		Supply power to 24 receptacles	
		Onboard web interface for remote management	
		Organizes power distribution and simplifies cable management	
		32-amp circuit breakers protect against overload conditions	
		Flash upgradeable for quick and easy upgrades	
8		<b>Rack Mountable Folding LCD Monitor with In-built Keyboard &amp; Mouse (same OEM of Server &amp; Storage)</b>	1
		1 U Rack Mount	
		Foldable	
		Display size: 17 inches diagonal	
		Contrast Ratio: 700:1	
		Display colours: 16 million	
		Resolution: SXGA 1280 x 1024	
		Brightness: 300 nit	
		Compatible to both PS/2 and USB based inputs	

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S.No.	Item	Description with Specification	Qty
9	<b>Client Computers</b>		12
	Processor	Intel(R) Core(TM) i7-3770 Processor (8M Cache, up to 3.90 GHz, w/Integrated HD4000	
	Motherboard Chipset	Q77	
	Video	<b>1GB AMD RADEON HD 7570 or equivalent, LP, with DVI-VGA Adapter</b>	
	Network	Integrated Intel® 82579LM Ethernet LAN 10/100/1000	
	Ports	<b>4 External USB 3.0 ports (2 front, 2 rear) and 6 External USB 2.0 ports (2 front, 4 rear) and 2 Internal USB 2.0 (MT/DT only); 1 RJ-45; 1 VGA; 1 Display Port; 2 Line-in (stereo/microphone), 2 Lineout(headphone/speaker)</b>	
	Sound Controller	Integrated Audio	
	Memory	8GB (2x4GB) Non-ECC DDR3 1600MHz SDRAM Memory expandable to 32 GB RAM Up to 4 DIMM slots	
	Storage	1TB 7200 RPM 3.5" 512e/4k SATA Hard Drive	
	Optical Drive	DVD R/W	
	Keyboard & Mouse	USB Optical Mouse/KB	
	Monitor	<b>24"W Full HD Monitor with LED Advanced Exchange (Next Business Day) with 1920x1080 or higher resolution.</b>	
	Power Management	250W up to 90% Efficient PSU; Energy Star 5.0 compliant, Active PFC	
	System Chassis	tool less DT Chassis less than 16 lts	
	OS Support	Win 7 Professional Pre installed.	
10	<b>Client Computers(Low End)</b>		30
	Processor	Intel(R) Core(TM) i5-3550 Processor 3rd Generation (Min 6M Cache, up to 3.70 GHz, w/Integrated HD2500	
	Motherboard Chipset	Q77	
	Video	Integrated	
	Network	Integrated Intel® 82579LM Ethernet LAN 10/100/1000	
	Ports	<b>4 External USB 3.0 ports (2 front, 2 rear) and 6 External USB 2.0 ports (2 front, 4 rear) and 2 Internal USB 2.0 (MT/DT only); 1 RJ-45; 1 VGA; 1 Display Port; 2 Line-in (stereo/microphone), 2 Lineout(headphone/speaker)</b>	
	Sound Controller	Integrated Audio	
	Memory	8GB (2x4GB) Non-ECC DDR3 1600MHz SDRAM Memory expandable to 32 GB RAM Up to 4 DIMM slots	
	Storage	500GB 7200 RPM 3.5" 512e/4k SATA Hard Drive	
	Optical Drive	DVD R/W	
	Keyboard & Mouse	USB Optical Mouse/KB	
	Monitor	<b>20" Monitor with LED backlight TCO 5 with Advance exchange ( NBD Support) with 1366 x 768 or higher resolution.</b>	
	Power Management	250W up to 90% Efficient PSU; Energy Star 5.0 compliant, Active PFC	
	System Chassis	tool less DT Chassis less than 16 lts	
	OS Support	Win 7 Professional Pre installed.	

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S.No.	Item	Description with Specification	Qty
11	<b>Laptops</b>		4
	Processor	3rd gen Intel® Core™ i5-3210M processor (with Turbo Boost 2.5 up to 3.1 GHz)	
	Motherboard Chipset	Intel® Mobile HM77 Panther Point Express Chipset	
	Video	Nvidia GeForce GT 630M 1GB	
	Network	Intel® Mobile HM77 Panther Point Express Chipset	
	Ports	USB 3.0 X 3 , USB 3.0 with Power Share x 1 (4 total) ,VGA, HDMI, LAN RJ-45, Power, headphone/ headset/ speaker out	
	Sound Controller	Integrated.	
	Memory	4 GB RAM.	
	Storage	500GB – 7200RPM SATA Hard Drive.	
	Optical Drive	DVD R/W.	
	Keyboard & Mouse	Backlit Keyboard w/ Multi-touch Touchpad.	
	Monitor	<b>HD Display (1366 x 768) w/anti-glare.</b>	
	Power Management	6 cell battery.	
	Carry Case	Carry case-same as of OEM.	
	Weight	<b>2.3 kg or less.</b>	
	OS Support	Win 7 Professional Pre installed.	
12	<b>UPS</b>		3
	Description	10 KVA dual Online UPS, 3 Phase In 1 Phase Out with atleast 4 Hrs backup, Intelligent web based Management.	
13	<b>Printers</b>		
	Printers	<b>HP LaserJet M9050 with stacker or equivalent MFP Printer A3, 55 PPM 2, 2 sets of toner cartridges</b>	3
		<b>HP LaserJet 9040DN with stacker or equivalent Printer A3, 2 sets of toner cartridges</b>	3
		<b>HP Designjet 111 or better with paper roll and tray feed, 2 sets of ink cartridges</b>	
		<b>Heavy Duty Line Matrix Printer min 1200 lines Per Minute</b>	2
14	<b>Large Format Displays(LED)</b>		
	Screen	46" LED, 16:9 Display Ratio, Full HD Display, 100hz minimum	1
	Ports	HDMI, min 2 USB ports, RJ 45, Wireless LAN Built-in	
	Viewing Angle	178° (Right/Left), 178° (Up/Down)	
	<b>Large Format Displays(LED)</b>		
	Screen	40" LED, 16:9 Display Ratio, Full HD Display, 100hz minimum	3
	Ports	HDMI, min 2 USB ports, RJ 45, Wireless LAN Built-in	
	Viewing Angle	178° (Right/Left), 178° (Up/Down)	

## Revised Technical Specifications for Data-Centre

**Modified specifications are highlited in Yellow with bold font.**

S.No.	Item	Description with Specification	Qty
15	<b>SOFTWARE (Licenses subject to the latest edition as available before the date of delivery)</b>		
a	Server	<b>Visual Studio.net 2010/12 Ultimate Edition</b>	10
b	Development Tools	Telerik Rad Control Universal Suite (Development Controls)	10
		Dev Express Control Universal Suite (Development Controls)	10
		Adobe Creative Suite 6 Master Collection	10
	Database	<b>Sql Server 2012 Enterprise Edition</b>	for 2 servers
c	exchange server	Exchange Server 2010 with 1000 Cal Licence	2 License
d	Office	<b>MS Office 2010 Volume License, free as when update available to 2012</b>	50 Licence
	Antivirus	<b>Symantec End Point Protection 12.0</b>	70 Licence