



## CSIR-National Botanical Research Institute

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Advt. No :NBRI/SPO/2016/01

### **Notice for Expression of Interest (EOI)** **Pre-Indent Conference**

CSIR-National Botanical Research Institute (NBRI), Lucknow is a premier R&D institute of Council of Scientific & Industrial Research (CSIR), intends to procure the item(s) mentioned herein under. In this regard, a Pre-Indent Conference (PIC) is being organized to finalize the broad technical specifications of the required item(s) as mentioned below. Prospective OEM/Distributors/Authorized Service Providers having capabilities to supply, installations, commissioning and maintenance of such required item(s)/system(s) are invited to make technical presentations during the PIC followed by discussions on technology, design, features, utility, technical parameters, warranty, AMC and other related Techno-Commercial issues. Schedule of Pre-Indent Conference is as follows: -

Sr.No./ (Reference No.)	Description of item	Date	Time	Venue
1 /(8/110/15-P)	High Performance Computing (HPC) etc.	10th March, 2016	10:30 A.M.(IST) onward	Committee Room, Annexed to Canteen of CSIR-NBRI, Rana Pratap Marg, Lucknow - 226001 (Uttar Pradesh, India)
2 /(8/113/15-P)	Upgradation for 10G links of existing LAN network etc.	10th March, 2016	14:30 P.M.(IST) onward	Committee Room, Annexed to Canteen of CSIR-NBRI, Rana Pratap Marg, Lucknow - 226001 (Uttar Pradesh, India)

Further, the tentative specifications of above mentioned items may be seen on our website i.e. [www.nbri.res.in](http://www.nbri.res.in) under **Advertisement(Tender)** head . Corrigendum/Amendment (if any) will be posted over our website. Prospective parties are requested to frequently visit our website for the purpose. Prospective OEM/Distributors/Authorized Service Providers who are willing to participate in the PIC process may send their willingness to the **Stores & Purchase Officer**, NBRI and depute their authorized representative(s) who is/are techno-commercially competent to present their product/solution, discuss with the technical committee and provide supporting document/information. The credentials, technical capability, financial standing & track record of the parties, will be evaluated based upon discussions during PIC and documents submitted by the interested parties who attends PIC. Limited tenders will only be invited (under two bid system) from such parties which has been declared shortlisted after PIC discussions. Director, NBRI reserves the right to accept or reject the proposal(s) of any party either in part or in full without assigning any reason thereof.

Stores & Purchase Officer

**SPECIFICATION / SCHEDULE OF REQUIREMENT FOR HIGH PERFORMANCE COMPUTING (HPC)**

<b>Sr No.</b>	<b>Name of the Item</b>	<b>Qty.</b>
1	Computing Server (As per specification attached as Annexure 1)	1
2	Servers (As per specification attached as Annexure 1)	6
3	48 Port Gigabit Ethernet Switch (As per specification attached as Annexure 1)	1
4	CAT 6 Patch Cord 2 Mtr.	24
5	42U Server Rack with PDU and Standard Accessories (Make Similar to Server)	1
6	1U Rack Mountable TFT Monitor, Keyboard, Mouse and 8 Ports USB KVM Switch & Connecting Cables (Make Similar to Server)	1
7	10 KVA Online UPS at 0.8 Power Factor, with 1Hr. Backup (As per specification attached as Annexure 1)	1
8	42AH UPS Batteries and connection of UPC to High Performance Computing Make : Exide / Quanta / Rocket	120
9	One time implementation and 3 yrs support services on Open Source CentOS Linux and Open Source Scheduler SGE	1
10	Source Code for developing and porting data on Web server; 100000 herbarium specimen images	1
11	Source Code for developing and porting data on Web server; 200000 Plants Geolocation images	1
12	Source Code for developing and porting data on Web server; 50000 records of Molecular data	1

**DETAILED TECHNICAL SPECIFICATION**

SI. No.	Item		Compliance (Yes / No)
1.	<b>High Performance Computing Server</b>		
1.1	Chassis	2 U Rack Mountable	
1.2	CPU	2X Gen9 Intel Xeon E5-2620v3 (2.4GHz/6-Core/15MB/85W) Processor Kit	
1.3	Motherboard	Intel (R) C610 Series Chipset	
1.4	Memory	64GB DIMMS scalable to at least upto 1.5 TB, using DDR4 Load Reduced DIMM (LRDIMM) memory modules should be capable of identifying and reporting whether genuine OEM memory is installed for system reliability.	
1.5	Memory Protection	Advanced ECC with multi-bit error protection and memory online spare mode	
1.6	HDD Bays	Up to 24+2 SFF/12+3 LFF max, HDD/SSD. The drive carrier should have intuitive icon based display along with "DO NOT REMOVE" caution indicator that gets activated automatically in order to avoid data loss/downtime due to wrong drive removal.	
1.7	Optical Drive Bay	One optional optical drive bay to install DVD-ROM or DVD-RW (depending on HDD selection)	
1.8	Optical drive	One DVDRW	
1.9	Hard disk drive	6 nos. of SFF 10K 12G SAS drives: 1.2TB	
1.10	Controller	PCIe 3.0 based 12Gb/s SAS Raid Controller with RAID 0/1/1+0/5/50/6/60/1 Advanced Data Mirroring/10 Advanced Data Mirroring with 2GB battery backed write cache (onboard or in a PCI Express slot) Dual Port FC HBA Along with Fiber Patch Cords	
1.11	Networking Features	Server should support networking cards with below features : (i) 1Gb 4 port network adaptor supporting advanced features such as Large Send offload capability, TCP checksum and segmentation, VLAN tagging, MSI-X, Jumbo frames, IEEE 1588, and virtualization features such as VMware NetQueue and Microsoft VMQ. (ii) 10 Gb 2 port Ethernet adaptor supporting enterprise class features such as VLAN tagging, adaptive interrupt coalescing, MSI-X, NIC teaming (bonding), Receive Side Scaling (RSS), jumbo frames, PXE boot and virtualization features such as VMware NetQueue and Microsoft VMQ. (iii) 10 Gb 2 port adapter providing Ethernet and iSCSI or Fibre Channel Over Ethernet (FCoE) connectivity using Converged Enhanced Ethernet (CEE) standards. This adaptor should support Hardware acceleration and offloads for stateless TCP/IP, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE), Jumbo frames and iSCSI. (iv) 10Gb 2-port provide upto 40Gb bi-directional bandwidth, Converges FCoE or RoCE with LAN traffic on a single 10 GbE wire, Tunnel Offload support for VXLAN and NVGRE, RDMA over Converged Ethernet (RoCE)	
1.12	Interfaces	Serial - 1 Micro SD slot - 1 USB 3.0 support with upto 5 total : 1 front, 2 rear, 2 internal (secure)	
1.13	Bus Slots	Six PCI-Express 3.0 slots, atleast two x16 and four x8 slots	
1.14	Power Supply	Redundant platinum Power Supplies	
1.15	Fans	Redundant hot-plug system fans	
1.16	Graphics	Integrated Matrox G200eH2 video standard with 16MB of Video RAM 1280 x 1024 (32 bpp) 1920 x 1200 (16 bpp)	
1.17	Industry Standard Compliance	ACPI 2.0b Compliant, PCIe 3.0 Compliant PXE Support WOL Support Microsoft (R) Logo certifications USB 3.0 support USB 2.0 Support Energy Star ASHRAE A3/A4 UEFI (Unified Extensible Firmware Interface Forum)	

1.18	Embedded system management	<p>Should support monitoring ongoing management, service alerting, reporting and remote management with embedded Gigabit out of band management port.</p> <p>Server should support configuring and booting securely with industry standard Unified Extensible Firmware.</p> <p>System should support RESTful API integration.</p> <p>System management should support provisioning servers by discovering &amp; deploying 1 to few servers with intelligent provisioning.</p> <p>System should support embedded remote support to transmit hardware events directly to OEM or an authorized partner for automated phone home support.</p>	
1.19	Security	<p>Power-on password                      Serial interface control</p> <p>Administrator's password              UEFI</p> <p>Should also supports directory services integration</p> <p>TPM1.2</p> <p>Should support up to 12 customizable user accounts on out of band management port and SSL encryption.</p>	
1.20	Operating systems & Virtualization Software Support	<p>Microsoft Windows Server              Canonical Ubuntu</p> <p>Red Hat Enterprise Linux (RHEL)        Oracle Solaris</p> <p>VMware    Citrix XenServer</p> <p>SUSE Linux Enterprise Server (SLES)</p>	
1.21	Secure encryption	<p>System should support Encryption of the data on both the internal storage and cache module of the array controllers using encryption keys. Should support local key management for single server and remote key management for central management for enterprise-wide data encryption deployment.</p>	
1.22	Warranty	<p>Server Warranty includes 3 years Parts, 3 Year Labor, 3 Year Onsite support with next business day response.</p>	
1.23	Provisioning	<p>Essential tools, drivers, agents to setup, deploy and maintain the server should be embedded inside the server. There should be a built-in Update manager that can update firmware of system by connecting online.</p>	
1.24	Remote Management	<p>(i) System Remote Management should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication.</p> <p>(ii) Server should have dedicated 1 Gbps remote management port. Remote management port should have 4GB NAND flash with 1 GB available for user access. NAND flash should be used for keeping system logs and downloading firmware from website or internal repository.</p> <p>(iii) Server should support agent less management using the out-of-band remote management port.</p> <p>(iv) The server should support monitoring and recording changes in the server hardware and system configuration. It assists in diagnosing problems and delivering rapid resolution when system failures occur.</p> <p>(v) Applications to access the server remotely using popular hand held devices based on Android or Apple iOS should be available.</p> <p>(vi) Remote console sharing upto 6 users simultaneously during pre-OS and OS runtime operation, Console replay - Console Replay captures and stores for replay the console video during a server's last major fault or boot sequence. Microsoft Terminal Services Integration, 128 bit SSL encryption and Secure Shell Version 2 Support. Should provide support for AES &amp; 3DES on browser. Should provide remote firmware update functionality. Should provide support for Java free graphical remote console.</p> <p>(vii) Should support managing multiple servers as one via</p> <ul style="list-style-type: none"> <li>• Group Power Control</li> <li>• Group Power Capping</li> <li>• Group Firmware Update</li> <li>• Group Configuration</li> <li>• Group Virtual Media</li> <li>• Group License Activation.</li> </ul>	

1.25	Server Management	<p>The Systems Management software should provide Role-based security.</p> <ul style="list-style-type: none"> <li>• Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory &amp; HDD.</li> <li>• Should support automatics event handling that allows configuring policies to notify failures via e-mail, pager or SMS gateway or automatic execution of scripts.</li> <li>• Should provide an online portal that can be accessible from anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a Personalized dashboard to monitor device health, hardware events, and contract &amp; warranty status.</li> <li>• Should provide a visual status of individual devices and device groups.</li> <li>• The portal should be accessible on premise (at customer location - console based) or off premise (using internet).</li> <li>• Should support scheduled execution of OS commands, batch files, scripts and command line apps on remote nodes.</li> <li>• Should be able to perform comprehensive system data collection and enable users to quickly produce detailed inventory reports for managed devices.</li> <li>• Should support the reports to be saved in HTML, CSV or XML format.</li> <li>• Should help to proactively identify out-of-date BIOS, drivers and Server Management agents and enable the remote update of system software/firmware components.</li> <li>• The Server Management Software should be of the same brand as of the server supplier.</li> <li>• Infra Platform / Infra Software to support a variety of different hypervisors, such as VMware, Microsoft Hyper-V, Red Hat KVM and integrity VM.</li> <li>• Solution available to Deploy a fast and easy installation via software appliance delivery mode. With its own OS and Database to provide infra and lifecycle management.</li> <li>• Management Software should support integration with popular virtualization platform management software like vCenter, SCVMM and RedHat RHEV</li> </ul>	
1.26	OS	Windows Server Standard Edition 2012	
2.	<b>Servers</b>		
2.1	Chassis	2 U Rack Mountable	
2.2	CPU	1 No. E5-2620v3 (2.4GHz/6-Core/15MB/85W) Processor Kit	
2.3	Motherboard	Intel (R) C610 Series Chipset	
2.4	Memory	32 GB DIMMS scalable to at least upto 512 GB, using DDR4 Load Reduced DIMM (LRDIMM) memory modules. Should be capable of identifying and reporting whether genuine OEM memory is installed. Each LRDIMM should work at 2133 MHz, 1.2V even after populating all the DIMMs in the channel	
2.5	Memory Protection	Advanced ECC with multi-bit error protection and memory online spare mode	
2.6	HDD Bays	Up to 8 SFF/16 SFF / 8 LFF /12 LFF max, HDD/SSD.	
2.7	Optical Drive Bay	One optional optical drive bay to install DVD-ROM or DVD-RW	
2.8	Hard disk drive	2 nos. of SFF 10K 12G SAS drives: 900 GB	
2.9	Controller	PCIe 3.0 based 12Gb/s SAS Raid Controller with RAID 0/1/1+0/5/50/6/60/1 Advanced Data Mirroring/10 Advanced DAta Mirroring with 2GB battery backed write cache (onboard or in a PCI Express slot) Dual Port FC HBA Along with Fiber Patch Cords	
2.10	Networking Features	Server should support one of the following : (i) 1Gb 2 port network adaptor supporting advanced features such as	

		TCP segmentation offload, VLAN tagging, MSI-X, Jumbo frames, IEEE 1588, and virtualization features such as VMDQ. (ii) 10 Gb 2 port Ethernet adaptor supporting enterprise class features such as VLAN tagging, adaptive interrupt coalescing, MSI-X, NIC teaming (bonding), Receive Side Scaling (RSS), jumbo frames, PXE boot and virtualization features such as VMware NetQueue and Microsoft VMQ.
2.11	Interfaces	Video - 1 Micro SD slot - 1 4 USB ports (standard)
2.12	Bus Slots	Six PCI-Express 3.0 slots
2.13	Power Supply	Redundant Power Supplies (from early 2015)
2.14	Fans	Redundant hot-plug system fans
2.15	Graphics	Integrated Matrox G200 video standard 1280 x 1024 (32 bpp)                      1920 x 1200 (16 bpp)
2.16	Industry Standard Compliance	ACPI 2.0b Compliant                      PCIe 3.0 Compliant PXE Support                                      WOL Support Microsoft (R) Logo certifications      USB 3.0 support ASHRAE A3/A4
2.17	Embedded system management	Should support monitoring ongoing management, service alerting, reporting and remote management with embedded Gigabit out of band management port. Server should support configuring and booting securely with industry standard Unified Extensible Firmware. System should support RESTful API integration. System management should support provisioning servers by discovering & deploying 1 to few servers with intelligent provisioning. System should support embedded remote support to transmit hardware events directly to OEM or an authorized partner for automated phone home support.
2.18	Security	Power-on password                      Serial interface control Administrator's password              TPM1.2 UEFI
2.19	Operating systems & Virtualization Software Support	Microsoft Windows Server              Oracle Solaris Red Hat Enterprise Linux (RHEL)      VMware SUSE Linux Enterprise Server (SLES)
2.20	Secure encryption	System should support Encryption of the data on both the internal storage and cache module of the array controllers using encryption keys. Should support local key management for single server and remote key management for central management for enterprise-wide data encryption deployment.
2.21	Provisioning	Essential tools, drivers, agents to setup, deploy and maintain the server should be embedded inside the server. There should be a built-in Update manager that can update firmware of system by connecting online.
2.22	Remote Management	(i) System Remote Management should support browser based graphical remote console along with Virtual Power button, remote boot using USB/CD/DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using Media/image/folder; It should support server power capping and historical reporting and should have support for multifactor authentication. (ii) Server should have dedicated 1 Gbps remote management port. Remote management port should have 2GB NAND flash. NAND flash should be used for keeping system logs and downloading firmware from website or internal repository. (iii) Server should support agent less management using the out-of-band remote management port. (iv) The server should support monitoring and recording changes in the server hardware and system configuration. It assists in diagnosing problems and delivering rapid resolution when system failures occur. (v) Applications to access the server remotely using popular hand held devices based on Android or Apple iOS should be available. (vi) Remote console sharing upto 6 users simultaneously during pre-OS and OS runtime operation, Console replay - Console Replay captures and stores for replay the console video during a server's last

		<p>major fault or boot sequence. Microsoft Terminal Services Integration, 128 bit SSL encryption and Secure Shell Version 2 Support. Should provide support for AES &amp; 3DES on browser. Should provide remote firmware update functionality. Should provide support for Java free graphical remote console.</p> <p>7. Should support managing multiple servers as one via :</p> <p style="text-align: center;">Group Power Control      Group Power Capping Group Firmware Update    Group Configuration Group Virtual Media      Group License Activation.</p>
2.23	Server Management	<p>The Systems Management software should provide Role-based security.</p> <ul style="list-style-type: none"> <li>• Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory &amp; HDD.</li> <li>• Should support automatics event handling that allows configuring policies to notify failures via e-mail, pager or SMS gateway or automatic execution of scripts.</li> <li>• Should provide an online portal that can be accessible from anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a Personalized dashboard to monitor device health, hardware events, and contract &amp; warranty status.</li> <li>• Should provide a visual status of individual devices and device groups.</li> <li>• The portal should be accessible on premise (at customer location - console based) or off premise (using internet).</li> <li>• Should support scheduled execution of OS commands, batch files, scripts and command line apps on remote nodes.</li> <li>• Should be able to perform comprehensive system data collection and enable users to quickly produce detailed inventory reports for managed devices.</li> <li>• Should support the reports to be saved in HTML, CSV or XML format.</li> <li>• Should help to proactively identify out-of-date BIOS, drivers and Server Management agents and enable the remote update of system software/firmware components.</li> <li>• The Server Management Software should be of the same brand as of the server supplier.</li> <li>• Infra Platform / Infra Software to support a variety of different hypervisors, such as VMware, Microsoft Hyper-V, Red Hat KVM and integrity VM.</li> <li>• Solution available to Deploy a fast and easy installation via software appliance delivery mode. With its own OS and Database to provide infra and lifecycle management.</li> <li>• Management Software should support integration with popular virtualization platform management software like vCenter, SCVMM and RedHat RHEV</li> </ul>
2.24	Operating System	<p>2 Nos. Servers with Windows Server Standard Edition 2012 with 400 Nos windows CAL 2 Nos. Microsoft Exchange Server with 400 Nos. User CAL 4 Nos, Servers with Bio Linux software</p>
3.	<b>48 Port Gigabit Switch</b>	
3.1	Key Features	<ul style="list-style-type: none"> <li>• Customized operating using intuitive Web interface.</li> <li>• Layer 3 static routing with 32 routes for network segmentation and expansion.</li> <li>• Access control lists for granular security control.</li> <li>• Spanning Tree : STP, RSTP and MSTP</li> <li>• Limited Lifetime warranty</li> </ul>
3.2	Performance	<p>100 Mb Latency &lt; 5μs, 1000 Mb Latency &lt; 5μs, throughput 70 Mpps (64 byte packets), Routing / Switching capacity 100 Gbps, Routing table size 32 entries (IPv4), 32 entries (IPv6) MAC address table size 16 K entries.</p>
3.3	Memory & Processor	<p>32 MB flash, 128 MB SDRAM</p>

3.4	Management	<ul style="list-style-type: none"> <li>• Simple Web Management allow for easy management of the switch - even by nontechnical users -- through an intuitive Web GUI; supports HTTP and HTTP Secure (HTTPS)</li> <li>• Single IP management enables management of up to 32 switches using a single Web interface; simplifies management of multiple devices.</li> </ul>
3.5	Overview	<ul style="list-style-type: none"> <li>• SNMPv1, v2c and v3 facilitates management of the switch, as the device can be discovered &amp; monitored from an SNMP management station.</li> <li>• Management Security restricts access to critical configuration commands; offers multiple privilege levels with password protection; ACLs provide Telnet and SNMP access; local &amp; remote syslog capabilities allow logging of all access.</li> <li>• Complete session logging provides detailed information for problem identification and resolution.</li> <li>• Port mirroring enables traffic on a port to be simultaneously sent to a network analyzer for monitoring.</li> <li>• Dual flash images provides independent primary and secondary operation system files for backup while upgrading.</li> <li>• Network Time Protocol (NTP) synchronizes timekeeping among distributed time servers and clients; keeps time keeping consistent among all clock - dependent devices within the network so that the devices can provide diverse applications based on the consistent time.</li> <li>• Limited CLI enables users to quickly deploy and troubleshoot devices in the network.</li> <li>• Default DHCP client mode allows the switch to be directly connected to a network, enabling plug &amp; play operation; in absence of a DHCP server on the network, the switch will fall back to a unique static address determined by the switch's MAC address.</li> <li>• FTP, TFTP and SFTP support offers different mechanisms for configuration updates; FTP allows bidirectional transfers over a TCP/IP network; trivial FTP (TFTP) is a simpler method using User Datagram Protocol (UDP); Secure File Transfer Protocol (SFTP) runs over an SSH tunnel to provide additional security.</li> <li>• Remote monitoring (RMON) uses standard SNMP to monitor essential network functions; supports events, alarm, history, and statistics group plus a private alarm extension group.</li> </ul>
3.6	Quality of Service (QoS)	<ul style="list-style-type: none"> <li>• Traffic prioritization provides time-sensitive packets (like VoIP and video) with priority over other traffic based on DSCP or IEEE 802.1p classification; packets are mapped to eight hardware queues for more effective throughput.</li> <li>• IEEE 802.1p/Q delivers data to devices based on the priority and type of traffic; supports IEEE 802.1Q</li> <li>• Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ</li> <li>• Broadcast control allows limitation of broadcast traffic rate to cut down on unwanted network broadcast traffic.</li> <li>• Advanced classifier based QoS classifies traffic using multiple match criteria based on Layer 2, 3 and 4 information; applies QoS policies such as setting priority level and rate limit to selected traffic on a per-port basis.</li> <li>• Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums</li> <li>• Powerful QoS feature supports the following congestion actions: strict priority queuing (SP), weighted round robin (WRR) queuing, and SP+WRR</li> </ul>
3.7	IPv6 Overview	<ul style="list-style-type: none"> <li>• IPv6 host enables switches to be managed and deployed at the IPv6 network's edge.</li> <li>• IPv6 routing supports IPv6 static routes</li> <li>• MLD snooping forwards IPv6 multicast traffic to the appropriate interface preventing traffic flooding.</li> <li>• IPv6 ACL/QoS supports ACL and QoS for IPv6 network traffic.</li> <li>• IEEE 802.3X flow control provides a flow throttling mechanism propagated through the network to prevent packet loss at a congested node.</li> <li>• IEEE 802.3at Power over Ethernet (PoE+) provides upto 30 W per port, which allows support of the latest PoE+ capable devices such as IP phones, wireless access points and security cameras, as well as</li> </ul>



		<ul style="list-style-type: none"> <li>any IEEE 802.3af</li> <li>Compliant end device; lowers the cost of additional electrical cabling and circuits that would otherwise be necessary in IP phone and WLAN deployments.</li> <li>Cable diagnostics detects cable issues remotely using a browser-based tool.</li> <li>Flow control provides back pressure using standard IEEE 802.3x, reducing congestion in heavy traffic situations.</li> <li>Auto MDI/MDI-X adjusts automatically for straight-through or crossover cables on all 10/100/1000 ports.</li> </ul>
3.8	Security	<ul style="list-style-type: none"> <li>Advanced access control lists (ACLs) enables network traffic filtering and enhances network control using MAC and IP based ACLs; time-based ACLs allow for greater flexibility with managing network access.</li> <li>IEEE 802.1X and RADIUS network logins controls port - based access for authentication and accountability.</li> <li>Secure Socket Layer (SSL) encrypts all HTTP traffic, allowing safe access to the browser - based management GUI in the switch.</li> <li>Port isolation : The port isolation feature isolates Layer 2 traffic for data privacy &amp; security without using VLANs. This feature can also be used to isolate the hosts in a VLAN from one another.</li> <li>Port Security combines and extends IEEE 802.1X and MAC authentication to provide MAC - based network access control.</li> <li>ARP attack protection : The ARP detecting feature enables access devices to block ARP packets from unauthorized clients to prevent user spoofing and gateway spoofing attacks.</li> <li>Automatic VLAN assignment assigns users automatically to the appropriate VLAN based on their identity, location &amp; time of day.</li> <li>STP BPDU port protection block Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks.</li> <li>STP root guard protects the root bridge from malicious attacks or configuration mistakes. Automatic denial of service protection monitors for malicious attacks and protects the network by blocking the attacks.</li> <li>Management passwords provides security so that only authorized access to the Web browser interface is allowed.</li> </ul>
3.9	Performance	<ul style="list-style-type: none"> <li>Half &amp; Full duplex auto negotiating capability on every port doubles the throughput on every port.</li> <li>Selectable queue configurations allows for increased performance by selecting the number of queues and associated memory buffering that best meet the requirements of the network applications.</li> <li>IGMP snooping improves network performance through multicast filtering, instead of flooding traffic of all ports.</li> <li>Fiber uplink provides greater distance connectivity using Gigabit Ethernet fiber uplinks.</li> </ul>
3.10	Layer Switching 2	<ul style="list-style-type: none"> <li>Spanning Tree Protocol (STP) supports standard IEEE 802.1 D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP).</li> <li>BPDU filtering drops BPDU packets when STP is enabled globally but disabled on a specific port.</li> <li>Jumbo frame supports upto 10 kilobyte frame size to improve the performance of large data transfers.</li> <li>VLAN support and tagging supports IEEE 802.1Q with 4,094 simultaneous VLAN IDs.</li> </ul>
3.11	Layer services 3	<ul style="list-style-type: none"> <li>Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARTPs; gratuitous ARP allows detecting of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network.</li> <li>DHCP relay simplifies management of DHCP addresses in networks with multiple subnets.</li> </ul>
3.12	Layer Routing 3	<ul style="list-style-type: none"> <li>Static IPv4/IPv6 routing provides basic routing (supporting upto 32 static routes and 8 virtual VLAN interfaces); allows manual routing configuration.</li> </ul>
3.13	Additional information	<ul style="list-style-type: none"> <li>Green initiative support provides support for RoHS and WEEE regulations.</li> <li>Green IT &amp; power improves energy efficiency through the use of the latest advances in silicon development; shuts off unused ports and utilizes variable.</li> <li>Speed fans, reducing energy costs.</li> </ul>

		<ul style="list-style-type: none"> <li>Energy Efficient Ethernet Compliant with IEEE 802.3az standard requirements to save energy during periods of low data activity.</li> </ul>
4.	CAT 6 Patch Cord 2 Mtr.	
5.	42 U Server Rack with PDU and Standard Accessories (Make Similar to Server)	
6.	1U Rack Mountable TFT Monitor, Keyboard, Mouse and 8 ports USB KVM Switch & Connecting Cables (Make Similar to Server)	
7.	<b>10 KVA UPS with 1 Hr Battery Backup</b>	
7.1	Input Parameters	<ul style="list-style-type: none"> <li>Input voltage : 415 V; 3 Phase - 4 wire; 1 Phase - 3 wire</li> <li>Voltage Range : +25%; -30%</li> <li>Frequency : 50 Hz</li> <li>Frequency Range - + 10%</li> <li>Power Factor : 0.8</li> </ul>
7.2	Output Parameters	<ul style="list-style-type: none"> <li>Capacity 10 KVA/8KW</li> <li>Power Factor : 0.8</li> <li>Configuration : 220, 230 &amp; 240 Volts (Selectable)</li> <li>Output Voltage : + 1%</li> <li>Voltage Regulation : +1%</li> <li>Operation with reverse phase sequence : Possible</li> <li>Frequency : 50 Hz.</li> <li>Parallel Redundancy : Compatible for N + 1 Redundancy</li> <li>Output Voltage Distortion : &lt;2% Non Linear Load; &lt;3% Linear Load</li> </ul>
7.3	Bypass	<ul style="list-style-type: none"> <li>Voltage : 220, 230 &amp; 240 Volts</li> <li>Frequency : 50 Hz</li> <li>Isolation : Isolation Transformer is inbuilt at the OUTPUT of the UPS.</li> <li>Type : VRLA</li> <li>No. of battery blocks : 52 Nos.</li> </ul>
7.4	Environmental Parameters	<ul style="list-style-type: none"> <li>Operating Temperature : 0°C to 45°C</li> <li>Storage Temperature : 0°C to 70°C</li> <li>Relative Humidity : 95% RH</li> <li>Altitude : 1000 Meters</li> <li>Certification : CE</li> </ul>
7.5	Mechanical Parameters	<ul style="list-style-type: none"> <li>Height x Width x Depth (mm) : 435 x 630 x 85</li> <li>Weight : 25 Kg.</li> <li>Ventilation : Forced - Air Cooled</li> <li>Cable Entry : Backside</li> <li>Color / Panel Finish : G104</li> <li>Base castor wheels : No</li> <li>Protection : IP21</li> </ul>
7.6	Display	<ul style="list-style-type: none"> <li>LED/LCD</li> </ul>
7.7	Switching Frequency	<ul style="list-style-type: none"> <li>Rectifier : 40 KHz</li> <li>Inverter : 20 KHz</li> </ul>
7.8	Certification	<ul style="list-style-type: none"> <li>CE</li> </ul>
7.9	Warranty	<ul style="list-style-type: none"> <li>3 years on site comprehensive warranty on UPS &amp; 2 years warranty on batteries.</li> </ul>
8	42AH UPS Batteries and connection of UPC to High Performance Computing Make : Exide / Quanta / Rocket	
9	One time implementation and 3 yrs support services on Open Source CentOS Linux and Open Source Scheduler SGE	
10	Source Code for developing and porting data on Web server; 100000 herbarium specimen images	
11	Source Code for developing and porting data on Web server; 200000 Plants Geolocation images	
12	Source Code for developing and porting data on Web server; 50000 records of Molecular data	

## **SPECIAL TERMS & CONDITIONS**

1. Bidder/OEM must have their 24x7 support center in India. Details for the same must be given along with bid document.
2. Bidder's annual turnover must be at least Rs. 10.0 crores during each of the last 3 financial years.
3. Bidder must submit the MAF from the OEM of Server & Storage for participating in the bid and support commitment from OEM for the warranty period.
4. The firm/company should be ISO 9001 certified (Maintenance & Systems Integration). A copy of the certificate must be attached, otherwise the bid will be considered as non-responsive.
5. All Servers and Storage quoted should be from single OEM. Make and Model must be clearly mentioned in the technical bid. If they are not found in the technical bid, the bid will be considered as non-responsive.
6. Bidder or his OEM should not be blacklisted or banned by any Department of Government of India or Abroad. Otherwise Bid will be considered as non-responsive bid. Suitable necessary action will be taken for any concealment of the fact in this regard.

**SPECIFICATION / SCHEDULE OF REQUIREMENT FOR UPGRADE OF 10G LINKS OF EXISTING LAN NETWORK :**

Sl. No.	Item	Description	Qty
	<b>Upgrade for 10G links of Existing LAN network</b>		
1	<b>Core Switch</b>	Switch with two Supervisor, Dual power supply and upto 16 port 10Gbe and OFC modules Upgrade of existing Core Switch for upto 16 port 10Gbe and OFC modules SFP 10 G Module (as per specification attached in Annexure 1)	1 1 1
2	<b>Switch 10 G</b>	Switch Catalyst 24 GigE, and 2 port 10G and OFC modules (as per specification attached in Annexure 1)	4
3	<b>Switch</b>	Switch L2 , with 24 port UTP Giga (as per specification attached in Annexure 1)	10
4	<b>Porting</b>	Porting of data web Server 100000 herbarium specimen	1
5.	<b>Porting</b>	Porting of data web Server 200000 records of plants of India	1
6.	<b>Porting</b>	Porting of data web Server 50000 legumes	1
7.	<b>Porting</b>	Porting of data web Server 50000 IBGN	1

**DETAILED TECHNICAL SPECIFICATION**

Sl. No.	Item		Compliance
1 a)	<b>Core Switch:</b> Switch with two supervisor, Dual Power Supply and upto 16 port 10 Gbe and OFC modules		
1.1	Total number of slots	10	
1.2	Line-card slots	8	
1.3	Type:	Expansion slot	
1.4	Supervisor engine slots	2	
1.5	Dedicated supervisor engine slot numbers	5 and 6	
1.6	Supervisor engine redundancy	Yes	
1.7	Supervisor engines supported	Supervisor Engines	
1.8	Maximum PoE per slot	1500W slots 1 and 2; 750W slots 3, 4, and 7-10	
1.9	Bandwidth scalability per line-card slot	Up to 48 Gbps on all slots 5	
1.10	Number of power supply bays	2	
1.11	AC input power	Yes	
1.12	DC input power	Yes	
1.13	Integrated PoE	Yes	
	<b>Networking</b>		
1.14	Form Factor:	Rack-mountable	
1.15	Subcategory:	Network hubs and switches	
	<b>Miscellaneous</b>		
1.16	Compliant Standards:	ACA TS001 , AS/NZ 3548 Class A , AS/NZS 3260 , CISPR 22 Class A , CS-03 , CSA 22.2 No. 60950 , EN 60950 , EN 61000-3-2 , EN 61000-3-3 , EN 61000-6-1 , EN50082-1 , EN55022 , EN55022 Class A , EN55024 , FCC CFR47 Part 15 , FCC Class A certified , FCC Part 68 , ICES-003 Class A , IEC 60950 , JATE , NEBS level 3 , UL 60950 , VCCI Class A ITE	
b)	<b>Line Card</b> : Upgrade of existing core switch for upto 16 port 10Gbe and OFC Modules		
1.1	Device Type	Switch - 6 ports Up to 6 ports 10GE X2 or 12 ports GE SFP with TwinGig Converter Module TwinGig modules must be used in groups of three: ports 1-3 or ports 4-6	
1.2	Enclosure Type	Plug-in module	
1.3	Subtype	10 Gigabit Ethernet 10GBASE-X (X2) and 1GBASE-X (SFP)	
1.4	Compatible Slots	1 x Expansion Slot	
1.5	Jumbo Frame Support	L2-4 Jumbo Frame support (up to 9216 bytes)	
1.6	Ports	6 x X2	
1.7	Performance	Up to 24 Gbps switching capacity	
1.8	Features	Full duplex mode, Jumbo Frames support	
	<b>Miscellaneous</b>		
1.9	Compliant Standards	NEBS level 3, ETSI, CISPR 22 Class A, EN 60950, IEC 950, UL1950, VCCI ClassA ITE, EN55024, EN55022 Class A, CSA 22.2 No. 60950, AS/NZS 3548, FCC Part 15 A	
	<b>Compatibility Information</b>		
1.10	Designed For	Cisco Catalyst 4503-E, 4506-E, 4507R-E, 4510R-E, Cisco catalyst WS-X4606-X2-E line-card is designed for high-speed backbone and switch-to-switch applications. Integrated 6 ports 10GB X2 or 12 ports 1 GE SFP with Twin Gig Converter Module, the ports can be used interchangeably as Gigabit Ethernet and 10 Gigabit Ethernet to support phased migration from Gigabit Ethernet to 10 Gigabit Ethernet	

c)	<b>SFP 10 G Module</b>		
1.1	Form Factor	SFP+	
1.2	Device Type	Transceiver module	
1.3	Interface (Bus) Type	Plug-in module	
1.4	Connectivity Technology	Wired	
1.5	Application	10GBASE-LR	
1.6	Data Transfer Rate	10 Gbps	
1.7	Wavelength	1310nm	
1.8	Max Distance	10km	
1.9	Fiber Type	SMF	
1.10	Connector	Duplex LC	
1.11	Features	<p>Supports 10GBASE Ethernet and OTU2/OTU2e</p> <p>Hot-swappable input/output device that plugs into an Ethernet SFP+ port of a Cisco switch</p> <p>Provides flexibility of interface choice</p> <p>Supports pay-as-you-populate+model</p> <p>Supports digital optical monitoring capability should be same make as OEM of Switch</p> <p>Optical interoperability with 10GBASE XENPAK, 10GBASE X2, and 10GBASE XFP interfaces on the same line</p>	
2.	<b>Distribution Switch :</b> Switch Catalyst 24 GigE, 2 Port 10G and OFC modules		
2.1	Device Type	Switch - 24 ports - Managed	
2.2	Enclosure Type	Rack-mountable - 1U	
2.3	Ports	24 x 10/100/1000 + 2 x 10 Gigabit SFP+	
2.4	Power Over Ethernet (PoE)	Yes	
2.5	Performance	Switching capacity : 176 Gbps Forwarding performance (64-byte packet size) : 65.5 Mpps	
2.6	MAC Address Table Size	8K entries	
2.7	Remote Management Protocol	SNMP 1, SNMP 2, RMON 1, RMON 2, RMON 3, RMON 9, Telnet, SNMP 3, SNMP 2c, HTTP, HTTPS, TFTP, SSH	
2.8	Encryption Algorithm	SSL	
2.9	Authentication Method	Secure Shell (SSH), RADIUS, TACACS+	
2.10	Features	<p>Layer 2 switching, auto-sensing per device, dynamic IP address assignment , auto-negotiation, BOOTP support, ARP support, load balancing, VLAN support, auto-uplink (auto MDI/MDI-X), IGMP snooping, Syslog support, DiffServ support, Broadcast Storm Control, IPv6 support, Multicast Storm Control, Unicast Storm Control, Rapid Spanning Tree Protocol (RSTP) support, Multiple Spanning Tree Protocol (MSTP) support, DHCP snooping, Dynamic Trunking Protocol (DTP) support, Port Aggregation Protocol (PAgP) support, Access Control List (ACL) support, Quality of Service (QoS), Link Aggregation Control Protocol (LACP), Port Security, MAC Address Notification, Remote Switch Port Analyzer (RSPAN)</p>	
2.11	Compliant Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3z, IEEE 802.1D, IEEE 802.1Q, IEEE 802.3ab, IEEE 802.1p, IEEE 802.3x, IEEE 802.3ad (LACP), IEEE 802.1w, IEEE 802.1x, IEEE 802.1s, IEEE 802.3ah, IEEE 802.1ab (LLDP)	
2.12	RAM	128 MB	
2.13	Flash Memory	64 MB Flash	
2.14	Status Indicators	Port status, link activity, port transmission speed, port duplex mode, power, system	
	<b>Expansion/Connectivity</b>		
2.15	Interfaces	<p>24 x 10Base-T/100Base-TX/1000Base-T - RJ-45</p> <p>USB : 1 x 4 PIN USB Type A</p> <p>1 x console - mini-USB Type B - management</p> <p>1 x console - RJ-45 - management</p> <p>1 x 10Base-T/100Base-TX - RJ-45 - management</p> <p>2 x SFP+</p>	

2.16	Expansion Slot(s)	1 (total) / 1 (free) x Stacking Module	
	<b>Power</b>		
2.17	Power Device	Power supply - internal	
2.18	Voltage Required	AC 120/230 V ( 50/60 Hz )	
2.19	Power Consumption Operational	39 Watt	
	<b>Miscellaneous</b>		
2.20	MTBF	332,958 hour(s)	
2.21	Compliant Standards	TUV GS, CISPR 22 Class A, GOST, BSMI CNS 13438 Class A, CISPR 24, NOM, VCCI Class A ITE, EN55024, CB, EMC, MIC, IEC 60950-1, EN 60950-1, UL 60950-1 Second Edition, RoHS, CSA C22.2 No. 60950-1, FCC Part 15 B Class A	
3.	<b>Edge Switch</b> : Switch L2 with 24 port UTP Giga		
3.1	Subtype	Gigabit Ethernet	
3.2	Ports	24 x 10/100/1000 + 2 x SFP	
3.3	Performance	Switching capacity : 50 Gbps Forwarding performance (64-byte packet size) : 38.7Mpps	
3.4	MAC Address Table Size	8K entries	
3.5	Jumbo Frame Support	9216 bytes	
3.6	Routing Protocol	IGMP	
3.7	Remote Management Protocol	SNMP 1, SNMP 2, RMON 1, RMON 2, Telnet, SNMP 3, SNMP 2c, HTTP, HTTPS, TFTP, SSH-2	
3.8	Encryption Algorithm	SSL	
3.9	Authentication Method	RADIUS, TACACS+, Secure Shell v.2 (SSH2)	
3.10	Features	Layer 2 switching, auto-sensing per device, DHCP support, auto-negotiation, BOOTP support, VLAN support, auto-uplink (auto MDI/MDI-X), IGMP snooping, Syslog support, Diff Serv support, Broadcast Storm Control, Multicast Storm Control, Unicast Storm Control, Rapid Spanning Tree Protocol (RSTP) support, Multiple Spanning Tree Protocol (MSTP) support, Dynamic Trunking Protocol (DTP) support, Port Aggregation Protocol (PAgP) support, Quality of Service (QoS), Link Aggregation Control Protocol (LACP), Port Security, MAC Address Notification	
3.11	Compliant Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3z, IEEE 802.1D, IEEE 802.1Q, IEEE 802.3ab, IEEE 802.1p, IEEE 802.3x, IEEE 802.3ad (LACP), IEEE 802.1w, IEEE 802.1x, IEEE 802.1s, IEEE 802.3ah, IEEE 802.1ab (LLDP)	
3.12	RAM	128 MB	
3.13	Flash Memory	64 MB Flash	
3.14	Status Indicators	Port status, link activity, port transmission speed, port duplex mode, power, system	
	<b>Miscellaneous</b>		
3.15	Rack Mounting Kit	Optional	
3.16	MTBF	335,014 hours	
3.17	Compliant Standards	TUV GS, CISPR 22 Class A, GOST, BSMI CNS 13438 Class A, CISPR 24, NOM, EN55024, CB, EMC, MIC, IEC 60950-1, EN 60950-1, UL 60950-1 Second Edition, RoHS, CSA C22.2 No. 60950-1, FCC Part 15 B Class A	
3.18	Features	Redundant Power System (RPS) connector	
	<b>Expansion / Connectivity</b>		
3.19	Interfaces	24 x 10Base-T/100Base-TX/1000Base-T - RJ-45 2 x SFP (mini-GBIC) 1 x console - mini-USB Type B - management 1 x console - RJ-45 - management 1 x 10Base-T/100Base-TX - RJ-45 - management 1 x USB - Type A	
4.	Porting of data web Server 100000 herbarium specimen		
5.	Porting of data web Server 200000 records of plants of India		
6.	Porting of data web Server 50000 legumes		
7.	Porting of data web Server 50000 IBGN		

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