**Items Requirements and Technical Specifications**

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| **Items For the Procurement** |
| **SL.no** | **Items**  | **Qty** |
| 1 | Workstations with Monitors, Keyboard and Mouse | 9 |
| 2 | 10 G Switch | 1 |
| 3 | Unified NAS Storage System-120TB | 1 |
| 4 | Server | 1 |
| 5 | 24U or higher Server Rack | 1 |
| 6 | 10G Patch Cords- Cat 6 Cables | 10 |
| 7 | System Backup Licenses  | 10 |
| 8 | Apple MacBook Pro 13 inch | 1 |
| 9 | Printers | 3 |

**1. Workstations : Technical Specification**

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| **Features required** | **Specification** | **compliance(Yes/No)** | **Remarks** |
| Processor(s) | Intel make Scalable architecture based processor W2155 (10C, 3.3Ghz,13.75M Cache) |   |   |
| Chipset | Intel C400 series Chipset |   |   |
| RAM | 32GB DDRW4-2666 RDIMM/LRDIMM (Max 512GB, at least 8 DIMMs) |   |   |
| RAID | SATA3 controller with RAID 0, 1, 5, 10 |   |   |
| HDD/SSD(s) | 2 x 4TB SATA Enterprise 7.2K RPM HDDs |   |   |
| HDD Bays | 8 HDD/SSD Drive bays supporting HDD and SSDs , with 4 Hot Swap bays or more |   |   |
| OS Boot | 1 x 256GB NVMe M.2 boot device must be in built / supplied |   |   |
| ODD | 16x or better DVDRW Drive |   |   |
| GPU Card | 1 x Nvidia Quadro P2000 Graphics card with dedicated 5GB memory and dual monitor support |   |   |
|   | Support for Dual Double Width GPGPU controllers in the same configuration |   |   |
| NIC | 1 x 1G LAN and 1 x 5G/10G ports or higher thru AOC or thru on board controller |   |   |
| Audio | on board thru HD controller |   |   |
| Exp Slots(s) | 3 PCI-E 3.0 x16 slots (support for two double width GPU controllers from day one) |   |   |
| 1 PCI-E 3.0 x4, |   |   |
| M.2 Interface and U.2 Interface dedicated slots on board |   |   |
| Ports | At least 8 USB 3.0 Ports (at least 2 in front) , 2 x LAN ports |   |   |
| Diagnostics | Thru Power, HDD , Network and System Info LEDs |   |   |
| Monitoring | Out of band system health monitoring thru integrated IPMI controller |   |   |
| Chassis | Mid-Tower/Tower form factor designed with Liquid Cooling Technology only |   |   |
| P. Supply | High Efficient 500W or higher power supply with capability to support at least two  |   |   |
|   | double width GPU |   |   |
| Compliance | Bureau of Indian Standards Certified (Attach Certificate), IS13252 Certified (attach report) |   |   |
| Certification | RHEL/SUSE, Microsoft (Cent OS/Fedora/Debian) Certified System (Attach Certificates) |   |   |
| Peripherals | USB KBD, Mouse, 24" LED Monitor |   |   |
| Warranty | 3 Years Onsite Comprehensive Warranty |   |   |

 **2. 10G Ethernet Switch: Technical Specification**

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| **Features required** | **Specification** | **compliance (Yes/No)** | **Remarks** |
| Ports | 48 Port 10GBase-T Ethernet -RJ-45 ports  |   |   |
|   | 2 x One-Gigabit Ethernet ports -RJ45 Connectors, Out-of-band RS-232 Management port |   |   |
| Management | Web-based management interface (Internally Managed Switch) |   |   |
| Power Supplies | Redundant Power Supplies  |   |   |
| Cables | Required no. of cables to be supplied for connectivity with End computing systems |   |   |
|   | Storage System and SMP Server |   |   |
| Rack Mount Kit | Any accessory including Rack mount kit etc must be supplied with the switch |   |   |
| Warranty | 3 Years Comprehensive Warranty |   |   |

**3. Unified NAS Storage System-120TB: Technical Specification**

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| **Features required** | **Specification** | **compliance (Yes/No)** | **Remarks** |
| Controller | Unified NAS Storage System. Each processor per-controller with at least a Xeon Processor (kindly specifiy) |   |   |
| Controller Cache | The system with minimum 2GB battery backed cache or more across the controller with an ability to protect data on cache if the system fails and it results into controller failure. The cache on the storage should have battery backup. Cache shall be dynamically managed for both Read and Write operations. |   |   |
| Storage Operating System | The Storage will have embedded Operating Systems and there should be only one OS to provide the required Protocols. (It will not be a general purpose OS such as Windows, Linux etc.) The OS of the same make as that of storage or as per OEM standard. |   |   |
| Protocol | Storage OS will Support iSCSI and/or FC protocol and/or SAS. The Proposed Storage Should be capable of direct host connectivity. And must support SMB/CIFS, NFS, FTP, NFSoverRDMA for file storage purpose and iSCSI, SRP for block storage connectivity |   |   |
| Storage to Host Connectivity | 2 x Hi Speed 10Gbps(RJ-45) Interconnect using low latency 10G interconnect for storage connectivity. Storage with FC (16G) Controller and Infiniband Dual Port Controller (56Gbps) available as well from day one. ICGEB may decide for connecting systems using IB , FC controller |   |   |
| Storage Capacity | At least 36 hot-swap SAS/SATA internal HDD bays, out of which 30 bays to be populated with 4 TB 7200 rpm SAS drives each. The system must support future expansion of storage upto 192 drives.  |   |   |
| Redundancy | There should be complete Redundancy at the data storage level and hot swappable disks for easy operations |   |   |
| RAID Support | The solution to be configured with RAID 6 or equivalent protection and for every 10 disks, 1 disk should be configured as Global hot spare. |   |   |
| Storage Feature | Storage system (disk shelves) should support SSD/ SATA/ NL-SAS/ SAS disks simultaneously with different rpm. Storage back end connectivity should be at least 6Gbps SAS Ports (for optional connectivity) |   |   |
| Storage Disks Types | SAS, NL-SAS and SSD drives to be support |   |   |
| Storage Management | Should have Single Graphic Use Interface (GUI) for both File and Block as well as command line interfacing. Must include real time performance monitoring tools giving information on CPU utilization, volume throughput, I/O rate and latency etc. |   |   |
| User License | Storage must support unlimited user license |   |   |
| Host / Server OS Support | RedHAT Linux, MS Windows etc. |   |   |
| Regulatory Compliance | Storage OEM and the product must be BIS Listed and Certified |   |   |
| Warranty | 3yrs onsite comprehensive warranty |   |   |

**4. Server : Technical Specification**

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| **Features required** | **Specification** | **compliance (Yes/No)** | **Remarks** |
| Processor(s)   | 2 x Intel® Xeon procs -from Skylake generation with 20 Cores operating at 2.4Ghz  |   |   |
| with at least 2 x FMU unit or more. OEM must confirm to the peak performance of at least 3072 |   |   |
| Gigaflops with a sustained deliverable perf of 60% or more using HPL benchmark |   |   |
| RAM | 256GB DDR4-2666 ECC RDIMM (expandable to Max 2TB, at least 16 DIMMs) |   |   |
| HDD(s) | 4 x 4000GB, 7200 RPM, Enterprise SATA HDD, 1 x 480GB SATA Enterprise Grade SSD –with 2DWPD Endurance rating. (with 16 Hot Swap HDD Bays for HDDs and SSDs) |   |   |
|  and on board controller for NVMe SSDs- to populate 4 x NVMe SSDs (dedicated bays must be present) |   |   |
| (Note : NVMe controller is needed and not M.2 ports) |   |   |
| NIC | 2 x Gigabit(10/100/1000Mbps) Ethernet ports on-board minimum |   |   |
| GPU | 1 x Tesla V100 32GB GPGPU, available slots for populating additional 3 Tesla GPUs or GTX 2080 GPUs in future. OEM must confirm for the support for the same. |   |   |
| Exp Slot(s) | at least 6 x PCI-Express x16 (for 4 Double Width GPU Cards) and 2 x PCI-Express x8 slots for other add on cards |   |   |
| Interconnect | Low Latency 2 x Infiniband 56Gbps Interconnect ports or more. Connectivity between Unified Storage system (Item 3 of this RFP ) will be connected with computational system using IB controller as well with NFS over RDMA protocol. |   |   |
| Ports | 4 USB 3.0 ports, 2 x Network (10G RJ-45 ports) ,1 x Video, Ports  |   |   |
| Chassis | Rack Mount (Max 4U or less) |   |   |
| Job Scheduling | Unified system management/monitoring toolset for configuration, diagnosis and management of the system. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customize the node, And tool set with provisioning, monitoring, and reporting capabilities. With JOB scheduling capabilities on single node for CLI and GUI based end user applications . |   |   |
| S/W utility must be a Commercial Licensed S/W issued in ICGEB's name.  |   |   |
| Management | Out of band Management Capabilities, Centralized Management Console License for the purpose of health monitoring , power management and firmware /S/W upgrades & updates. RestFul API to support and integrate server management in to existing management infrastructure.Advanced Power Management capabilities to manage power on heteregenous server products . Remote S/W installation Support.Remote debug assistance directly from OEM product engineers.  |   |   |
| P. Supply | High Efficient Redundant 80PLUS Platinum Certified) power supply , minimum 2000W Power Supplies - N+N Configuration |   |   |
| OS Cert | Microsoft and RHEL/SUSE Certified System. Attach certificate with the bid |   |   |
| Monitoring | Out of Band System Health Monitoring enabled thru on board controller |   |   |
|   | And Tachometer status monitoring equipped system with PWM controller FANs |   |   |
| Compliance | OEM must be registered with Bureau of Indian Standards, IS13252 Standard E-Waste Policy Certified |   |   |
|   | OEM product datasheet must confirm to asked technical specifications |   |   |

**5. Rack : Technical Specification**

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| **24U or higher Server Rack- Qty-1** | **compliance (Yes/No)** | **Remarks** |
| Rack | 1 x 24U or higher Industry Standard Rack with all acessories to house SMP System |  |  |
|   | asked in tender and Unified Storage System |  |  |
| Accessories | Castor Wheels, Front Door (Perforated), Power Distribution Units etc \ |  |  |
|   | must be included in proposal and supplied by bidder |  |  |
|  Warranty | 1. Years Onsite
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**6. 10G Patch Cords- Cat 6 Cables for interconnectivity**

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| --- | --- | --- | --- |
| 10G Cables | Cat 6 Patch Cords of required length must be supplied by bidder to interconnectivity between |  |  |
|   | End User computing system , SMP system and Unified Storage |  |  |
| Ducting | Required ducting for the same is to be done inside the lab by the bidder |  |  |
| Accessories | Any accessory if required to be provided by the bidder as per requirement |  |  |
|  Warranty | 3 Years Onsite  |  |  |

**7. System Backup Licenses**

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| --- | --- | --- | --- |
| Back Up Licenses | Compatible Back Up licenses for Item 1 & Item 4  |  |  |
|   | Policy for System Back up to be an automated policy with periodic back up twice or thrice a day without manual intervention |  |  |
| License Type | Licenses must be perpetual in nature and issued in the name of ICGEB |  |  |
|  | Back up is to be taken on Unified Storage System – Item 3 |  |  |
|  Warranty | 3 Years Onsite (with Perpetual License) |  |  |

**8. Apple MacBook Pro 13 inch**

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| Macbook ProMPXTZHN/A | 13-inch MacBook Pro: 2.3GHz dual-core i5 256 GB |  |  |

**9. Printers**

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| HP LaserJet Pro M403dn | Auto-Duplex & Network: Two | 2 (two) |
| Canon Imageclass MF 633cdw | All-in-one color | 1 (one) |