



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
Materials Management Division
For IIT GOA

High Performance Cluster

Master node: 2 No.

CPU	2 x Intel Xeon G-6148, 20 cores, 40 threads @ 2.4GHz, 27.5 MB L3 Cache
Storage	Dual Controller with SAS ports / 6 x 1.2TB HDD
Chipset	Appropriate chipset with 2 x 600GB 10k SAS
Memory	192 GB DDR4 Registered ECC
RAID	On board or AOC Hardware SAS RAID Controller with RAID levels 0, 1, 5, 10, and 50 supported and at least 1GB cache
Networking	4 x 1GB Ethernet BaseT ports, dedicated remote management port
Interconnect	100Gbps, Non-blocking, Switching Fabric. Infiniband: Single Port IB EDR HCA / dual port 10Gbps Ethernet HBA with transceivers
Chassis	2U rack mountable chassis, compatible with standard 19" 42U rack, Rack mounting kit
Power supply	Redundant hot swap power supply unit, Power supply with 80 PLUS Platinum (or Titanium) compliance
Peripherals	24" Monitor with integrated webcam and microphone, wired keyboard and wired mouse
Graphics	On board graphics
Fans	Redundant hot swap fans
Management	IPMI based monitoring and management
Optical drive	DVD-RW drive

Compute nodes: 24 No.

CPU	2 x Intel Xeon G-6148, 20 cores, 40 threads @ 2.4GHz, 27.5 MB L3 Cache
Storage	1 TB SATA SSD
Chipset	Appropriate chipset with 2 x 600GB 10k SAS
Memory	192 GB DDR4 Registered ECC
RAID	On board or AOC Hardware SAS RAID Controller with RAID levels 0, 1, 5, 10, and 50 supported and at least 1GB cache
Networking	2 x 1Gbps Ethernet
Interconnect	100Gbps, Non-blocking, Switching Fabric. Infiniband: Single Port IB EDR HCA / dual port 10Gbps Ethernet HBA with transceivers
Chassis	1U/2U rack-mountable with sliding rails, rack mounting kit
Power supply	Redundant hot swap power supply unit, Power supply with 80 PLUS Platinum (or Titanium) compliance
Graphics	On board graphics
Fans	Redundant hot swap fans
Management	IPMI based monitoring and management



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Compute node with GPU: 1 No.

CPU	2 x Intel Xeon G-6148, 20 cores, 40 threads @ 2.4GHz, 27.5 MB L3 Cache
Storage	1 TB SATA SSD
Chipset	Appropriate chipset with 2 x 600GB 10k SAS
Memory	192 GB DDR4 Registered ECC
RAID	On board or AOC Hardware SAS RAID Controller with RAID levels 0, 1, 5, 10, and 50 supported and at least 1GB cache
Networking	4 x 1Gbps Ethernet
Interconnect	100Gbps, Non-blocking, Switching Fabric. Infiniband: Single Port IB EDR HCA / dual port 10Gbps Ethernet HBA with transceivers
Chassis	1U/2U rack-mountable with sliding rails, rack mounting kit
Power supply	Redundant hot swap power supply unit, Power supply with 80 PLUS Platinum (or Titanium) compliance
GPU	2 x NVIDIA P100 Graphics cards with 16 GB, and a possibility of adding at least two additional cards
Fans	Redundant hot swap fans
Management	IPMI based monitoring and management

Storage node: 1 No.

CPU	2 x Intel Xeon G-6148, 20 cores, 40 threads @ 2.4GHz, 27.5 MB L3 Cache
Storage	24 x 1.2 TB 10k SAS disks and 16 expansion slots for additional storage
Chipset	Appropriate chipset with 2 x 600GB 10k SAS
Memory	192 GB DDR4 Registered ECC
RAID	On board or AOC Hardware SAS RAID Controller with RAID levels 0, 1, 5, 10, and 50 supported and at least 1GB cache
Networking	4 x 1Gbps Ethernet
Interconnect	100Gbps, Non-blocking, Switching Fabric. Infiniband: Single Port IB EDR HCA / dual port 10Gbps Ethernet HBA with transceivers
Chassis	1U/2U rack-mountable with sliding rails, rack mounting kit
Power supply	Redundant hot swap power supply unit, Power supply with 80 PLUS Platinum (or Titanium) compliance
Graphics	Onboard graphics
Fans	Redundant hot swap fans
Management	IPMI based monitoring and management



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Infiniband EDR Switch: 100 Gbps 36-port infiniband switch with required number of cables to connect masternode, and computing nodes. Should be compatible with OFED (Open Fabric Infiniband stack), OpenSM, OpenMPI. Single chassis mountable in standard 19” rack. Rack mounting kit should be provided. All software/firmware/drivers should be supplied. Appropriate length QSFP Cable to be supplied. Numbers and length should be specified in the quotation.

Gigabit Ethernet Switch: 24 port or higher port 10/100/1000 Mbps Ethernet switch with auto sensing of link speed on all ports 19” rack mountable Appropriate length cables to be provided; numbers and length should be specified in the quotation.

Server Rack: Server rack to accommodate all the nodes and storage with all required accessories. Server rack should be from the same OEM of servers & storage.

UPS: 1 No. 20 KVA (or higher) UPS with at least 20 mins backup for the cluster (another 5 compute nodes should be factored in).

Automatic shutdown: Appropriate software tools to be included in the head node so that the head node automatically shuts everything down on more than 10 mins of power cut. Provisions of automatic shutdown should also be made for excessive rise in temperature.

The OEM/Bidder has to specify the heat dissipation (in BTU) and max power consumption of each component when configured with the above configuration.

Software & Drivers:

1. Operating System: 64-bit Linux OS.
2. Cluster Tools & Job Scheduler: Appropriate software packages should be installed for queue management, and for monitoring the cluster usage data. Configuration of scheduler, queues, and policies should be discussed with any of the contacts above at IIT Goa before installation process.
3. Compilers & Libraries: Open source libraries and compilers, as per the requirement of IIT Goa at the time of indentation, should be installed by the vendor.

Training & Documentation: The vendor should provide sufficient training for the system administrators of IIT Goa. Proper documentation of everything installed and its usage needs to be provided.

Testing: Finally, testing and verification of the complete setup is required.



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The eligibility criteria for participation in bid are mentioned below:

1. The Bidder must be an Original Equipment Manufacturer (OEM) or its Authorized Dealer/Channel Partner having a Direct Purchase and Support agreement with the OEM. In case, the Bidder is a Dealer, a valid LETTER OF AUTHORIZATION from Original Equipment Manufacturer should be produced along the bid. Documentary evidence to this effect must be produced along with technical bid.
2. The bidder should be registered under the Companies Act 1956 or a registered firm. Registration certificate to this effect must be produced. The bidder /OEM must have registered/support office either in Goa, Karnataka, Maharashtra, Tamilnadu, Telangana with well established Service Centre. Documentary evidence to this effect must be produced along with technical bid.
3. In case the bidder is a System Integration Partner of the OEM, a certificate from the OEM clearly stating the relationship and level of partnership with the Partner and authorisation to the Partner to quote for this specific tender enquiry is to be furnished. One OEM can authorise one partner only and one partner can represent only one OEM. Documentary evidence to this effect must be produced along with technical bid.
4. The bidder should have average annual sales turnover of Rs.5 Crores or more during the last three financial years ending 31 st March 2017. Attach firm's last 3 years audited profit and loss Account balance sheet duly audited by C.A. Documentary evidence to this effect must be produced along with financial bid.
5. Bidder must be in existence in the HPC business for at least in the last ten years. Documentary evidence to this effect must be produced along with technical bid.
6. The bidder should ensure that:(i) Access to 24 x7 online support for 5 years from Technical Assistance Center of OEM/bidder for resolution of problems with the help of online tools and technical assistance (ii) Onsite support of minimum of 5 years (ii) Defective part replacement during warranty period (5 years) within 5 working days with Advance Replacement Policy
7. The OEM/Bidder must have an India based support infrastructure by maintaining a local spares depot in the country. This is to ensure immediate delivery of spare parts from OEM to its channel partner/system integrator.
8. Bidder should provide complete documentation about the Rack layout, power, cooling and electrical infrastructure required at IIT Goa along with the technical bid.
9. One Resident Engineer has to be deployed at least for a period of 3 months from the date of installation of HPC at IIT Goa site. The engineer should have sufficient experience in HPC environment and capable of handling all types of call/Queries related to HPC. He should be stationed at IIT Goa on all working days between 9.30Am to 5.00P.M on 6 days a week basis for 3 months as mentioned above. A detailed resume of the Engineer to be provided along with Technical Bid. Further, the engineer has to train the technical staffs of IIT Goa free of charge in order to make them familiar with HPC environment.



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10. Bidder should be registered under GST Act with concerned State Sales Tax Authorities. The bidder should furnish along with the bid document, the relevant GST Registration Document and PAN / TAN copies. Documentary evidence to this effect must be produced along with financial bid.
11. List of Present Clientele to whom identical or similar equipment has been supplied in the preceding three years must be produced with contact addresses & telephone numbers. Documentary evidence to this effect must be produced along with technical bid.
12. The bidder should separately provide an itemized price list for each hardware item, software bundle, service and warranty. This list has to be included with the financial bid.
13. The bidder should quote unit prices for every component. The prices can be in INR or in valid foreign currencies (e.g. US Dollar). GST and any other applicable charges (for example shipping and installation) should be mentioned separately.
14. The bidder should provide a on-site warranty and support of minimum 5 years.
15. IIT Goa has the right to accept the whole or any part of the tender or portion of the quantity offered or reject it in full without assigning any reason.
16. The bidder shall ensure that the bid submitted by him includes all equipment, hard ware and software for full execution of contract to be awarded and cannot charge extra for additional hardware and software items required to meet the operational requirement at the installation and commissioning stage.
17. The quoted price should include the installation and maintenance charges for five years.