

**Tender notification for the procurement of a “CPU+GPU cluster for high performance computing” (Last date: 21/09/201 by 5 PM)**

Dear Sir/Madam,

We wish to purchase a high performance computing cluster comprising of few CPU-only compute nodes and a CPU+GPU compute node for seismic wave propagation and civil engineering applications through an open domestic tendering process. **The minimum peak performance for the CPU-only part of the computing cluster should be 23 TFLOPs.** The detailed list of specifications are given below. Vendors are requested to provide a proposal for this requirement by **21/09/2021 5:00 PM**. The purchase will be completed from the lowest bidder, provided all the technical specifications are met.

Please email any queries regarding this tender to [swethav@iisc.ac.in](mailto:swethav@iisc.ac.in) by **02/09/2021** and the response to the queries will be conveyed to all vendors by **07/09/2021**. Oral communication is discouraged.

**Minimum specifications for each CPU-only node: One among these would be the master node**

S. No	Item	Details
1	Processor	2x Intel Xeon Gold 6248 or better in terms of cores, frequency and cache (or) 2x AMD EPYC Milan 7542 or better in terms of cores, frequency and cache
2	Memory	Minimum 8GB/core DDR4 RDIMMS in balance mode, 2933 MHz or better
3	Storage	<ul style="list-style-type: none"><li>• Minimum 2 TB 6 Gb/s Enterprise SATA HDD on the compute nodes</li><li>• Minimum 32 TB 6 Gb/s Enterprise SATA HDD on the master node. Minimum 6 Bays.</li><li>• Raid controller 8-Port SATA Controller card with minimum 2 GB cache on the master node.</li></ul>
4	Networking	<ul style="list-style-type: none"><li>• 100 Gbps Infiniband adapters and cables</li><li>• Gigabit NIC Ports</li></ul>
5	Redundant power supply	Minimum 80 plus Platinum Efficiency or better

**Minimum specifications for CPU+ GPU compute node: (1 node)**

S. No	Item	Details
1	Processor	2 x Same Intel/AMD processor as the CPU-only compute nodes
2	GPU	Minimum 2x NVIDIA V100 32 GB PCI-e GPUs or better

3	Memory	Minimum 8GB/CPU-core DDR4 RDIMMS in balance mode, 2933 MHz or better
4	Storage	Minimum 2 TB 6 Gb/s Enterprise SATA HDD
5	Networking	<ul style="list-style-type: none"> <li>• 100 Gbps Infiniband adapters and cables</li> <li>• Gigabit NIC Ports</li> </ul>
6	Redundant power supply	Minimum 80 plus Platinum Efficiency or better

**Other specifications:**

S. No	Item	Details
1	Primary Interconnect Switch	Infiniband EDR 100Gbps switch (with at least 24 ports) corresponding to the high speed connectivity adapter used in the master and compute nodes. All drivers of the switch have to be provided to setup the cluster on the latest version of Linux
2	Management Interconnect Switch	Gigabit Ethernet Switch (with at least 24 ports) with low latency
3	Rack	42U Rack. Dimensions and other details of the rack should be specified in the bid.
4	Software	<ul style="list-style-type: none"> <li>• UBUNTU/CentOS recent version</li> <li>• Open source cluster management and monitoring software</li> <li>• Required drivers and toolkit for GPU computing</li> <li>• Open source compilers and tools, libraries required for parallelization, open source mathematical/scientific libraries</li> </ul>
5	Warranty	<ul style="list-style-type: none"> <li>• Minimum three years warranty on all components should be included in the quoted cost.</li> <li>• The warranty cost for two subsequent years should also be mentioned separately.</li> <li>• The warranty period will commence from the date of acceptance of the equipment.</li> <li>• During the warranty period, the bidder shall be fully responsible for the manufacturer's warranty in respect of proper design, quality and workmanship of all the systems supplied.</li> <li>• During the warranty period, the bidder shall attend to all the hardware problems on site and shall replace the defective parts at no extra cost to the purchaser.</li> </ul>

		<ul style="list-style-type: none"> <li>During the warranty period, the preventive maintenance and repairs of the components supplied by the bidder are the responsibilities of the bidder.</li> </ul>
6	Processor type	All nodes should contain processor from one company, i.e., all nodes should either contain Intel processors or AMD processors of the same type
7	Redundant power supply	The entire proposed server solution should have redundant power supply at least platinum level (94%).
8	Cooling	All nodes should have sufficient inbuilt cooling hardware for safe and reliable operation. Additionally, all the proposed nodes should be efficiently cooled by a double ton split A/C located within a few feet of the nodes. The quote should contain the BTUs produced per hour, both per node and in total by all nodes, alongside the typical cooling rate for a 2 ton A/C in the same units.
9	Power calculations and UPS requirements	The bid should contain power computations for each node and the assembly as a whole. It should also contain UPS specifications for 1 hour backup power supply.

**In case of a price conflict, the vendors with the options quoted below will be preferred in the following order of priority:**

1. Higher computational speed measured in terms of TFLOPs.
2. Higher RAM at a minimum speed of 2933 MHz.

**Terms and conditions:**

1. Two-bid system (separate technical and financial bids) in sealed envelopes with commercial or technical bid clearly indicated on the envelope. These two sealed envelopes should be placed within a larger envelope and “HPC Bid - Swetha Veeraraghavan, Civil Engg. Department” should be written on the outer envelope.
2. The vendors quoting should be registered with IISc. The quote should carry your vendor registration number in the Technical bid.
3. The technical bid must clearly specify the prescribed technical specifications without including the prices. Please provide detailed component specifications and an item-wise compliance report of all the specifications in the technical bid.
4. Vendors who include price information in the technical bids will be automatically disqualified.
5. Vendors must provide three independent reference letters from completed (within last 3 years) cluster installations worldwide, with similar or higher minimum peak performance, along with the technical bid. IISc may contact more users for obtaining independent references. The committee will have right to reject a bid based on reference letters.
6. All equipment must be compatible with Indian Electrical Standards/Codes.

7. The vendor must carry out the installation, commissioning and cabling of all the hardware as well as software components.
8. The commercial bid should contain among other things, payment terms, warranty, installation, commissioning etc. as per requirements of IISc mentioned in the tender document. All such conditions must be in line with the tender. In case of any deviation or conditional offer, the bid may be treated as non-responsive and hence will not be considered for evaluation.
9. The bids should be valid for at least 90 days from the last date of submission of the quotation.
10. The price should be quoted in either INR or US dollar, including CIF, and other taxes and duties. Please note that IISc, being an academic institution with University status, is eligible for customs duty exemption. Please also include any available educational discounts in the price bid.
11. Please mention per node cost in the bid. Any additional nodes have to be supplied at the same cost quoted in the original bid.
12. Please also include separately the prices of extra RAM and SATA HDD (same components as the ones in the proposed solution) and other spares.
13. Please also include separately the price of an extra V100 GPU card to be added to the CPU+GPU compute node.
14. Price bids of only technically qualified vendors will be considered and the order will be placed on lowest bid from a technically qualified vendor.
15. IISc reserves the right to reject the tender without assigning any reasons thereof.
16. The total solution as per the agreed bill of materials must be supplied within 6-8 weeks after receiving a firm PO from IISc. The installation, testing and acceptance must be completed within 2 weeks after supply of the equipment. The vendors should indicate the tentative delivery and installation date in the technical bid.
17. If a bidder wins the order, the payment for the product shall be made to the winning bidder after delivery, set-up, satisfactory verification of the product components. Any damaged component detected at the time of the OS installation/verification should be promptly replaced, at no extra cost, and the warranty period should be correspondingly revised.
18. Tender documents that do not satisfy the "Terms and Conditions" listed herein will be disqualified.
19. The tender documents should be sent to the following address no later than **21/09/2021 by 5 PM:**

The Chairman  
Civil Engineering Department  
Indian Institute of Science, Bangalore 560012  
Karnataka, India.  
Attn: Swetha Veeraghavan