

# Domestic tender notification for the procurement of “high performance GPU-based compute node” (Last date: 26<sup>th</sup> March 2024 by 5:00 pm)

Dear Sir/Madam,

This is an open domestic tender (see Annexure 2 for eligibility criteria) in order to satisfy the computational needs of my research group. We plan purchase a stand-alone **high-performance GPU-based compute node**, to augment our existing computational capabilities.

In the following, we list the minimum specifications that we insist upon in the solution to be provided against this tender.

## GPU Node

#	Heading	Specifications
1	Form factor	2U or 4U.  Note: Dense solutions that satisfy other requirements are acceptable.
2	CPU	Latest AMD/Intel server-model processor.  Minimum clock speed: 2.3 GHz.  Minimum number of cores: 32C/64T per socket.  Minimum cache: 60M  In case of AMD, 7452 EPYC processors or better are preferred.  In case of Intel, Xeon® Gold 6448H processors or better are preferred.  Denser solutions (i.e., more CPU cores/socket) that satisfy other requirements will be acceptable.
3	GPU	GPU cards are required for deep learning applications. Hence, processors that are compatible with ‘Tensor core’ architecture of NVIDIA are preferred.  Minimum of 2× NVIDIA A100 with 80GB GPU Memory Passive Cooling with NVLink Interconnect or better.  If a single GPU card per node solution is provided, the card provided has to be compatible with NVLink interconnect for future expansions.

		Expansion slots for GPU cards compatible with NVLink should be available, if multiple GPU cards per node solution is provided. Please specify how many slots will be available in the technical specifications.
4	Mother board	Dual socket.
5	CPU Memory	Minimum 16 GB/core.  Solution should use 64 GB (or higher) DDR4 ECC RDIMM modules, at 2933 MHz or better, in balanced mode.  Additional DIMM slots for future expansion must be available.
6	USB ports per node	Minimum 2 USB 2.0 or better.
7	Video o/p per node	1 onboard VGA port or better.
8	Storage	i) Minimum 32 TB of usable space in RAID 6 configuration with minimum 8 TB space per disk, 6 Gbps SATA Enterprise HDD @7200 ii) 1 RAID controller, 8 internal SAS/SATA ports, RAID levels 0,1,5,6,10,50,60 with minimum 2 GB cache, BBU iii) 3 SSD/NVME enterprise-class disks, 2 in RAID 1 configuration and 1 as hot spare, for OS+code storage, minimum 512 GB per disk
9	High speed interconnect	Dual port 100 Gbps EDR Infiniband card (for future expansion).  The card supplied should be compatible with a Mellanox Infiniband® EDR 100 Gbps 36 SFP port primary interconnect switch.
9	Power Supply	i) Redundant power supply of 80 Plus Platinum level or better. ii) The minimum PSU Wattages should be suitable for the provided solution. iii) A supporting calculation of the power utilization and PSU efficiency must be provided.
10	OS Support	Latest LTE version of Ubuntu OS.

### Interconnect cables

#	Heading	Specifications
1	Infiniband cables	Passive Copper Cable EDR up to 100 Gbps – number of cables as required by the solution.

		Each cable should be minimum 2m in length.  The cables should be compatible with Mellanox Infiniband® EDR 100 Gbps 36 SFP port primary interconnect switch that is already installed.
2	Ethernet cables	1 Gigabit Ethernet cables that are compatible with a Netgear management switch –number of cables as required by the solution.

### Ethernet network switch

#	Heading	Specifications
1	Ethernet switch	48 port 1 Gigabit Ethernet network switch that is rack mountable by Netgear brand or similar.  Include ethernet cables for this switch as needed by the solution.  The ethernet switch and cables are required for IPMI access of all nodes.

### Rack enclosure

#	Heading	Specifications
1	Size	42 U × 1000 mm × 600 mm
2	Material	1 mm mild steel
3	Sides	Louvered ventilated side cover with locks
4	Front	Honeycomb perforated single door with lock and handle
5	Rear	Honeycomb perforated single door with lock and handle
6	Mobility	4 Castor wheel with two having breaking locks
7	Locator	2 levelling feet to adjust floor errors and station rack in place
8	PDU	48 C-13 socket PDU, distributed on both sides of the rack, compatible with 3-phase power supply, with single MCB no-cable.  Thus, there can be two 24 C-13 socket PDUs attached to each side of the rack, forming a total of 48 sockets.

### Software installation

#	Heading	Specifications
1	The software listed in the specifications column should be installed	i) OS installation in all the node. ii) Queue management system (e.g., PBS or SLURM)

		iii) Software to manage compute nodes that are added in future (e.g., xCAT or NIS binding) iv) Gfortran (from OS installation), and Intel Fortran C/C++ compilers and libraries (from oneapi – if necessary, source files can be provided by IISc) v) Node monitoring system (via IPMI) vi) CUDA libraries for GPU computing vii) Anaconda to manage python libraries viii) Configuration of firewall ix) Compilation of density functional theory codes (source files to be given by Prof. Sai Gautam Gopalakrishnan)
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### Other requirements

1. Minimum three years warranty on all components should be included in the quoted cost.
2. OS installation and other software installation are necessary.
3. Detailed instructions on installing the node (including reinstallation in case of node failure), operating the system, and powering up/down the node.

### Scope of work

- Delivery of all physical equipment at the Department of Materials Engineering, IISc campus
- Physical installation of the new compute node, powering on all the new node
- Software installation
- Testing to ensure that all installed software work as intended on the new node
- Testing to ensure that the queuing system is working with the new node as intended
- Verifying that the new node have an IPMI system installed and can be managed via a web interface from within the Institute network

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

1. More GPU cards per node
2. Newer generation GPUs per node
3. Higher clock speed CPUs per node
4. Higher memory at a minimum of 2933 MHz per node
5. Newer generation CPUs per node
6. Shorter delivery period
7. Extra SSD storage per node

## Terms and conditions

1. The vendors quoting should be registered with IISc. The quote should carry your Vendor Registration Number and/or your Vendor ID in the Technical bid.
2. **Two-bid system (separate technical and financial bids)** in two sealed envelopes.
3. Unpriced bill of materials (BOM) should be included in the technical bid.
4. The technical bid must clearly specify the prescribed technical specifications without including the prices. Please provide in detail the specifications, namely full details of the chassis, motherboard, GPU card, Infiniband card, under each subhead and bullet point. Unique characteristics may be highlighted.
5. Technical bid should be page numbered with a table of contents.
6. Vendors who include price information in the technical bids will be automatically disqualified.
7. At least 3 independent reference letters/completion certificates from completed installations within academic institutions in India with a minimum number of 400 CPU cores and/or GPU-nodes in the recent past, i.e., 2020-21 and 2021-22 financial years or later.
  - a. IISc may contact more users for obtaining independent references. The committee will have right to reject a bid based on reference letters.
8. Indicate tentative delivery period in the technical bid.
9. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids and may ask vendors to provide some performance benchmarks and performance tests.
  - a. Vendors may be required to give presentations detailing technical specifications and demonstrating performance. A satisfactory presentation will be required if a vendor is asked for a demonstration.
10. Financial bids from vendors will be considered only if they qualify the technical bid.
  - a. **Order will be placed from the L1-bidder who is technically qualified.**
11. Indicate the total cost of **1 GPU-based node satisfying the specified technical configuration** in the financial bid.
  - a. Include the cost of physical accessories, such as rack enclosure, network switch and ethernet cables, infiniband card and cables, within the financial bid as separate line items.
  - b. **Include cost of each GPU card in the solution as a line item.**
  - c. Include any installation costs as dedicated line items.
12. **The L1 will be determined based on the total cost of the solution proposed.**
13. As per budgetary constraints for procurement, **GPU cards may be added to the solution provided by the L1, at the same cost per GPU card mentioned in the L1 financial bid.**
14. Prices should be quoted in adequate detail with relation to packing details to cover insurance compensation in case of damage to any specific modules.
15. Delivery and installation of the supply shall be full responsibility of the vendor.
16. **Prices must be quoted in INR only + 18% GST on all components.**
17. **Quotes should be submitted by Indian Original Equipment Manufacturer (OEM) or their authorized Indian distributor.**
  - a. The quotations should be on FOR-IISc Bengaluru basis, in INR only.
18. **The total solution as per the agreed BOM has to be supplied as soon as possible.** Ideal delivery time is 10-12 weeks after receiving a firm PO from IISc and the installation to be complete within a week after supply of the equipment.
19. Payment will be processed only after successful installation of the machine (both hardware and software).

20. IISc also reserves the right to cancel the tender at any time without assigning any reason whatsoever.
21. The tender documents can be sent at the following address not later than 26<sup>th</sup> March 2024, 5:00 pm:

The Chairman  
Department of Materials Engineering  
Indian Institute of Science  
Bangalore 560012  
Karnataka, India  
Attn: Prof. Sai Gautam Gopalakrishnan

## **Annexure 2: Eligibility Criteria**

Prequalification criteria:

1. The Bidder should belong to either class 1 or class 2 supplier distinguished by their “local content” as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter.
  - a. Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
  - b. Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.
2. Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.
3. Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to the Class-1 supplier.
4. MSMEs can seek exemption to some qualification criteria. IISc follows GFR2017 for such details.
5. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere.
6. Original Invoice, Original Warranty Certificate, Original Test Reports should be produced for all imported items from OEM (Original Equipment Manufacturer) at the time of supply of the equipments.
7. Details of experienced service engineer including contact detail should be provided in tender document.
8. Bidder shall have to submit audited accounts (balance sheet profit and loss account) of financial years 2020-21, 2021-22 and 2022-23. Audited statement must be signed and stamped by a qualified chartered accountant.
9. Bidder must submit Income Tax return for assessment year – 2020-21, 2021-22 and 2022-23.
10. Bidder must submit up-to-date sales tax or GST clearance certificate.