



Department of Physics
Indian Institute of Science
Bangalore, India, PIN 560012

Domestic Tender

Dear Madam/Sir,

Subject: Request for quotation for a high-performance computing cluster FOR-IISc Bangalore basis in INR only

The Shibanda Das group at the Department of Physics intends to purchase a high-performance computational cluster (HPC) that has **one master and 4-6 compute nodes. The compute nodes should have a rackmount 4U form factor with support for 8x 8TB Enterprise SATA HDD.** During the evaluation, preference will be given to system with higher extensibility (ease of adding new nodes to the cluster in future). Also, each of the server nodes should be individually serviceable without shutting down the other server nodes. Proposed servers should be preferably managed by single network at 1 GBPS or higher speed. The cluster should be installed with the necessary schedulers, drivers, and connectors for running and monitoring container-based jobs, Spark with HDFS based jobs and MPI based jobs, thin client environment, state of the art database systems like PostgreSQL or equivalent. Virtualization and aggregation compatibility should be made available.

Following are item wise specifications. Only core components are cited below, and the bidders are expected to also quote for and supply the necessary unlisted accessories (e.g. LAN, Rail, Software etc.) that will be required for setting up the complete solution.

1. **Master Node:** A separate master node with the following specifications. All components of a node must have itemized price.
 - a. **4th Generation Dual x86 Intel Xeon processor** with 32 core per processor with base frequency of 2.4 GHz or higher with 4GB per core DDR5-4800 MHz or higher (or)
4th Generation EPYC Dual processor 32 cores with 2.4 GHz or higher frequency with 4GB per core DDR5-4800 MHz or higher.
 - b. Motherboard should support at least 12 DIMM slots. Memory should be configured in a balanced way utilizing all the memory channels and with additional DIMM slots available to double the memory capacity.
 - c. 2x 512 GB SSD for OS.
 - d. 8x8 TB Enterprise SATA HDD.
 - e. RAID Card with min 1 GB cache with RAID 5 support up to 8 disks.

- f. Dual gigabit LAN ports
 - g. **NIC:** 2x10GBase-T LAN ports with necessary cables
 - h. **Management:** Dedicated management port with virtual media over LAN and KVM-over-LAN support
 - i. USB ports: At least 2 USB 3.0 (front)
 - j. IPMI / Remote management features
 - k. Redundant power supplies, Platinum level or higher efficiency
 - l. 4U rackmount form factor with Rail Kit
 - m. C13 power cords suitable for C13 outlet power strip
2. **Compute Nodes:** Cluster with the following specifications per node. All components of a node must have itemized price. Quantity: 4-6 nodes.
- a. **2 x 4th Generation Dual x86 Intel Xeon processors**, with 32 core per processor with base frequency of 2.4 GHz or higher with 8GB per core DDR5-4800 MHz or higher
(or)
2 x 4th Generation EPYC Dual processor 64 cores with 2.4 GHz or higher frequency with 4GB per core DDR5-4800 MHz or higher.
 - b. Memory: Motherboard should support at least 12 DIMM slots. Memory should be configured in a balanced way utilizing all the memory channels and with additional DIMM slots available to double the memory capacity.
 - c. GPU: The motherboard should support at least 2 GPU cards. Provide itemized quotation for the following:
 - i. 2 x NVIDIA RTX A4000 16GB Graphics card
 - ii. 2 x NVIDIA RTX4000 ADA 20GB Graphics card
 - d. 1x 512 GB SSD for OS
 - e. Itemized price for 8 TB Enterprise SATA HDD. Quantity will be decided later.
 - f. RAID Card with min 1 GB cache with RAID 5 support up to 8 disks.
 - g. **Management:** Dedicated management port with virtual media over LAN and KVM-over-LAN support
 - h. **NIC:** 2x10GBase-T LAN ports and a Separate 1Gb port for Cluster management
 - i. USB ports: At least 2 USB 3.0 (front)
 - j. IPMI / Remote management features
 - k. Redundant power supplies, Platinum level or higher efficiency
 - l. 4U rackmount form factor with Rail Kit
 - m. C13 power cords suitable for C13 outlet power strip
3. **Network/Interconnect:**
- a. At least 12-port 10G Ethernet Switch with Rack mountable Rail kit and necessary cables
 - b. A separate 1G Ethernet switch with at least 16 ports must be provided for management and administration of the cluster.
 - c. All network cables should be listed and supplied.

4. Other software:

- a. CentOS operating system, latest version
- b. SLURM
- c. Open-source cluster management tools such as Rocks, Ganglia
- d. Application packages provided by IISc should be installed and demonstrated on the HPC cluster. A complete list of packages is provided below. Unless the listed software packages are installed properly and tested to satisfaction for performance and efficiency, the payment will not be done.
- e. CUDA tools should be installed and CUDA enabled applications provided by IISc should be installed and demonstrated.
- f. The following packages need to be installed (in module form) and tested. Vendor may be requested to also test software not mentioned in the list. For more information on the software packages, please send an email to Dr. Shibananda Das (shibananda@iisc.ac.in) with specific questions.
 - i. Molecular Dynamics Simulation Packages: GROMACS (patched with plumed) - with mpi, LAMMPS - with mpi, HOOMD-blue – with mpi, NAMD - with mpi and VMD, AMBER, VOTCA (with gromacs).
 - ii. Generic day-to-day Softwares: Python3 with numba, numpy, scipy, matplotlib, ovito and h5py libraries, Matlab, Mathematica, BLAS and LAPACK (licence can be obtained from institute), HDF5, Anaconda package manager, OpenCL and PyopenCL, OpenACC.
 - iii. Compilers: OpenMPI, Intel & Intel MPI, GNU compilers, Mpicc, Cmake, keras, tensorflow-gpu, CUDNN, GSL.

General Specification:

- a. All the equipment must be compatible with Indian electrical standards/codes.
- b. The bidder must carry out Racking, stacking, installation, commissioning and cabling of all supplied hardware components and software.
- c. The HPC cluster solution must be housed in suitable chassis. Dense computing platform with extensibility option is preferred.

- d. The bidder should provide manufacturing authorization form (certificate from OEM for quoting the requirement).
- e. Also, bidder/OEM must provide at least three reference sites 10 TF or above (CPU only) where they have carried out the installations in the last 3 years. The purchase committee will independently obtain inputs from referees before making the final decision on the bid. PO copies and installation reports must be submitted along with the Technical Bid.
- f. The lowest commercial bid and/or the most agreeable technical bid should have the option for further negotiations.
- g. In case of any delay in delivery, replacement, or rectification, the warranty period should be correspondingly extended.
- h. Please mention per node cost in the bid. Any additional nodes must be supplied at the same cost quoted in the original bid.
- i. Bidder/OEM must quote exactly as per mentioned specifications for entire solution, partial offers will not be accepted. In particular, the bidder/OEM should provide itemized price for each component mentioned in the tender. Partial/Incomplete price or lumpsum price for the entire solution will not be accepted. Bidder/OEM not providing itemized price for any component will be immediately rejected.

Eligibility Criteria:

- a. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
- b. The bidder/OEM should have set up at least 3 or more HPCs in the last 3 years with at least one cluster with 256 or higher number of cores. Purchase order copies of previous installations are required.
- c. The bidder should be in HPC/IT business for at least 3 years. Support documents should be submitted.
- d. The bidder should have a sales and service office in Bangalore.
- e. The OEM should have a registered office in India with service center facilities in Bangalore. Details of HPC engineers of bidder and OEM should be provided.

- f. The OEM should give an undertaking that warranty will be directly provided by the OEM. Also, the OEM should give an undertaking to provide necessary technical support in case the bidder fails to provide such a service to IISc.
- g. Bidder/OEM with poor service track record at IISc will not be considered.
- h. The Bidder should not be currently blacklisted by any institution, bank in India.
- i. **Domestic bidders should follow the terms and conditions as per the notification No. P-45021/2/2017-PP (BE-II) dated 16th Sep 2020. Please provide documents certifying your vendor class. Without this certificate the bid will be rejected.**
- j. The Bidder should belong to either Class-1 or Class-2 suppliers 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%.
- k. The quotations should be on FOR-IISc Bangalore basis in INR only.
- l. 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.
- m. Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to the Class-1 supplier.
- n. MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

Other Terms and Conditions:

a. **Submission of Tender:**

- 1. All documentations in the tender should be in English.
- 2. Tender should be submitted in two envelopes (two bid system).
 - Technical Bid (Part-A) – Technical bid consisting of all technical details and check list for conformance to technical specifications. The technical proposal should contain a technical compliance table with 5 columns.
 - i. The first column must list the technical requirements, in the order that

- they are given in the technical requirement above.
- II. The second column should provide specifications of the proposed solution against the requirement. Please provide quantitative responses wherever possible with technical details in annexure.
 - III. The third column should describe your compliance with a “Yes” or “No” only. Ensure that the entries in column 2 and column 3 are consistent.
 - IV. The fourth column should state the reasons/explanations/context for deviations, if any.
 - V. The fifth column can contain additional remarks from the bidder/OEM. You can use this opportunity to highlight technical features, qualify response of previous columns, or provide additional details.
- Commercial Bid (Part-B) – Indicating itemized pricing for each of the configuration quoted in the technical bid and other commercial terms and conditions.
3. The technical bid and commercial bid should each be placed in separate sealed covers, superscripting on both the envelopes the tender no., the due date, and technical (or commercial bid, as the case may be). Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly subscribed “Bid for High Performance Computing Cluster for Dr. Shibananda Das” along with the Tender No and the Due Date.
 4. The SEALED COVER superscripting tender number/due date should reach Chairperson Office, Department of Physics, Indian Institute of Science, Bangalore – 560012, India on or before due date mentioned in the tender notice. In case due date happens to be holiday the tender will be accepted and opened on the next working day. If the quotation cover is not sealed, it will be rejected.
 5. The price must be quoted in INR (Indian Rupee). Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
 6. Prices quoted should be inclusive of all taxes / duties. The prices quoted should be inclusive of delivery of the items to the site and installation at site.
 7. While evaluating the technical bid, weightage will be given for extendibility, performance and adherence to specifications and references from past customers. The purchase committee may want to contact past customers, and the vendors are requested to provide references that can be contacted for the same.
 8. The Institute reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time prior to the award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to

inform the affected bidder or bidders.

9. Incomplete bids will be summarily rejected.
10. The technical bid should furnish all requirements of the tender along with all annexures below and submit to

The Chairman,
Department of Physics,
Indian Institute of Science,
Bangalore – 560012

- b. **Validity of the Offer:** The offer shall be valid at least 60 Days from the last date for submission of quotes.
- c. **Warranty:** Three-year on-site warranty should be provided for the hardware. If the item is found to be defective, it must be replaced at the cost of the bidder within 30 days of receiving written notification from IISc, Bangalore. In the event of any delay in the repair or replacement, the warranty period will be extended by a corresponding amount of time to account for the downtime.
- d. **Extended Maintenance:** Annual Maintenance Contract (AMC) option for two additional years post warranty. Quote this as an optional item.
- e. **Delivery and Installation:** The bidder shall provide the lead time to delivery, installation and made functional at IISc, Bangalore from the date of receipt of purchase order. The system should be delivered, installed and made functional within 6 weeks from the date of receipt of purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and inspection of all the items and features/capabilities tested by the IISc, Bangalore. After successful installation and inspection, the date of taking over of entire system by the IISc, Bangalore shall be taken as the start of the warranty period. No partial shipment is allowed.
- f. **Payment Terms:** 100% payments will be released after completion of delivery subject to TDS as per rules. AMC cost (if ordered), after completion of warranty period) will be released on half - yearly basis at the end of each six months subject to satisfactory services. The AMC will be comprehensive. Price basis must be on FOR-IISc Bangalore basis only. As per GFR, no advance payment can be made to domestic vendors unless an equal amount of bank guarantee is provided.
- g. **Statutory Variation:** Any statutory increase in the taxes and duties subsequent to bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc Bangalore subject to the claim being supported by documentary evidence.

However, if any decrease takes place the advantage will have to be passed onto IISc, Bangalore.

- h. **Disputes and Jurisdiction:** Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore, India.

Important Dates:

Date of publishing/release of the enquiry: Jan 29, 2025

Pre-bid clarification: Feb 11 or 12, 2025 (by appointment through email)

Last date of submission of Quote: Feb 21, 2025, 5:00 PM. Physics office

Sincerely,
Shibananda Das
Assistant Professor
Department of Physics
Indian Institute of Science
Bangalore 560012

Annexure-1

Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Details of the Bidder

| Sl. No | Items | Details |
|--------|---|---------|
| 1. | Name of the Bidder | |
| 2. | Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed) | |
| 3. | Registration No/ Trade License, (attach attested copy) | |
| 4. | Registered Office Address | |
| 5. | Address for communication | |
| 6. | Contact person- Name and Designation | |
| 7. | Telephone No | |
| 8. | Email ID | |
| 9. | Website | |
| 10. | PAN No. (attach copy) | |
| 11. | GST No. (attach copy) | |

Signature of the Bidder

Name
Designation, Seal

Date:

Annexure-2

Declaration regarding experience
To,
The Chairman,
Department of Physics,
Indian Institute of Science,
Bangalore – 560012

Ref: Tender No: XXXXXXXXXX
Dated: XXXXX

Supply and Installation of HPC Cluster

Dear Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has XXXXXX years of experience in supplying and installing the items mentioned in the tender.

Yours faithfully (Signature of the Bidder)

Printed Name, Designation, Seal

Date:

Annexure-3

Declaration regarding track record
To,
The Chairman,
Department of Physics,
Indian Institute of Science,
Bangalore – 560012

Ref: Tender No: XXXXXXXXXX
Dated: XXXXX

Supply and Installation of HPC Cluster

Dear Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company/ firm is not currently debarred /blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

| Sl.No | Country in which the company is Debarred /blacklisted / case is Pending | Blacklisted / debarred by Government / Semi Government/Organizations /Institutions | Reason | Since when and for how long |
|-------|---|--|--------|-----------------------------|
| | | | | |

(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully (Signature of the Bidder)

Name, Designation, Seal

Date:

Annexure-4

Declaration of the acceptance
of Terms and Conditions

To,

The Chairman,

Department of Physics,

Indian Institute of Science,

Bangalore – 560012

Ref: Tender No: XXXXXXXXXX

Dated: XXXXX

Supply and Installation of HPC Cluster

Dear Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully (Signature of the Bidder)

Name, Designation, Seal

Date:

Annexure-5

Details of items quoted:

| | |
|--|--|
| a. Company Name | |
| b. Product Name | |
| c. Part / Catalogue number | |
| d. Product description / main features | |
| e. Detailed technical specifications | |
| f. Remarks | |

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.