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 Tanmoy Das group at the Department of Physics intends to purchase a high-performance computational cluster (HPC) that has up to 6 CPU compute nodes, 2 GPU compute nodes and 1 master node. The compute nodes should be a rack-mountable with a form factor of 4U or less**.**

During the evaluation, preference will be given to a 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 preferably be managed by a single network at 1 GBPS or higher speed. The cluster should be installed with the necessary schedulers, drivers, and other necessary equipments and softwires.

The 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 cables, Railings, Software etc.) that will be required for setting up the complete solution. Please provide separate prices for each item in your quotation for the following configurations.

1. **Master Node:** A separate master node with the following specifications. All components of a node must have an itemized price.

    a. **4th Generation Intel Xeon Processor** with at least 16 cores with 2.4 GH or higher frequency and preferably as a single-socket system.
    (or)
    4th Generation EPYC Processor 32 cores with 2.4 GHz or higher frequency and preferably as a single-socket system.
    b. Motherboard should support at least 12 DIMM slots. Please provide an itemized price for the 64 GB RAM module. DDR5-64GB RAM at 4800 MHz or higher.
    c. 2x 512 GB SSD for OS.
    d. Storage: 8x 8 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, Titanium level efficiency

2. **CPU Compute Nodes:** Cluster with the following specifications per node. All components of a node must have an itemized price. Quantity: 4-6 nodes.

    a. **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 GHz or higher (also provide an itemized quote for 4GB per core.)
    (or)
    4th Generation EPYC Dual processor 64 cores with 2.4 GHz or higher frequency with 4GB per core DDR5-4800 GHz or higher (also provide an itemized quote for 8GB per core)
    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. 1x 512 GB SSD for OS
    d. Storage: 1x8 TB Enterprise SATA HDD.
    e. Management: Dedicated management port with virtual media over LAN and KVM-over-LAN support
    f. NIC: 2x10GBase-T LAN ports with necessary cables
    g. Dual gigabit LAN ports.
    h. Redundant Power Supplies- Titanium level efficiency
    i. IPMI/Remote management features

3. **GPU Compute Nodes**: GPU compute nodes must support up to 2 Nos of NVIDIA GeForce RTX 4080. Quantity: 1-2 nodes.

    a. **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)
    4th Generation EPYC Dual processor 64 cores with 2.4 GHz or higher frequency higher 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. 1x 512 GB SSD for OS
    d. Storage: 1 x 8TB enterprise HDD.
    e. Pricing for RTX 4070 (12GB), RTX 4070Ti (12GB) and RTX 4080 (16GB)
    f. Management: Dedicated management port with virtual media over LAN and KVM-over-LAN support

g. NIC: 2x10GBase-T LAN ports with necessary cables
h. Dual gigabit LAN ports.
i. Redundant Power Supplies- Titanium level efficiency
j. IPMI/Remote management features

4. **Network/Interconnect:**

    a. Two 24 port x 10 Gigabit b managed switch with necessary cables
    b. One 24 port 1 Gigabit switch for management and administration of the cluster with necessary cables.
    All network cables should be listed and supplied.

5. **Other software:**
    a. Opensource Linux 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 made.

    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 Prof. Tanmoy Das (tnmydas@iisc.ac.in) with specific questions.

        i. Generic day-to-day Softwares: Python3/3.9 - with numba, numpy, scipy, matplotlib, Matlab, BLAS and LAPACK (license can be obtained from institute), R, opencv-python, opencv contrib-python, pandas 17) Anaconda package manager, OpenCL and PyopenCL, FreeSurfer ANTs, BrainSuite.
        ii. Compilers: OpenMPI, Intel & Intel MPI, GNU compilers, Mpicc, Cmake, keras, tensorflow-gpu, CUDNN, AOCC (In case of AMD based solutions can be proposed and installed on the cluster), GSL.
        iii. Matlab, Mathematica, VASP, Quantum Espresso, (academic license is available for all).

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 master node, CPU-Compute and GPU-compute nodes must be all Intel processor-based or all AMD processor-based.

d. The HPC cluster solution must be housed in a suitable rack. Dense computing platform with extensibility option is preferred.

e. A three-year on-site warranty should be provided for the hardware.

f. The bidder should provide manufacturing authorization form (certificate from OEM for quoting the requirement)

g. Also, bidder/OEM must provide at least three reference sites 50 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.

h. The lowest commercial bid and/or the most agreeable technical bid should have the option for further negotiations.

i. The delivery, installation, commissioning and acceptance of the system should be completed within **10 weeks** from the date of the release of the purchase order.

j. In case of any delay, the warranty period should be correspondingly extended.

k. Please mention per node cost in the bid. Any additional nodes have to be supplied at the same cost quoted in the original bid.

l. Bidder/OEM has to 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 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 512 cores. Purchase order copies of previous installations are required.

c. The bidder should be in HPC/IT business for at least 10 years. Support documents should be submitted.

d. The bidder should have an annual turnover of Rs. 10 Crores or above in the last 3 Financial Years. Audited Balance sheets should be submitted.

e. The bidder should have a sales and service office in Bangalore.

f. 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.

g. 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.

h. Bidder/OEM with poor service track record at IISC will not be considered.

i. The Bidder should not be currently blacklisted by any institution, bank in India

j. **Domestic bidders should follow the terms and conditions as per the notification No. P-45021/2/2017-PP (BE-II) dated 16th Sep, 2020. The vendor/bidders shall provide the Local content declaration certificate claiming class-I/Class-II while submitting their bids. Please provide documents certifying your vendor class. Without this certificate the bid will be rejected.**

k. 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%.

l. The quotations should be on FOR-IISc Bangalore basis in INR only.

m. 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.

n. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to the Class-1 supplier.

o. MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

The quotation should be in two parts:
Part I (Technical bid) and Part II (Commercial bid)
Part I should be put in a sealed cover and superscripted "Technical Bid". Part II should be put in a separate sealed cover and superscripted "Commercial Bid". Technical bid should be exactly same as commercial bid **except that prices are not shown in technical bid**. Any bid found in violation of this requirement will be automatically disqualified. Technical bid should have item wise compliance report of all specifications. The above covers should be put in another cover. This cover should be sealed and subscripted "Bid for High Performance Computing Cluster for Prof. Tanmoy Das".

The Technical bid should not have any details about pricing. **The commercial bid should have itemized pricing for each of the configuration quoted in the technical bid.** The last day for submitting the bid is 5st **December, 2023**. The offer should be valid for a period of at least 60 days from the last date for submission of quotes. 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 and **should include only INR quotes**. Both technical and commercial bid will be negotiable for the lowest costing commercial bid and most desirable technical bid. 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.

Payment will be made after satisfactory supply and installation. The system supplied may be tested/certified by us through an identified person/committee. Three-year on-site warranty should be provided for the hardware. **The warranty period will commence from the date of acceptance of the equipment.**

Important Dates:

Date of release of the enquiry	: 14 Nov, 2023
Pre-bid clarification	: 20 or 22 Nov, 2023 (by appointment through email)
Last Date of submission of Quote	: 5 Dec, 2023, 5:00 PM. Physics office

Sincerely,
Tanmoy Das
Associate Professor
Department of Physics
Indian Institute of Science
Bangalore 560012 Ph: +91-80-2293 3166