



**CENTRE FOR HIGH ENERGY PHYSICS
INDIAN INSTITUTE OF SCIENCE
BANGALORE 560 012
INDIA**

Domestic Tender for HPC computing Cluster

The Centre for High Energy Physics (CHEP) solicits Tenders for a High Performance Computing Facility (HPC) CPU-GPU Cluster with the following specifications:

It is a two server cluster (one master node and one compute node) with each server having the configuration as listed in Table 2 and 3 . (f the below versions are not explicitly available, higher versions can be used.)

Table 1 Number of Server Units

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1	Number of Nodes (Master and Compute included)	2

Specifications of the Master Node:

Table 2: Master Server Configuration

SL No	ITEM	QUANTITY
1	Perferably, 4U, Dual SKT LGA4189 Socket P+,(2+1) and And compulsorily 2200 W Reduntant Platinum PSU	1
2	Intel Xeon Gold 6348 28 Core 2.6 GHz Processors	2
3	32 GB DD4-3200 ECC RDIMM (24 Free DIM slots)	8
4	512 GB 2.5" SATA SSD for OS	2
5	8TB 3.5" 7.2 K RPM Enterprise SATA HDD for storage. A total of 12 slots should be available for future upgrada- tion adjustable to both 2.5"SATA SSD and 3.5" SATA HDD.	6
6	On-board Intel SATA RAID 0/1/10/5	1

Table 2: Master Server Configuration		
SL No	ITEM	QUANTITY
7	On board Dual 10 Gb/S LAN ports (Intel X550-AT2) - front	1
8	Dedicated Management Port - Front	1
9	2 USB 3.0 (front) + 1 VGA (front)	1
10	Preferably Rack Mount Rail kit - 4U form Factor	1

Table 3: Compute Server Configuration		
SL No	ITEM	QUANTITY
1	Preferably, 2U, Dual SKT LGA4189 Socket P+,(2+1) And compulsorily 2200 W Reduntant Platinum PSU	1
2	Intel Xeon Gold 6348 28 Core 2.6 GHz Processors	2
3	NVIDIA A100/80 GB GPU Should be upgradable to 4 NVIDIA A100/80 GB GPUs in the future.	2
4	32 GB DD4-3200 ECC RDIMM (24 Free DIM slots)	8
5	8TB 3.5" 7.2 K RPM Enterprise SATA HDD for DATA	1
6	On-board Intel SATA RAID 0/1/10/5	1
7	On board Dual 10 Gb/S LAN ports (Intel X550-AT2) - front	1
8	Dedicated Management Port - Front	1

Table 3: Compute Server Configuration		
SL No	ITEM	QUANTITY
9	2 USB 3.0 (front) + 1 VGA (front)	1
10	Preferably Rack Mount Rail kit - 2U form Factor	1

I) Other Specifications:

1). The system should be configured so that each server node can be individually serviced without affecting the other server nodes. A single network should manage the servers at 1 GBPS or higher. The cluster should be installed with the necessary schedulers, drivers, connectors, state-of-the-art database systems, etc.

2) Network/ Interconnect: The following options should be quoted:

(i) Infiniband switch with 1:1 non-blocking architecture with sufficient ports for the proposed cluster with 25% additional capacity for future expansion or DLINK DGS 1024C 24-Port Gigabit Unmanaged switch: quantities 2

(ii) A separate 1G network should be provided for management and administration of the cluster. Higher speeds will be preferred.

(iii) All network cables should be listed and supplied.

(iv) 42U rack with PDUs and other accessories must be quoted.

The Master node and compute nodes will be part of the same cluster. One can include Gigabit networking as the default, and separately mention the option of upgrading to the Infiniband adapters.

3) Other software:

(i) Latest version Cent-OS operating system

(ii) Open-source compilers and cluster management tools

(iii) Various application packages should be installed and demonstrated on the HPC cluster. A complete list of packages is provided below. The listed software packages are to be installed properly and tested to satisfaction for performance and efficiency for the payment to be done.

(iv) CUDA tools should be installed and CUDA enabled applications provided by IISc should be installed and demonstrated.

(v) Various softwares need to be installed: Python 3/ 3.5 - with numba, numpy, scipy, matplotlib, Matlab, BLAS and LAPACK (licence can be obtained from institute), R, opencv-python, opencv contrib-python, pandas 17, Anaconda package manager, OpenCL and PyopenCL, FreeSurfer ANTs, BrainSuite.

(vi) Compilers: OpenMPI, Intel fortran , C, C++ & Intel MPI compilers, GNU compilers, Mpicc, Cmake, keras, tensorflow-gpu, CUDNN, AOCC(In case of AMD based

solutions can be proposed and installed on the cluster), GSL.

- (vii) A queuing system such as PBS Torque or SLURM.

4) General Criteria:

- (i) All of the components must be compatible with Indian electrical standards.
- (ii) The bidder needs to do the racking, stacking, installation, commissioning, and cabling of all components (hardware and software).
- (iii) The HPC cluster solution must be housed in a suitable chassis. Dense computing platform with extensibility option is preferred.
- (iv) The bidder should provide manufacturing authorization form (certificate from OEM for quoting the requirement).
- (v) The bidder/OEM must provide 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.
- (vi) The lowest commercial bid and/or the most agreeable technical bid must have the option for further negotiations.
- (vii) If there is any delay in delivery, replacement, or rectification, the warranty period should be correspondingly extended.
- (viii) The cost per node must be mentioned in the bid. Any additional nodes must be supplied at the same cost quoted in the original bid.
- (ix) In addition to the warranty for 3 years, the vendor must provide an annual maintenance contract (AMC) for two more years.

5) Eligibility criteria:

- (i) The quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
- (ii) 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 and Infiniband interconnect. Purchase order copies of previous installations are required.
- (iii) The bidder should be in HPC/IT business for at least 10 years. Documents supporting this should be submitted.
- (iv) The bidder should have an annual turnover of Rs. 50 Crores or above in the last 3 Financial Years. Audited Balance sheets should be submitted.
- (v) The bidder should have a sales and service office in Bengaluru.
- (vi) The OEM should have a registered office in India with service center facilities in Bengaluru. Details of HPC engineers of bidder and OEM should be provided.
- (vii) The OEM should give an undertaking that warranty will be directly provided by the OEM. The OEM should give an undertaking to provide necessary Technical support in case the bidder fails to provide such a service to IISc.
- (viii) Bidder/OEM with poor service track record at IISc will not be considered.
- (ix) The Bidder should not be currently blacklisted by any institution or bank in India.
- (x) Bidder/OEM has to quote exactly as per mentioned specifications for entire solution. Partial offers will not be accepted.
- (xi) Domestic bidders should follow the terms and conditions as per the notification No. P45021/2/2017-PP (BE-II) dated 16th Sep, 2020.

Terms and Conditions:

1. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
2. The total solution as per the agreed bill of materials has to be supplied within 4 weeks after receiving a firm PO from IISc and the installation to be complete within a week after supply of the equipment.
3. The vendors are requested to submit the following declaration if they participate in the local tender and if the item is not manufactured in India: "We hereby declare that is a class 1/2 local supplier in accordance and manner as specified in Order No. P45021/2/2017-PP (BE-II) dated: 04th June 2020 and OM No. P-45021/102/2019-BE-II-Part(1) (E-50310) dated 04.03.2021 issued by DIPP, Ministry of Commerce and Industries, Gol."
4. The offer has to clearly explicitly state the supply part, F & I, I & C, Warranty services and any other charges separately.
5. A copy of the masked Commercial bid has to be given in the technical offer.
6. Delayed and/or incomplete tenders are liable to rejection.
7. The technical bid and the commercial bid should be duly signed by the authorized representative of the bidder.
8. The Technical Bid and the Commercial Bid should be bound separately as complete volumes.
9. No prices information should be mentioned in the Technical Bid.
10. The Director, IISc reserves the right to modify the technical specifications or the required quantity at any time.
11. The Director, IISc reserves the right to accept or reject any proposal, in full or in part, without assigning any reason.
12. The bidders are requested to go through the Terms and Conditions detailed in this document, before filling out the tender. Agreeing to the terms and conditions of the tender document (by signing all pages of the copy of a tender document) is a mandatory requirement.
13. A tender, not complying with any of the above conditions is liable to rejection. Incomplete proposals are liable to be rejected.
14. 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%.
15. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
16. The quotations should be on FOR-IISc Bangalore basis in INR only.
17. 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.
18. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to the Class-1 supplier.

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

6) Instructions to the Bidders:

The quotation should comprise of Two-cover format – a Technical part and a Commercial part.

Technical Bid

The technical bid should contain the following:

- Un-priced bill of material with quantities of each line item.
- Datasheet for product/model suggested.
- The technical bid should not contain any price information. Non-conformance will result in disqualification.

Commercial Bid

- The Commercial bid should contain details of the prices for each one of the subsystems of the total offer giving clearly the rate and the quantity. Bundling of the prices is not acceptable.
- Optional items must be quoted as a separate line item.
- Installation and Commissioning charges, if any, must be quoted as a separate line item.
- Bidders proposing multiple options must quote for each of the configurations separately including the necessary data-centre requirement as self-contained bids and this is a mandatory requirement.

Covers containing the technical and commercial bids must be individually sealed, and superscribed respectively as “CHEP/chairman-cluster/2023 – Technical Bid” and “CHEP/chairman-cluster/2023 – Commercial Bid”. The two covers must be put in a larger envelope, sealed, superscribed as “Compute Server (CS) - CHEP/chairman-cluster/2023” and sent to/ submitted in Centre for High Energy Physics Office, IISc, Bangalore 560 012, on or before the deadline. All the covers should bear the name and address of the bidder. Non-conformance of any of the above can result in disqualification.

Important Dates:

Start Date for Receiving Tenders: 31 May 2023

End Date for Receiving Tenders: 21 June 2023

Enquires can be send to : vempati@iisc.ac.in, prasadhegde@iisc.ac.in