

Ref. No.: SSCU/GPR/T/2017-79

2 May 2017

# **Subject: Request for proposal for a high-performance computing cluster**

Dear Madam/Sir,

I wish to purchase a high-performance computing (HPC) cluster comprising of Intel Broadwell processors. The detailed specifications are provided below. Vendors are requested to kindly provide a proposal for this requirement. The final choice will be awarded on the basis of lowest price, provided all the specifications are met. The last date for submission of bids is **16/05/2017**. All the quoted prices should be valid for a period of at least 90 days from the last date.

Yours truly,

hovardham

Govardhan P Reddy Assistant Professor Solid State and Structural Chemistry Unit Indian Institute of Science Bangalore, Karnataka, India 560012

Important Dates:

Date of release of inquiry: 02/05/2017 Pre-bid enquiries up to: 09/05/2017 Last date of submissions: 16/05/2017



## The main specifications for the desired machines

1a	Processors	10-core Intel Xeon E5-2640 V4 operating at 2.4 GHz
1b	Core count	48 of the above processors (total: 48 * 10 = 480 cores)
1c	Motherboard	Dual-socket type; the model should be specified in the bid.
2	RAM	64 GB per processor; i.e. total memory = 64 GB * 48 processors = 3072 GB
		All populated DIMMs should be 16GB or 32GB DDR4 2133MHz ECC Chips
3	HDD	Single 1 TB Enterprise hard disk per node; 7.2K RPM.
4	Misc	Standard IPMI with both web and command line interface (CLI) is required. However, no graphics cards, or Infiniband cards, or optical drives are to be included.
5	Form factor	The combined rack height of all the chassis provided should be 24U or lower in standard 19" server racks. If the power plugs are NOT the standard 15 Amps round pin plug, the vendor must provide a power strip with industrial input plugs to be fixed in the rack.
6	Cooling	All the proposed nodes should be efficiently cooled by a double 2 ton split A/C located a 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 /AC in the same units.
7	Network switch	Standard 48-port gigabit ethernet switch.
8	Cluster Management Software	Open source cluster management and monitoring software such as Rocks and Ganglia should be installed.
9	Intel Compiler	Latest Composer Edition for C/C++, Floating 1 seat academic license. The price for this item is to be quoted separately.

### Mode of utilization of the purchased nodes:

- 1. The proposed cluster will be **added** to an existing cluster, which is Intel-based and has a master node (also Intel-based). This master node is intended to be the master for the new nodes, too. Job queues on a Torque+Maui scheduling system will be used to submit jobs to the new & old nodes. Jobs will run either on the new nodes or on the old nodes. This applies to any parallel jobs as well.
- 2. On all the nodes (master + compute (new and old) nodes), the vendor will install the latest stable version of CentOS, which is the OS on the existing cluster and also install the latest version of the Torque+Maui scheduling system. The compute nodes should be rebuildable through network install with a kick start file from the master nodes. The user space (RAIDed



on the master node) and software directories will be mounted via NFS on the new nodes (in the same manner as currently being used on the existing nodes).

- 3. In the interest of best performance on the new nodes, production codes may be compiled specifically for the new Intel machines, if needed, and the job scripts may be directed to use the executables so obtained on the new nodes.
- 4. The source code of standard molecular dynamic simulation packages such as NAMD and GROMACS must be compiled for the new nodes using the Intel C/C++ compiler and the performace of the benchmark calculations should be on par with the recent standard published benckmarks.
- 5. Any servicing of the existing machines and new machines will be handled by the respective suppliers.
- 6. The existing old cluster is not under warranty. The use of the nodes in fashion given above should not in any way adversely affect the warranty of the new nodes, regardless of the supplier.
- 7. The vendors must **explicitly include statements in the bids** that they agree to the above mode of use of the machines and that such a utilization will have no adverse affect on the warranty of the existing or new machines. The absence of clear statements to this effect will lead to disgualification

#### **General Specifications:**

- 1. Both the hardware and software components should be from an original equipment manufacturer (OEM) and it is preferable that they should be from the same OEM.
- 2. All equipment must be compatible with Indian Electrical Standards/Codes.
- 3. The vendor must carry out the installation, commissioning and cabling of all the hardware as well as software components.
- 4. The vendor must provide a minimum of three-year 24x7 comprehensive on-site warranty of all the installed hardware as well as a comprehensive on-site warranty for maintenance of software and cluster management.
- 5. Non-disclosure of various technical specifications listed above may lead to disqualification.
- 6. Clear statement by the vendor about the acceptance of the mode of use given above as well as agreement about non-interference with the respective warranties of the existing and new machines must be included, failing which bid shall be disqualified.
- 7. The servicing of the new and old nodes will be handled by the respective suppliers.



- 8. If any technical (OS intallation or software) help is required, the suppliers of the old or the new nodes may be separately contacted.
- 9. The bid should be valid for at least 90 days from the last date of submission of the bids.
- 10. The price may be quoted in USD only, including CIF, and other taxes and duties. Please note that IISC, being an academic institution with University status is eligible for customs duty exemption.
- 11. A Technical & Purchase Committee shall deliberate on the bids shortly after the submission. The date of this meeting shall be made known to the bidders in sufficient advance. The decision of the Committee will be deemed final.
- 12. The competent authority reserves the right to reject the tender without assigning any reasons thereof.
- 13. If a bidder wins the order, the payment for the product shall be made to the winning bidder after delivery, set-up, and satisfactory verification of the product components. Any component errors detected at the time of the OS installation should be promptly rectified, and the warranty period should be correspondingly extended.
- 14. The vendor must provide a Manufacturing Authorization Form (certificate from the OEM for quoting the requirement).
- 15. Additionally, the vendor must provide three references where they have carried out installations of above 20 TFlops in the past 3 years. The Purchase Committee shall independently obtain inputs from the provided referees before arriving at a final decision.
- 16. The bids should have the option for further negotiations.

# **Eligibility Criteria:**

- 1. The bidding vendor (bidder) should be registered with the IISc vendor list.
- 2. The bidder/OEM should have set up at least 3 or more HPCs above 20 TFlops in the last 3 years. Reference and purchase order copies of previous installations are required.
- 3. OEM should have installation/service center base in Bangalore for such units and a fully equipped service center. Kindly provide details of Karnataka Registration and Office Address.
- 4. Bidder/OEM has to quote exactly as per mentioned specifications for entire solution, partial offers will not be accepted.



#### **Tender specifications:**

The proposal should comprise of two parts: A Technical Bid (Part I) and a Commercial Bid (Part II). Both parts should be identical in every respect, except that the Technical Bid (Part I) will not contain information about the price. The Technical Bid should also have an item-wise compliance report of all the specifications. The Commercial Bid must have itemized pricing information for each component in the Technical Bid. The two parts should be sealed in separate envelopes and marked "Technical Bid" and "Commercial Bid" respectively. Both bids should be finally put into one envelope, which should be marked "Bid for High Performance Computational Cluster for Dr. Govardhan Reddy (Solid State and Structural Chemistry Unit)". This final envelope is the one that should be submitted to the institute.

The prices quoted should include both rupee and US dollar quotes and should be inclusive of all taxes/duties. They should also be inclusive of the delivery of the items to the site as well as the installation at the site. Both technical and commercial bid will be negotiable for the lowest costing commercial bid and most desirable technical bid, weightage will be given for extensibility, performance and adherence to specifications and references from past customers.

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.

With regards,

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