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Ref. No.: SSCU/GPR/T/2017-80

16 June 17

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

Dear Madam/Sir,

We 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 **03/07/2017**. All the quoted prices should be valid for a period of at least 90 days from the last date.

The bids should be addressed to:
The Chairman,
Solid State and Structural Chemistry Unit,
Indian Institute of Science (IISc),
Bengaluru, India - 560012.

The sealed envelope should be sent to:
Prof. Govardhan P Reddy,
Solid State and Structural Chemistry Unit,
Indian Institute of Science (IISc),
Bengaluru, India - 560012.
Phone: +91-80-22933533
Email: greddy@sscu.iisc.ernet.in; greddy.p@gmail.com

Important Dates:
Date of release of inquiry: 19/06/2017
Pre-bid enquiries up to: 23/06/2017
Last date of submissions: 03/07/2017, 5 PM

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Compute nodes with the following specification: Provide quotes for 20 nodes as essential specification. Optional specification of 16 nodes tender should also be submitted separately.

Specifications for each node

1a	Processors	10-core Intel Xeon E5-2640 V4 operating at 2.4 GHz
1b	Motherboard	Dual-socket type; the model should be specified in the bid.
1c	Core count Per node	10 core per processor * 2 processors per node = 20 cores per node
2	RAM per node	64 GB per processor; i.e. total memory = 64 GB * 2 processors = 128 GB per node
		All populated DIMMs should be 16GB or 32GB DDR4 2400MHz ECC Chips
3	HDD	Single 1 TB Enterprise hard disk per node; 7.2K RPM.

Other Specifications for the cluster

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 20U 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.

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

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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 rebuild able 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 performance of the benchmark calculations should be on par with the recent standard published benchmarks.

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 effect on the warranty of the existing or new machines. The absence of clear statements to this effect will lead to disqualification

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 the components that go in the server (RAM, HDD, etc.) must be tested and validated by the mother board manufacturer.

3. The entire solution should have redundant power supplies at least platinum level (94%).

4. The entire solution must be factory integrated. No on-site integration is allowed.

5. All equipment must be compatible with Indian Electrical Standards/Codes.

6. The vendor must carry out the installation, commissioning and cabling of all the hardware

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as well as software components.

7. 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.

8. Non-disclosure of various technical specifications listed above may lead to disqualification.

9. 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.

10. The servicing of the new and old nodes will be handled by the respective suppliers.

11. If any technical (OS installation or software) help is required, the suppliers of the old or the new nodes may be separately contacted.

12. The bid should be valid for at least 90 days from the last date of submission of the bids.

13. 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.

14. 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.

15. The competent authority reserves the right to reject the tender without assigning any reasons thereof.

16. 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.

17. During the warranty period, vendor will have to undertake comprehensive maintenance of the entire hardware, hardware components, equipment, software support and accessories supplied by the vendor at the place of installation of the equipment. The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. It should be completed within 2 working days for individual server and next working day for central components like power supply, networking and storage after the intimation of fault.

18. A letter of commitment for three years with respect to hardware support from the OEM and software support from the OEM should be enclosed in the cover for Technical bid. Offers will be rejected if they are not accompanied by the letter from OEM.

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19. 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.

20. The bids should have the option for further negotiations.

21. IISc will have the right to impose a penalty of 1% of PO value per week for delay under any of the following conditions:
   - Delay in delivery of hardware beyond scheduled delivery period.
   - Delay in successful installations/commissioning of system beyond scheduled period
   - Delay in fulfilling the Storage Benchmark as stipulated in Technical section.
   - Any delay in node warranty servicing beyond 2 days will incur a penalty of 0.5% of the total cost per day of delay.
   - The maximum penalty for non-performance will be 5% of the total cost. On reaching this limit in any year, the bidder will be considered in breach of the contract. The penalty will not apply if the delay is caused by IISc.

Eligibility Criteria:

1. The bidding vendor (bidder) should be registered with the IISc vendor list.

2. The bidder 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. The bidder 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. The bidder 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

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taxes/duties. They should also be inclusive of the delivery of the items to the site as well as the installation at the site.

Please note that IISc, being an academic institution with University status, is eligible for customs duty exemption. INR price should be specified with applicable TAX separately.

IISc may decide to increase/decrease node count at the time of negotiation based on budget availability. RBI price of dollar on the last date for submitting of tender will be considered for all calculations.

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.

Last date for submission of bids: 03 July 2017, 5 PM

With regards,

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