Dated: September 21, 2017
Revision date: October 5, 2017

Inquiry No.: CHE/VA/2017/002

Due Date: Oct. 13th, 2017

Re: Invitation to Quote for High Performance Cluster Nodes

Sealed quotations are invited for a master node and compute nodes with the specifications mentioned below. **Technical as well as commercial quotations must be sent separately in properly sealed envelopes to the address mentioned below before 5:00pm of the due date.** Quotations received after that time or in nonsealed envelopes will not be considered. Terms and conditions as well as detailed specifications are given below. Please contact us in case of doubts/clarifications.

Contact:

Prof. Vishal Agarwal/Prof. Indranil Saha Dalal
Department of Chemical Engineering
Faculty Building, Room 462
Indian Institute of Technology
Kanpur, India
Tel: +91 512 679 6895
Fax: +91 512 259 0104
Email: vagarwal@iitk.ac.in, indrasd@iitk.ac.in

Terms and Conditions:

1. The bids should be submitted in two bid systems (i.e.) Technical bid and Financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate item wise price for the items mentioned in the technical bid. The technical bid and the financial bid should be put in separate covers and sealed. Separate financial quotations should be provided for master node and compute nodes. The sealed envelopes with the quotes should be super scribed with the Inquiry number and whether it is a technical or financial bid.

2. The financial quotation for compute node should be made **on a per node basis.** The actual number of compute nodes to be bought may vary depending on our requirement at that time.

3. The bidder should separately provide an itemized price list for each hardware item, software bundle, service and warranty.

4. The bidder should quote unit prices for every component. The prices can be in INR or in valid foreign currencies (e.g. US Dollar). GST and any other applicable charges (for example shipping and installation) should be mentioned separately. IITK is exempted from payment of excise duty and the custom duty will be paid at concessional rate against exemption certificate.

5. The bids will be opened by a committee duly constituted for this purpose. The technical bids will

be opened first and it will be examined by a technical committee which will decide the suitability as per our specification and requirement. The financial bid will be opened *only* for the bids which meets all our technical requirements as per the specification and terms and conditions.

6. The bidder/OEM should have installed at least five (5) compute clusters at any academic institution in India in the last five years. Details of these previous installations must be provided in the technical bid.

7. The bidder should have registered support center in either Kanpur/Delhi/Lucknow. Documents for the same should be submitted along with the technical bid.

8. The bidder should be OEM/Authorized Partner/service provider of the OEM and a letter of authorization from OEM for the same and specific to the tender should also be enclosed.

9. The bidder should be financially sound to execute the order, its annual turnover of at least 10 crores each in the last three financial years.

10. OEM has to feature in the top 500 supercomputer sites (available at www.top500.org) with at least 10 installations in the June 2017 (Latest) list and at least five installations in each list published since last three years.

11. The bidder should implement the entire solution in 8 weeks time line after the award of tender. Any delay in delivery will have a penalty of 1 % of order value per week to total of 10% of order value. IITK reserve the right to cancel the order if it is not deployed even after that. Delay due to IITK will not be considered while computing total time of delay.

12. The bidder should give the power and cooling requirements for the cluster in the technical bid.

13. The bidder should provide a on-site warranty and support of minimum 3 years. Apart from that, installation and maintenance should be explicitly mentioned in the technical and the financial bid.

14. The bidder should provide minimum downtime (clearly mentioned in technical bid) with next business day reporting on-site.

15. The bidder should provide benchmarking reports of LAMMPS, GROMACS, and CP2K (or VASP) packages of the proposed intel architecture. The report should include the performance of atleast 1-core, 8-cores, 24-cores, 48-cores and 96-cores. *The files to be benchmarked can be downloaded from https://drive.google.com/drive/folders/0B_ eF2W9rlUeeMFVPd3FrMzdZaFU?usp=sharing or available on request.*

16. The bidder should install the full cluster, and essential software like MPI, g++, gcc, python etc. The bidder should install and optimize parallel performance of the following software: CP2K, Gaussian09-Linda, LAMMPS, GROMACS, ANSYS FLUENT, COMSOL.

17. The bidder is also required to maintain integration of licensed software (for example VASP, COMSOL) with the cluster throughout the warranty period.

18. Equivalent (or better) hardware/software can be allowed at the discretion of IIT Kanpur. However, in such cases, the bidder must provide sufficient justification for the deviation from the specifications given here.

19. Terms and conditions should be clearly mentioned in the technical bid. The deviations should be clearly stated with proper justifications with the signature of the responsible person.

20. IIT Kanpur has the right to accept the whole or any part of the tender or portion of the quantity offered or reject it in full without assigning any reason.

21. *Maximum educational discount should be offered and mentioned.*

22. Quotations should be valid for a minimum period of 3 months.

Deliverables:

A) <u>Head Node:</u> 1 No.

Item	Description of Requirement
CPU	2 x Intel® Xeon® Scalable Processors, Gold 6126, 2.6 GHz, 12-core, 24-thread, 19.25MB L3
Chipset	Intel C621 or higher
Memory	128GB DDR4 Registered ECC expandable to 256GB or more
Optical Drive	DVD-RW drive
HDD	40TB usable space using 4TB/6TB/8TB 7200RPM Enterprise SATA hot-pluggable HDDs, at least 12×3.5" Hot-swap HDD bays or more
RAID	On board or AOC Hardware SAS RAID Controller with RAID levels 0,1, 10, 5, and 50 supported and atleast 1GB cache
Expansion Slots	6(or more) ×PCIe Gen3 slots (3 × PCIe 3.0×8 or more and 2 × PCIe 3.0×16 or more), should support GPU-NVIDIA for future
Graphics	On-board graphics using server grade graphics controller
Networking	4×1Gb Ethernet BaseT Ports, Dedicated remote management port
Infiniband port	Single port 100Gb/s (EDR) Infiniband card
Chasis	2U Rack Mountable Chassis, capable of getting rack-mounted in a standard 19" 42U Rack, Rack mounting kit.
Power Supply	Redundant Hot Swap Power Supply Unit, Power supply with 80 PLUS Platinum (or Titanium) compliance
Fans	Redundant Hot Swap Fans

B) Compute Nodes: 5 Nos.

Item	Description of Requirement
CPU	2 x Intel® Xeon® Scalable Processors, Gold 6126, 2.6 GHz, 12-core, 24-thread, 19.25MB L3
Chipset	Intel C621 or higher
Memory	128GB DDR4 Registered ECC expandable to 256GB or more
HDD	1 x 1 TB Enterprise SATA 7200 RPM HDDs
Expansion Slots	4×PCIe Gen3 slots (atleast 2 × PCIe 3.0×16)
Networking	2×1Gb Ethernet BaseT Ports
Infiniband port	Single port 100Gb/s (EDR) Infiniband card
Chasis	1U/2U Maximum, rack-mountable with sliding rails, Rack mounting kit.
Power Supply	Redundant Hot Swap Power Supply Unit, Power supply with 80 PLUS Platinum (or Titanium) compliance
Fans	Redundant Hot Swap Fans

C) Infiniband EDR Switch: 100 Gb/s 36-port infiniband switch with required number of cables to connect masternode, and computing nodes. Should be compatible with OFED (Open Fabric Infiniband stack), OpenSM, OpenMPI. Single chassis mountable in standard 19" rack. Rack mounting kit should be provided. All software/firmware/drivers should be supplied. Appropriate length QSFP Cable to be supplied. Numbers and length should be specified in the quotation.

D) Gigabit Ethernet Switch : 24 port or higher port 10/100/1000 Mbps Ethernet switch with auto sensing of link speed on all ports 19" rack mountable Appropriate length cables to be provided; numbers and length should be specified in the quotation.

E) Console (rack mountable): 1× 18.5" (or anywhere in-between 18.5" and 21") LCD monitor, 1× keyboard, 1× mouse.

F) Server Rack: Server rack to accommodate all the nodes and storage with all required accessories. Server rack should be from the same OEM of servers & storage.

G) UPS: 1 No. 15 KVA (or higher) UPS with at least 20 mins backup for the cluster (another 5 compute nodes should be factored in). Provisions should be made so that head node automatically shuts everything down on more than 10 mins of power cut. Provisions of automatic shutdown should also be made for excessive rise in temperature.

H) Software & Drivers:

(1) **Operating System:** Open source Red-Hat based CentOS 64-bit.

(2) **Cluster Tools & Job Scheduler:** OpenPBS/Open GridEngine should be installed for queue management. Configuration of scheduler, queues, and policies; policies (like group resource allocation) should be discussed with any of the contacts above at IITK before installation process.

(3) **Compilers & Libraries:** The bidder should quote for Intel compilers (academic version). Installation and integration of Intel compilers and standard open source compliers such as gcc, g++, gfortran, openMPI.

(4) **Training & Documentation:** Cluster usage training should be provided to the end users. Proper documentation of everything installed and its usage needs to be provided.

(5) **Testing:** Finally, testing and verification of the complete setup is required.