

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR**  
Department of Chemistry

Enquiry NO: dlvkp/chm/02  
Enquiry Date: 22<sup>nd</sup> Nov 2013  
Submission Date: 28<sup>th</sup> Nov 2013, 1300 hours

Formal quotations are invited for HPC cluster.  
Detailed specifications are given below. The following points may kindly be noted and technical compliance should be clearly stated in the quotation:

**SPECIFICATIONS**

**A) Head Node (Rack server)**

**Qty 1**

<b>Form factor/height</b>	2U Rack
<b>Processor</b>	Two 8-core Intel Xeon E5-2650V2 @ 2.6GHz IvyBridge processors
<b>Cache</b>	20 MB per processor
<b>Memory</b>	64GB RAM DDR3, 1866MHz
<b>Media bays</b>	DVD Drive
<b>Disk</b>	5*4TB SATA, 7200RPM HDD configured with Raid-0, -1, -10, -5, -6, -50, -60
<b>Network interface</b>	4 x 1 GbE ports, Dual FDR Infiniband port
<b>PCIe 3.0 Slots</b>	4 - 6 PCIe Gen 3 slots
<b>Power Supply</b>	Redundant and Hotswap with 80 PLUS Platinum compliance
<b>Fans</b>	Redundant and Hotswap
<b>Systems management</b>	IMM2, Predictive Failure Analysis, Diagnostic LEDs, light path diagnostics panel, Automatic Server Restart.
<b>Operating systems Certified</b>	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server
<b>Trusted Platform Module</b>	TPM 1.2 Certified

**B) Compute Nodes**

**Qty 12**

<b>Processor</b>	Two 8-cores Intel Xeon E5-2650V2 @ 2.6GHz IvyBridge processors
<b>Cache</b>	20 MB per processor
<b>Memory (max)</b>	64GB DDR3 RAM, 1866MHz
<b>Disk (Disk Capacity)</b>	1x500 GB SATA per node, 7200RPM Disk (if available 1 TB SATA is preferable)
<b>Network interface</b>	2 x 1 GbE (std.), Dual InfiniBand FDR port, single PCI slots spare
<b>Power supply</b>	80 PLUS Platinum compliance. Redundant and Hotswap
<b>Fans</b>	Hotswap
<b>System management</b>	IMM2, Predictive Failure Analysis, Diagnostic LEDs, light path diagnostics panel, Automatic Server Restart. Virtual media and bios level management support must
<b>Trusted Platform Module</b>	TPM 1.2 Certified

<b>Operating systems certified</b>	<i>Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Microsoft Windows Server 2008 R2</i>
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**C) Infiniband FDR Managed Switch - 1**

*36 ports 4x FDR Infiniband switch configured in 100% non-blocking Fat Tree Topology to support servers in solution*

*Compatibility with OFED (OpenFabric Infiniband stack), OpenSM and OpenMPI; should provide full quoted performance on open source software (Linux-OFED-OpenMPI)*

*19" rack mountable*

*All software/firmware/drivers should be supplied*

*Appropriate length QSFP Cable to be proposed*

**D) Ethernet managed L2 switch - 1**

*48 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*

**E) 36 ports KVM switch with 1U Monitor**

**F) Operating System (Linux Open source)**

**G) Cluster Management software (Open source-Rocks)**

**H) Job scheduling software (Open source – SGE or Open PBS or HT Condor)**

**I) Compilers, Libraries and MPI (GNU open source)**

**J) Server Make: IBM/HP/Dell**

**General Terms and Conditions:**

The vendor should give the power and cooling requirements for the cluster solution along with the proposal.

- Equivalent (or better) hardware/software can be allowed at the discretion of IIT.

However, in such cases, the vendor must provide sufficient justification for the deviation from the specifications given here.

- Warranty period (minimum 3 years comprehensive on-site).

- The vendor should be able to install and integrate (in parallel) Linux operating system with open source cluster management software. Standard open source (or free academic version) compilers for C/C++ and FORTRAN, and open source mathematical libraries like BLAS, ATLAS, MPI, Open MP, Pthreads libraries should also be installed. A batch job queuing system like Open PBS or SGE or HT Condor has to be installed and configured. The vendor is also required to maintain integration of software [VASP, Quantum ESPRESSO, NWChem, G09, and ABINIT] with the cluster throughout the warranty period. Cluster benchmarking should be done with LINPACK.

- The quoted prices can be in INR or in valid foreign currencies (e.g. US Dollar). For INR quotations, delivery should preferably be up to IIT K. Sales Tax, VAT and any other applicable charges should be mentioned.

- Installation and maintenance charges should be mentioned separately.

- Technical and Commercial quote should be in separate envelop.

- Terms and Conditions, and deviations should be clearly stated with the signature of the responsible person.

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