

## Mq-12

### Technical Specifications: High Performance Computing Rack Servers

#### Manufacturer Eligibility Criteria:

1. OEM must have presence in Top 500 supercomputers listed at top500.org (necessary proof of document to be enclosed with tender).
2. Only OEMs should quote. If an OEM aligns with a business partner, then it should be one business partner per OEM (Authorization letter from OEM should be submitted in this regard).

#### Bidder Eligibility:

1. Bidder should have minimum 10 years of Experience in HPC Business. Proof of Purchase Order along with successful installation report must be submitted.
2. The Bidder should have registered support office with dedicated HPC Service Engineers capable of handling all HPC related issues. Necessary proof of employment should be submitted along with Certification (if any).
3. In the last 5 years, the Bidder must have installed a total of at least 1000 CPU cores in India. Order copy and work completion certificate from the client should be attached.

#### Technical Specifications

<b>1</b>	<b>Computing Power</b>	<ul style="list-style-type: none"><li>▪ At least <b>10 TFlops</b> of compute power in double precision.</li><li>▪ Minimum of <b>240 CPU cores</b>.</li><li>▪ At least <b>2 CPUs per node</b>.</li><li>▪ Minimum <b>6 dual socket CPU nodes</b>.</li></ul>
<b>2</b>	<b>CPU Specifications</b>	<ul style="list-style-type: none"><li>▪ Clock at least <b>32</b> instructions per core per cycle.</li><li>▪ At least <b>20 or more cores per socket with 2.2 GHz</b> or higher frequency.</li><li>▪ <b>Intel or equivalent CPU chips</b> are mandatory for integration with the existing Intel based servers.</li></ul>
<b>3</b>	<b>Memory Specifications</b>	<ul style="list-style-type: none"><li>▪ At least <b>4 GB DDR4 RAM</b> per CPU core on each compute node with <b>2666 MHz or higher</b> frequency if supported by CPU.</li><li>▪ A maximum of <b>16 GB DDR4 RAM</b> must be installed per slot across all the nodes.</li></ul>
<b>4</b>	<b>Storage</b>	<b>600 GB 15K RPM SAS HDD</b> per node.
<b>5</b>	<b>Interconnect</b>	<b>Intel Omni path network adapter 100 GB/s</b> ( <u>to connect with the existing Intel Omni path Switch</u> )

<b>6</b>	<b>Internet Connectivity</b>	Network Card with at least 1G bandwidth.
<b>7</b>	<b>Mounting</b>	<ul style="list-style-type: none"> <li>▪ Rack mountable with suitable mounting kit.</li> <li>▪ <b>1U/2U</b> Form Factor.</li> <li>▪ Redundant power supplies for all nodes.</li> <li>▪ One free PCI-e slot for future expansion.</li> </ul>
<b>8</b>	<b>Operating System</b>	Licensed CentOS 7.6.1810 variant (64-bit Linux) to be compatible with the existing server.
<b>9</b>	<b>Compilers, Libraries, and tools</b>	Support for the complete software suite including all the software currently supported on the existing server at IITM (Abaqus, Comsol, Mathematica, Gaussian, Nastran, Dytran, Marc, Ansys/fluent, DAMASK, NAMD, VASP, LAMMPS, GROMACS, AMBER, Accelerlys, MATLAB.) along with various compilers (such as GNU GCC collection, Intel, Java compiler etc.).
<b>10</b>	<b>Software Reliability</b>	Software failover for critical system services including. system database, system logger and batch file systems, parallel file systems.
<b>11</b>	<b>Support</b>	Submit the specifics of your 24x7 support in terms of response and resolution time for various types of problems in the HPC cluster.
<b>12</b>	<b>Compliance</b>	Compliance statement needs to be provided by the bidder clearly specifying COMPLY/NON-COMPLY with remarks of all the points mentioned earlier
<b>13</b>	<b>Installation</b>	<ul style="list-style-type: none"> <li>▪ The hardware must be factory integrated, installation of the hardware, OS, software components must be done by trained engineers.</li> <li>▪ The installation of the OS (mentioned above), software packages, device drivers must be carried out on each compute node.</li> <li>▪ The full integration (hardware and software) of the existing server should be carried out on the new compute nodes by installing the necessary software packages or modifications to the job scheduler, SSH and other package settings in the head/master node.</li> </ul>

**Conditions:**

1. The total cost must include all the components of the whole system. Each bid should specify the details of the configuration and should specify the cost of each component. The final cost should include any and all additional items required to make the system functional, pass the tests and function normally. IIT Madras will not pay any additional amount to the vendor for the supply and installation of this system.
2. Quotes are requested by **two-bid system Technical bid separate cover & Financial bid separate cover combined in single big cover.**
3. A separate compliance **certificate/sheet should be attached** indicating whether the proposed system meets above said specifications along with necessary details.
4. **Entire HPC solution including each software, firmware and hardware component should have at least 5 years warranty from the HPC solution provider, from the date of acceptance.** During warranty period the vendors will attend to any complaint such that the cluster is restored to operational condition within 24 hours and the full performance is restored within 72 hours.

**Compliance Sheet**

<b>S.No.</b>	<b>Features</b>	<b>Requirements</b>	<b>COMPLY /NON-COMPLY</b>
<b>1</b>	<b>Computing Power</b>	<ul style="list-style-type: none"> <li>▪ At least <b>10 TFlops</b> of compute power in double precision.</li> <li>▪ Minimum of <b>240 CPU cores</b>.</li> <li>▪ At least <b>2 CPUs per node</b>.</li> <li>▪ Minimum <b>6 dual socket CPU nodes</b>.</li> </ul>	
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9	<b>Compilers, Libraries, and tools</b>	Support for the complete software suite including all the software currently supported on the existing server at IITM along with various compilers (such as GNU GCC collection, Intel, Java compiler etc.).	
10	<b>Software Reliability</b>	Software failover for critical system services including. system database, system logger and batch file systems, parallel file systems	
11	<b>Support</b>	Submit the specifics of your 24x7 support in terms of response and resolution time for various types of problems in the HPC cluster.	
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