

Tender notification for the procurement of a “40 Tera Flops High Performance Computing Cluster” (Last date: 25th November 2019 by 5:00 pm)

Dear Sir/Madam,

In order to accomplish the goals of a government funded project, we plan to acquire a **HPC cluster solution with a minimum peak performance of 40 tera flops from the COMPUTE NODES**, allowing for large-scale simulations. The HPC cluster must be a **combination of Low and High memory** compute nodes (see below for the details), having **minimum 30% high memory nodes**. In the following, we list the minimum specifications that we insist upon in the solution.

Master Node

#	Heading	Specifications
1	Form Factor	2U Rack mountable Chassis
2	Processor	Minimum Clock Speed 2.4 GHZ, Minimum number of cores 40C/80T (per node)
3	Memory	Minimum 8GB/core DDR4 RDIMMS in balance mode, 2933MHz or better
4	USB ports per nodes	Minimum 2 USB 3.0 or better
5	Video o/p per node	One Onboard VGA port or better
6	Storage	<ul style="list-style-type: none"> i) SSD - Minimum 1 TB ii) Minimum 7 numbers of 12 TB 6Gbps Enterprise SATA HDD @7200 iii) 1x RAID controller – 8 internal SAS/SATA ports – RAID levels 0,1,5,6,10,50,60 with minimum 2GB cache
7	High Speed Interconnects	Dual Port 100Gbps EDR InfiniBand
8	Power Supply	<ul style="list-style-type: none"> I. Redundant power supply of 80 Plus Platinum level. II. The minimum PSU wattages should be suitable for the provided solution. III. A supporting calculation of the power utilization of the solution and PSU sufficiency must be provided.
9	OS Support	<p>The System Should Support</p> <ul style="list-style-type: none"> a) Microsoft Windows Server 2012 and Later versions b) RHEL 7.X and Above c) SUSE Recent Version d) UBUNTU and Centos of Recent Version

Low Memory CPU Compute Node

#	Heading	Specifications
1	Form Factor	1U/2U Rack mountable Chassis
2	Processor	Minimum Clock Speed 2.4 GHZ, Minimum number of cores 40C/80T (per node), Maximum 2 cpus per nodes
3	Memory	Minimum 8GB/core DDR4 RDIMMS in balance mode, 2933MHz or better
4	USB ports per nodes	Minimum 2 USB 3.0 or better
5	Storage	Minimum 450 GB SSD
6	Video o/p per node	One Onboard VGA port or better
7	High Speed Interconnects	Dual Port 100Gbps EDR InfiniBand
8	Power Supply	<p>I. Redundant power supply of 80 Plus Platinum level.</p> <p>II. The minimum PSU wattages should be suitable for the provided solution.</p> <p>III. A supporting calculation of the power utilization of the solution and PSU sufficiency must be provided.</p>
9	OS Support	<p>The System Should Support</p> <p>e) Microsoft Windows Server 2012 and Later versions</p> <p>f) RHEL 7.X and Above</p> <p>g) SUSE Recent Version</p> <p>h) UBUNTU and Centos of Recent Version</p>

High Memory CPU Compute Node

#	Heading	Specifications
1	Form Factor	1U/2U Rack mountable Chassis
2	Processor	Minimum Clock Speed 2.4 GHZ, Minimum number of cores 40C/80T (per node), Maximum 2 cpus per nodes
3	Memory	Minimum 24GB/core DDR4 RDIMMS in balance mode, 2933MHz or better
4	USB ports per nodes	Minimum 2 USB 3.0 or better
5	Storage	Minimum 450 GB SSD
6	Video o/p per node	One Onboard VGA port or better

7	High Speed Interconnects	Dual Port 100Gbps EDR InfiniBand
8	Power Supply	<p>I. Redundant power supply of 80 Plus Platinum level.</p> <p>II. The minimum PSU wattages should be suitable for the provided solution.</p> <p>III. A supporting calculation of the power utilization of the solution and PSU sufficiency must be provided.</p>
9	OS Support	<p>The System Should Support</p> <p>a) Microsoft Windows Server 2012 and Later versions</p> <p>b) RHEL 7.X and Above</p> <p>c) SUSE Recent Version</p> <p>d) UBUNTU and Centos of Recent Version</p>

Primary Interconnect

#	Heading	Specifications
1	Primary Interconnect Switch	Mellanox InfiniBand® EDR 100Gbps 36 SFP port switch with Dual power supply port switch with Dual power supply to be provided corresponding to the High speed connectivity adapter used in the Compute nodes. All Drivers of the Switch be provided to setup the cluster on the latest version of Linux

Management Interconnect

#	Heading	Specifications
1	Management Interconnect Switch	48 port 1GbE BaseT Managed Switch with low latency and SFP uplink port of popular brand

Rack Enclosure

#	Heading	Specifications
1	Size	42 U x 1000mm x 600 mm
2	Material	1 mm Mild Steel
3	Sides	Louvered ventilated side cover with locks
4	Front	Honeycomb perforated single door with lock and handle
5	Rear	Honeycomb perforated single door with lock and handle
6	Mobility	4 Castor Wheel with two having breaking locks
7	Locator	2 Levelling feet to adjust floor errors and station the rack in place

8	PDU	30 C-14 socket PDU in 3-Phase with single MCB-No cable.
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Other requirements

1. The minimum peak performance of the HPC cluster should be 40 tera flops.
2. Minimum three years warranty on all components should be included in the quoted cost. The warranty cost for two subsequent years should be mentioned separately.
3. OS installation and software installation support.
4. For Intel based solution, please quote Intel Parallel Studio XE Cluster Edition for Linux – Floating Academic 2 Seats for 3 Years (ESD) – To be installed with the cluster.
5. For AMD based solution, please quote commercially supported software suite - 2 seat floating license with 3 years support – compilers – C/C++/Fortran , libraries – BLAS, SCALAPACK, LAPACK, MPI, performance profiler, debugger, MPI tuning and Analysis etc..
6. For IBM Power based solution, please quote commercially supported software suite - 2 seat floating license with 3 years support – compilers – C/C++/Fortran , libraries – BLAS, SCALAPACK, LAPACK, MPI, performance profiler, debugger, MPI tuning and Analysis etc.
7. Per node LINPACK benchmark performance with the quoted software suite should be provided for quoted solution.

In case of a price conflict, the vendor with the following options will be preferred in the following order of priority;

1. Offer of higher additional warranty.
2. Higher clock speed cpus.
3. Newer generation cpus.
4. Higher memory at 2933 MHz.
5. Extra SSD storage.

Terms and conditions

1. The vendors quoting should be registered with IISc. The quote should carry your vendor Registration number in the Technical bid.
2. Two-bid system (separate technical and financial bids) in sealed envelopes.
3. The technical bid must clearly specify the prescribed technical specifications without including the prices. Please provide in detail the specifications under each subhead and bullet point. Unique characteristics may be highlighted.
4. Vendors who include price information in the technical bids will be automatically disqualified.
5. At least 3 independent reference letters from installations worldwide. IISc may contact more users for obtaining independent references. The committee will have right to reject a bid based on reference letters.
6. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids and may ask vendors to perform some example experiments on the samples given by IISc to demonstrate the promised technical specifications. Vendors may be required to give presentations.
7. There are several items that require detailed information to be provided by the supplier. If information is not provided against any of these items, this will disqualify the supplier.
8. Please mention per node cost in the bill of materials.
9. Any additional nodes has to be supplied at the same cost quoted in the original bid.

10. Price bids of only technically qualified vendors will be considered.
11. The price bids must offer CIF Bangalore prices.
12. Prices should be quoted in adequate detail with relation to packing details to cover insurance compensation in case of damage to any specific modules.
13. Indicate separately price of spares listed above in terms of unit cost.
14. IISc also reserves the right to cancel the tender at any time without assigning any reason whatsoever.
15. Indicate delivery period.
16. Order will be placed on lowest bid from technically qualified vendor.
17. Delivery and installation of the supply shall be complete responsibility of the vendor.
18. Prices may be quoted in US Dollars, IISc is eligible for custom duty exemption/concession.
19. In case of rupee offer, the component of GST/VAT/CST, E.D. and any other statutory levies if applicable should be shown separately and not included in the total amount, to enable us to avail exemption. IISc is eligible for 5% GST under concessional certificate.
20. The total solution as per the agreed bill of materials has to be supplied within 6 weeks after receiving a firm PO from IISc and the installation to be complete within a week after supply of the equipment.
21. Payment will be processed only after successful installation of the machine (both hardware and software).
22. The tender documents can be sent at the following address not later than 20th November 2019 5:00 pm:

The Chairman
Materials Research Centre
Indian Institute of Science, Bangalore 560012
Karnataka (INDIA)
Attn: Prof. Abhishek Kumar Singh