



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**  
**MATERIALS MANAGEMENT DIVISION**  
Powai, Mumbai - 400076

**Technical Specifications of Computational facility**  
**RFx No. 6100001121 (Reference No.1000025352)**

The facility should meet (or exceed) the following minimum specifications. If there are specific items (related to particular OEM), which is required beyond the following list for successful performance of the cluster, then those should be mentioned and provided.

Only OEMs and their authorized vendors (with OEM products) are allowed to participate in the tender.

Technical Specifications:

**1. Master node [Quantity:1]**

Sl No	Item description	Specification	
1.1	Chassis rack mount	1U/2U form factor	
1.2	Processor	2 nos. x AMD EPYC 7313 (16C/32T , 3.0 GHz , 128M)	
1.3	Chipset	System on Chip	
1.4	RAM	128 GB (4 x 32GB) DDR4-3200 ECC RDIMM. <b>At least 4 additional DIMM slots should be available for future expansion.</b>	
1.5	SSD (For OS)	2 X 480 GB SATA SSD	
1.5	HDD (for data)	04 nos. x 8 TB (Total 32 TB RAW) SATA Enterprise 7200 RPM 3.5" HDD. <b>Free slots for additional HDD should be available for future expansion.</b>	
1.6	RAID	SAS Gen-3 (12 Gbps) RAID controller for RAID 0, 1, 5, 6, 10, 50 and 60	
1.7	Management	IPMI over LAN and KVM over LAN support	
1.8	NIC:	Dual 10GBase-T Lan ports or better if required	
1.9	PCI Slots:	3 PCI-E 4.0x8 slots or better	
1.10	Ports:	2xUSB 3.0, 2xUSB2.0, 1xVGA, management port	
1.12	Video	ASPEED AST2600 BMC or better	
1.11	Power supply:	Redundant power supply and hot-swap	
1.12	Fans	Redundant and hot swap	
1.13	Optical drive:	1x DVD RW	
1.14	Infiniband provision	Provision for Infiniband should be available for future up-gradation	

1.15 Primary Interconnect :  
Description :- At least 10-ports 10GBASE-T

1.16 Secondary Interconnect :  
Description :-2 Nos of at least 16-port 1G Gigabit Ethernet switch

1.17 Rack: Standard 42U rack is already available with PI (Pl. visit and check the spec if required) :  
No need to quote for that. But you have to supply accessories for the rack if required. You have to quote for those accessories.

1.18. Other accessories: All OEM specific accessories to run the cluster successfully even if not mentioned in the above are to be quoted and supplied.

**1.19. Warranty: 5 years warranty on all the components from the date of installation.**

## **2. Compute Node configuration [Quantity 6 (PI preserves right to downsize)]:**

**Cost of each node should be mentioned**

<b>Description of compute nodes</b>			
2.1	Chassis rack mount	1U/2U form factor	
2.2	Processor	02 nos. x AMD EPYC Rome 7443 (24C/48T , 2.85 GHz , 128 M ). Total 48 core per node	
2.3	Chipset	System on chip	
2.4	RAM	(Total 192 GB) DDR4-3200 ECC RDIMM. <b>At least 4 free DIMM slots should be there for future expansion.</b>	
2.5	SSD	02 nos. of 960 GB SATA SSD	
2.6	RAID	SATA Gen-3 (12 Gbps) Onboard Controller for RAID 0 AND 1	
2.7	Management	IPMI 2.0 with virtual media over LAN and KVM over LAN support On-board	
2.8	NIC	Dual 10GBase-T Lan ports or better if required	
2.9	PCI Slots	At least 1xPCI-E 3.0x8 or PCI-E3.0 x16	
2.10	Ports:	2xUSB 3.0, 1xVGA, 2xUSB2.0, management port	
2.11	Power supply	Redundant and hot-swap power supply	
2.12	Fans	Redundant and hot-swap	
2.13	Mount type	Rack mount rail kit	

**2.14 . Warranty: 5 years warranty on all the components from the date of installation.**

## **Other terms and conditions**

1. The bidder should give the power and cooling **requirements** for the cluster solution along with the proposal.
2. Upon winning the tender, vendor shall complete the installation of the cluster in two months.
3. Post installation, the bidder has to take the responsibility to successfully run one widely used CFD related software namely **CFDEM** (<https://www.cfdem.com/4-way-unresolved-cfd-dem>) **with 1 second wall time for 100000 particles in 100 cpu cores.**

Above open source software will be available in:

[https://www.cfdem.com/media/CFDEM/docu/CFDEMcoupling\\_Manual.html](https://www.cfdem.com/media/CFDEM/docu/CFDEMcoupling_Manual.html)

It is suggested that the vendor should go for that testing before submitting bid to avoid post installation complexity.

4. OEM can quote either directly or through an authorized partner or service provider. **Locally assembled systems are not acceptable.** Motherboard and chassis should be OEM certified.
5. **OEM should have a total of at least three entries in the world's "Top 500 super-computer (Top500.org)" list with in a span of 2019-2021.**
6. **Both the OEM and the bidder should have at least one entry in each of the January-2021, July-2021, and January-2022 lists of supercomputer-India (<http://topsc.cdac.in/topsc.php>).**
7. **The firm (vendor/bidder) should have directly supplied and installed at least 3 nos. Of Cluster with at least 100 CPU cores or higher in any R&D and/or Premier Educational Institutions within the last 2 years (2020-2021). PO copies and installation reports must be attached with the bid.**
8. **The bidder will have to declare in their letter head that there is no imposition of ban/blacklist on them by any of the R&D organization or academic institute of MoE, INDIA or Govt. of INDIA.**
9. Point by point compliance to all the above mentioned features should be provided by the firm. Details of deviation if any must be clearly stated.
10. **The prices should be mentioned separately for the each compute node.**
11. Full Server should be tested and integrated at OEM manufacturing plant which includes all major components, power supply, cooling fan cabinet etc. No local site integration of server components will be allowed. Only Cluster integration and software stack installation is allowed at site.
12. Bidder should be ISO certified company. OEM/Bidder should have support center in Mumbai/Pune or nearby city for quick and adequate service and support.
13. The firm (vendor) must be authorized by the manufacturer (OEM) to supply, install and maintain the system. The specific authorization by the manufacturer for participating in this tender should be enclosed, otherwise quotation may be rejected.
14. The bidder/vendor must agree to install and configure the user sought operating systems, mostly

open source Linux versions, MPI libraries, Job schedulers plus cluster management tools and demonstrate its running in parallel as part of the system acceptance during warranty period. Installation and maintenance charges, if any, should be included in the cost.

**15. The vendor will have to take the responsibility of the complete installation of open source application software like “OpenFOAM”, LIGGHTS, CFDEM etc.**

**16. Bidder/OEM should provide on site warranty for at least 5 years. In case of faulty and non functioning hardware needs to be replaced any time during 5 years within not more than 2 weeks.**

17. OEM/vendor should keep provision for fixing higher RAM, HDD and InfiniBand connectivity. Vendor is requested to clearly state about the number of free slots for those.

**18. Proposed system should be such that there will be provision to integrate/upgrade the present one to a cluster of 10 nodes in future with InfiniBand connectivity.**

**19. If the technical specification and other terms and conditions are not satisfied, the bid will straightway be rejected.**