Technical Specification :

Computational facility with uninterrupted power supply

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]

SI No	Item description	Specification
1.1	Chassis rack mount	1U/2U form factor
1.2	Processor	2 nos. x Intel Xeon Silver 4208 (8C/16T , 2.1 GHz , 11M,
1.3	Chipset	Intel C621
1.4	RAM	64 GB (4x16GB/ 8x8 GB) DDR4-2933 ECC RDIMM, Should have at least 10 DIMM slot
1.5	HDD	04 nos. x 8 TB (Total 32 TB RAW) SATA Enterprise 7200 RPM 3.5" HDD
1.6	RAID	RAID 0,1,5, and 10
1.7	Management	IPMI 2.0 with virtual media over LAN and KVM over LAN support On-board
1.8	NIC:	Dual Gigabit Ethernet ports or better if required
1.9	PCI Slots:	1xPCI-E 3.0x8 or x16 FHHL
1.10	Ports:	1x serial, 2xUSB 3.0, 1xVGA, 2xRJ45 LAN ports, 1xRJ45 management port
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	Provision for future:	Free slots for Infini Band connection in future. Free slots for extension of rams and HDD

2. Compute Node configuration [Quantity 3 (Indenter <mark>preserves right to downsize)</mark>]:

Cost of each node should be mentioned

Description of compute nodes		
2.1	Chassis rack mount	1U/2U form factor
2.2	Processor	02 nos. x Intel Xeon Gold 6230 (20C/40T , 2.1 GHz , 27.5M , 125W , 10.40 GT/sec) Total 40 core per node
2.3	Chipset	Intel C621 or better
2.4	RAM	(Total 128 GB) DDR4-2933, At least 4 free DIMM slots should be there for future expansion.
2.5	HDD	2x 2 TB SATA Enterprise, 7200 RPM, At least one bay should be free.
2.6	RAID	RAID 0, 1, 5, and 10
2.7	Management	IPMI 2.0 with virtual media over LAN and KVM over LAN support On-board
2.8	NIC	Dual Gigabit Ethernet ports or better if required
2.9	PCI Slots	At least 1xPCI-E 3.0x8 or PCI-E3.0 x16
2.10	Ports:	1x serial, 2xUSB 3.0, 1xVGA, 2xRJ45 LAN ports, 1xRJ45 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

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3. Switch: 24 port Gigabit Ethernet switch
4. Console: 24" monitor, Keyboard and mouse
5. Switch for connecting all the nodes with Monitor (at least 8 nodes can be connected)

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6. **Uninterrupted power supply facility** (On line UPS 6 KVA with 1-hour backup at full capacity. If rack for battery is required, that should be provided) :
Warranty on UPS: 3 years, warranty on batteries: 2 years

7. External backup drive (WD/Seagate) (including power adopter if required)
Capacity: 8 TB, Quantity:1

Rack: Standard 42U rack is already available with PI (Pl. check the spec if required) : No need to quote for that
Other accessories: All OEM specific accessories to run the cluster successfully even if not mentioned in the above. Uninterrupted

Warranty: 5 years warranty on all the components (except item 6) from the date of installation.

1. The bidder should give the power and cooling **requirements** for the cluster solution along with the proposal.

2. Upon winning the tender, vendor will 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 40000 particles in 30 cpu cores. Submit *.liggghts and .vtk files. Example problem: Bubbling fluidized bed**==

==Above open source software will be available in:==
==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. The vendors are required to quote Servers of the **branded/MNC make only**. OEM can quote either directly or through an authorized partner or service provider. **Locally assembled systems are not acceptable**. Motherboard and chassis should be from the same OEM and should be certified.

5. OEM should have at least one entry in the world's "Top 500 super-computer (Top500.org)" list with in a span of 2017-2019

6. OEM should have   entries in top supercomputer-India July, 2019 (http://topsc.cdacb.in/jsps/july2019/index.html).

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 (2017-2019).   PO copy and installation report must be attached with the bid.

8. Both the bidder and the OEM 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 MHRD, 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 nodes.==

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 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 (Except item 6, for which it is 3 years on UPS and 2 years on batteries). In case of faulty and non functioning hardware needs to be replaced any time during 5 years (except item 6; for which it is 3 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. Bidder will have to put technical and financial bid separately.

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

21. PI preserves right to downsize the equipment.