

**SUB : FINAL AND FROZEN TECHNICAL SPECIFICATION  
FOR DISPLAY ON CSIR-IICB'S WEBSITE.**

**REF : PRE-BID CONFERENCE HELD ON 06.09.2017 AT  
03:00 PM (IST) AT IICB, KOLKATA.**

Sl. No.	Name of the Item/Description	Quantity	Earnest Money Deposit (EMD) to be submitted along with Technical Bid		
1.	Enq No. IICB/PUR/536/575/74/2017-18	01 Unit	INR ₹	US \$	Euro €
	High Performance Computing GPU Cluster		40,000-00	630-00	530-00
Last date and time of Submission of bids/quotations by the prospective bidders in Two-Bid format as per tender document against final/frozen technical specifications by CSIR-IICB after Pre-Bid Conference		03.10.2017 upto 01:00 PM (IST)			
Date and Time of Opening of Technical Bids		03.10.2017 at 03:30 PM (IST) onwards			
Venue of Opening of Technical Bids		Purchase Section, CSIR-IICB			
Tenders to be submitted at		In the tender box kept at Stores & Purchase Section, CSIR-IICB, Jadavpur, Kolkata-32			

241234  
15.09.2017

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## **Specifications for a High Performance Computing (HPC) GPU cluster with Intel architecture**

1. **Master node (Quantity 1)**
  - a) **Form factor of 1U/2U.**
  - b) **Processor. (Quantity 1) E5-2650v4, upgradable to 2 processors (see optional items).**
  - c) **Memory (see optional items). 1x32 GB DDR4 ECC 2400 MHz, upgradable to 384 GB**
  - d) **Storage. HDD bay should support hot-pluggable SAS, enterprise SATA & SSD drives.**
    1. **At least 2 TB (raw) distributed into 2 or more HDD units, 7200 rpm enterprise SATA or SAS.**
    2. **At least 18 TB (raw) distributed into 3 or more HDD units, 7200 rpm enterprise SATA or SAS. (upgradable to another 18 TB)**
  - e) **Graphics. Integrated graphics, 16 Mb or more video memory**
  - f) **RAID levels support for RAID 0, 1, 5.**
  - g) **Connectivity. 2 nos internal, Dual Gigabit network adapter ports.**
  - h) **Ports. x16 and x8 PCIe ports (v3.0), RAID controller slot (dedicated), USB in front and back, serial port, VGA ports.**
  - i) **Power supply. Redundant, 80+ Platinum rated power supply of sufficient capacity to support the server at maximum capacity.**
  - j) **Additional items. Optical RW CD-DVD drive. The system should be compatible with dedicated FDR, EDR Infiniband/Omni-Path connectivity.**
2. **GPU compute node (Quantity 3).**
  - a) **Form factor of 1U/2U.**
  - b) **Processor. (Quantity 2) E5-2650v4 (see optional items)**
  - c) **GPU. (Quantity 1) Any of the Nvidia cards -GTX 1080Ti/Titan X-pascal/K40/K80/P100, upgradable to 2 cards of same type in each compute node. (see optional items)**
  - d) **Memory (see optional items). 2x32 GB DDR4 ECC 2400 MHz, upgradable to 768 GB**
  - e) **Storage. HDD bay should support hot-pluggable SAS, enterprise SATA & SSD drives.**
    - a. **At least 2 TB (raw) distributed into 2 or more HDD units, 7200 rpm enterprise SATA or SAS.**
    - b. **One SSD HDD of 480 GB (raw) or more capacity.**
  - f) **Graphics. Integrated graphics, 16 Mb or more video memory**
  - g) **RAID levels for RAID 0, 1, 5.**
  - h) **Connectivity. 2 nos internal, Dual Gigabit network adapter ports.**
  - i) **Ports. x16 and x8 PCIe ports (v3.0), RAID controller slot (dedicated), USB in front and back, serial port, VGA ports.**
  - j) **Power supply. Redundant, 80+ Platinum rated power supply of sufficient capacity to support the server at maximum capacity.**
  - k) **Additional items. The system should be compatible with dedicated FDR, EDR Infiniband/Omni-Path connectivity**
3. **Cluster connectivity. Web managed Gigabit switch with 24 nos. Base-T and 2 nos. SFP+ ports. Connectivity switch should be from the same OEM as the nodes. Quoted system should have the flexibility to add more compute nodes and upgrade to FDR/EDR Infiniband/Omni-Path connectivity.**
4. **System management. IPMI 2.0 compliant, OEM embedded server management control system and tools to undertake automated system management, including firmware updates. In addition, a KVM switch (at least 8 ports) and all other accessories for management. Monitor, mouse, keyboard need not be quoted.**
5. **Software. Open source Enterprise version Linux, 64-bit, latest version (CentOS/OpenSuse) for all servers. Compatible Cluster & node management suite, including job scheduler (standard, open source) must also be installed and configured by bidder.**
6. **UPS. Online UPS (APC/Eaton/Emerson) of 3 kVA or higher capacity required to sustain the system at full load with the following minimum specifications: - 3 phase in/single phase out, maintenance-free, hot-swappable batteries with at least 15 min backup (upgradeable to 2 hr backup) time under full load.**

7. **Other components. Rack (42U), patch cords, cables, cable ties and all necessary accessories to complete the installation.**
8. **Warranty and service support**
  - a) **5 year comprehensive warranty on the quoted system, including all upgrades during the course of warranty and a call-to-resolution time of 10 days.**
  - b) **OEM must have at least 3 entries in top500 (<https://www.top500.org/>) in last 4 years.**
  - c) **Bidder or their service engineers must have direct presence in Eastern region for at least 3 years. Bidder should submit proof of having provided/maintained at least 3 HPC systems. Name, contact of service personnel and purchase orders for HPC sales should be attached.**
  - d) **Authorization letter. Bidder should provide valid letter of authorization from the OEM for the sale of quoted item, highlighting the adherence of the warranty either directly or through the bidder (or alternate vendors in case of change of distributorship).**
  - e) **Installation should include all hardware, software and accessories, including OS, cluster management tools, CUDA and relevant programs to run the system stably.**
    - i. **Bidder may inspect the installation site and take note of power, air conditioning available to ensure proper functioning of the HPC.**
    - ii. **Shipment must clearly mention serial/part numbers of all the servers, processors, memories/RAM, HDDs and GPU cards.**
9. **Optional items. The prices for the following optional items should be mentioned, if available.**
  - a) **The Compute Node of the aforementioned configuration (as in item 2 above).**
  - b) **Processor E5-2650v4 (as in item 1 & 2 above). In addition, the vendor is recommended to quote alternative processors of equivalent specification/performance to upgrade from E5-2650v4, if the current processor is deemed to be end-of-sale within the next fiscal year.**
  - c) **The GPU card quoted (as in item 2 above)**
  - d) **32 GB memory (as in item 1 & 2 above).**
  - e) **UPS battery and accessories required to extend backup time to 2 hr.**

**Note : -**

1. **More Bidders of the same OEM can submit the quotations subject to the compliance of the eligibility criteria as mentioned at Clause No. 1.2 in Chapter-III of the IICB's tender enquiry. In this case, Manufacturers' Authorization in favour of the bidder/bidders will be accepted as per the format mentioned at Chapter-VIII of the IICB's tender enquiry.**