



# Center for High Energy Physics

## Indian Institute of Science

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12<sup>th</sup> January 2017.

**Subject: Request For Proposal (RFP) for a High Performance Computing cluster.**

Dear Madam/Sir,

I wish to purchase a High Performance Computing (HPC) cluster with a computational capacity of **45 Teraflops or higher** comprising of Pascal 100 (P100) NVIDIA GPUs mounted on Intel Broadwell processors. The detailed specifications will be provided below.

Vendors are requested to kindly provide a proposal for this requirement. The final choice will be awarded on the basis of the lowest price provided all specifications are met. The last date for submission of bids is **27 January 2017**. All quoted prices should be valid for a period of at least 60 days from the last date.

Yours sincerely,

Prasad Satish Hegde  
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**Important Dates:**

Date of release of inquiry: 13 January 2017.

Pre-bid enquiries up to: 20 January 2017.

Last date for submissions: 27 January 2017.



### Detailed Specifications:

Here we specify the requirements pertaining to the different components of the cluster. Before that however, some general remarks are in order:

1. The total speed of 45 TFlops or higher should come entirely from the GPU part of the cluster. The additional TFlops provided by the CPU, although small compared to the GPU part, should not be included in the counting.
2. The nodes should be connected by a Gigabit switch. The cluster should not have an Infiniband switch, although there should be a provision for it in case one is to be added in the future. Thus, the quoted price of the cluster should not include the price of an Infiniband switch.
3. Each of the server nodes should be individually serviceable without shutting down the other server nodes. A further desirable feature is extensibility, namely the ease of adding further nodes in the future.
4. Lastly, in addition to the price, each proposal must also clearly state the following characteristics of the cluster, namely:
  1. The space that will be occupied by the cluster (2U, 4U, etc. and how many racks);
  2. Its power consumption; and
  3. Its cooling requirements.

The specifications for each of the components of the cluster are:

1. **GPU:** The GPUs should be Pascal 100 GPUs of the PCIe type (not the Nvlink type) with 16 GB of memory (not 12 GB).
2. **CPU:** Intel Xeon 8C E5-2640v4 (10 cores, 2.4 GHz, 25M cache, 8GT/s) or higher. A higher configuration may be supplied in case it offers advantages while still remaining competitive in terms of the price.
3. **CPU Memory:** At least 24 GB CPU memory per GPU.
4. **Internal Storage:** 16 TB SATA storage with minimum disk spin speed of 7,200 rpm.
5. **Software:** In addition to the hardware specifications, the vendor must also install the following: Open-source Linux operating system, NVIDIA CUDA toolkit, drivers & SDK and open source MPI, libraries and compilers, apart from any other software that is necessary for the smooth installation, running and maintenance of the cluster.



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6. Redundant Platinum Level (94%) power supplies.
7. Rack-mounted Rail Kit, if necessary.

#### General Specifications:

1. Both the hardware and software components should be from an Original Equipment Manufacturer (OEM) and it is preferable that they should be from the same OEM.
2. All equipment must be compatible with Indian Electrical Standards/Codes.
3. The vendor must carry out the installation, commissioning and cabling of all the hardware as well as software components.
4. The vendor must provide a three-year 24x7 comprehensive on-site warranty of all the installed hardware as well as a comprehensive on-site warranty for maintenance of software and cluster management. The cost of this should be included in quoting the final price, but should be mentioned under a separate heading in the Commercial Bid.
5. The vendor must provide a Manufacturing Authorization Form (certificate from the OEM for quoting the requirement).
6. Additionally, the vendor must provide three references where they have carried out the installations. The Purchase Committee shall independently obtain inputs from the provided referees before arriving at a final decision.
7. The bids should have the option for further negotiations.

#### Eligibility Criteria:

1. The bidding vendor (bidder) should be listed on the website [www.top500.org](http://www.top500.org) for India.
2. The bidder/OEM should have set up at least 3 or more HPCs in the last 3 years with at least one cluster with at least 20 TFlops. Purchase order copies of previous installations are required.
3. OEM should have installation/service center base in Bangalore for such units and a fully equipped service center. Kindly provide details of Karnataka Registration and Office Address.
4. Bidder/OEM has to quote exactly as per mentioned specifications for entire solution, partial offers will not be accepted.



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#### **Tender specifications:**

A proposal should comprise of two parts: A Technical Bid (Part I) and a Commercial Bid (Part II). Both parts should be identical in every respect, except that the Technical Bid (Part I) will not contain information about the price. The Technical Bid should also have an item-wise compliance report of all the specifications. The Commercial Bid must have an itemised pricing information for each component in the Technical Bid. The two parts should be sealed in separate envelopes and marked “Technical Bid” and “Commercial Bid” respectively. Both bids should be finally put into one envelope which should be marked “Bid for High Performance Computational Cluster for Dr. Prasad Satish Hegde (Center for High Energy Physics)”. This final envelope is the one that should be submitted to the institute.

The prices quoted should include both rupee and US dollar quotes and should be inclusive of all taxes/duties. They should also be inclusive of the delivery of the items to the site as well as the installation at the site. Both technical and commercial bid will be negotiable for the lowest costing commercial bid and most desirable technical bid. While evaluating the technical bid, weightage will be given for extensibility, performance and adherence to specifications and references from past customers.

Payment will be made after satisfactory supply and installation. The system supplied may be tested/certified by us through an identified person/committee. Three year on-site warranty should be provided for the hardware. The warranty period will commence from the date of acceptance of the equipment.