INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & 2B, RAJA S C MULLICK ROAD, JADAVPUR, KOLKATA 700032
Invitation for Tender for Supply of
"High Performance Computing Cluster"
(Tender Notice from TRC: IACS/TRC/ID-AP/2016-17/35)

Indian Association for the Cultivation of Science invites Sealed Tenders for purchase of a **An Infiniband based computer cluster with Intel processors along with a GP-GPU system** to be procured from the Institute allocated funds for CSS facility development. The bids are to be submitted in **Two-Bid pattern i.e. Technical Bid and Price Bid** in two separate sealed covers distinctly marked accordingly and both to be put inside another envelope, which should be sealed and super scribed with '**High Performance Computing Cluster Tender for TRC, IACS**' Tender Notice No., Due date and time of opening. Two bids i.e. Technical Bid and Price Bid should be identical in all respects except that the Technical Bid should have blank space at the places where prices have been quoted in the Price Bid. The bidders may submit bids duly signed in their own letterheads. In case the scheduled date of opening of tender is declared as holiday, the tender will be opened on the next working day at 3.00 P.M. The technical bids will be opened first to evaluate the technical specifications of the equipment and the price bids of the technically qualified companies only will be opened thereafter. Complete tender bids should reach the **TRC office, Indian Association for the Cultivation of Science, 2A & 2B, Raja S C Mullick Road, Jadavpur, Kolkata 700032, West Bengal, India,** on or before the scheduled date & time specified below :

Tender Notice No.	
Last Date and Time of Submission of Tender	**31.10.2016** before 17:00 hrs
Pre-bid Meeting (date, time & venue)	**16.09.2016** at 16:00 hrs Raychaudhuri Hall Centenary Building
Date, time and placed of opening of (a) Technical part of Tender (b) Financial part of Tender	(a)**02.11.2016** at 16:00 hrs (b)**07.11.2016** at 16:00 hrs For (a) and (b) venue would be declared later
Contact Details	Prof. Indra Dasgupta: sspid@iacs.res.in Dr. Ankan Paul e-mail: rcap@iacs.res.in

2. PRICE BID: The financial bid indicating item-wise price for the items mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as "PRICE BID" on the outer cover of the envelope as already detailed above.

(a) **The Dollar component of the HPCC solution has to be quoted in dollars on CIF basis. Note the INR component of the HPCC solution would be converted to dollars based on the RBI exchange rate on the day of opening of the price bids and would be added to the dollar component for determining the total price.**

If any vendor quotes the dollar component of the HPCC solution in INR it would be converted to Dollars based on the RBI exchange rate on the day of opening of the price bids.

(b) **The price bid of only technically qualified bidders will be opened and they will be intimated of the date and time of opening to their respective email id-s.** Rest of the bids will stand rejected

(c) **Payment Terms:** payment would be made through LC for the dollar component of a nationalized BANK by IACS.

BID SECURITY:

1. An Account Payee Demand Draft/ Pay Order for Rs.2,00,000/- (Rupees Two Lakhs only) drawn in favor of "Indian Association for the Cultivation of Science" is to be furnished along with Technical Bid as Bid Security money (or EMD). Bidders registered with the Central Purchase Organizations, National Small Industries Corporation etc. may be exempted from paying EMD subject to their submission of a copy of valid registration certificate with their Technical Bids, failing which their bids will be rejected.

2. The Demand Draft/ Pay Order for the Bid-Security money should have at least 60 (sixty) days validity period after the opening of the Bids.

3. In case of non-award of the work, the Bid Security money would be returned to the bidders.

PERFORMANCE SECURITY:

1. An Account Payee Demand Draft/Bank Guarantee of Rs. 6,00,000 (Rupees Six Lakhs Only) drawn in favor of "Indian Association for the Cultivation of Science" is to be furnished by the successful bidder to be awarded the contract, as "Performance Security" money.

2. Performance Security should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.

3. Bid Security would be refunded to the successful bidder on receipt of Performance Security

3. TECHNICAL BID:

OPTION 1:

(i) The High Performance Cluster would comprise of the following components:

Technical Specifications:

(a) **Dollar Component**: (i) One Master Node (ii) Twelve Slave Nodes and (iii) 36 port FDR Infiniband Switch with adequate number of FDR infiniband cables. **INR Component:**(iv) **16 port** KVM switch and requisite cables (v) 42U Rack (800/1000mm) with front perforated door, fan housing unit with adequate no. of fans, PDU with adequate no. of sockets and doors, cable manager and proper castor (vi) 48 port Gigabit Switch Rackmountable

(i) MOTHER NODE Quantity: 1	
Processor	2 X Intel Ten core **2.2GHz** E5-2630V4 processors (DUAL CPU CAPABLE)
Memory	64 GB DDR4-2133 ECC RDIMM **or better**
Storage	2 X 2 TB + 2 X 6TB Enterprise SATA HDD, Hardware RAID Controller supports 0, 1, 5, 10 (Support for 8 HDD Bays)
Chipset	Compatible Industry Standard Intel Chipset
Optical Drive	DVD r/w
Interconnect	Gigabit Ethernet, FDR Infiniband 56Gbps with cables
Chassis	Within 2U Rackmountable (Form factor less than or equal to 2U)
Power Supply	Redundant Industry Standard Platinum Level

(ii) Slave NODE Quantity: 12	
Processor	2 X Intel Eighteen core 2.3GHz E5-2697 V4 processors (DUAL CPU CAPABLE)
Memory	128 GB DDR4-2133 ECC RDIMM **or better**
Storage	2 TB SATA Enterprise class
Chipset	Compatible Industry Standard Intel Chipset
Interconnect	Gigabit Ethernet, FDR Infiniband 56Gbps with cables
Chassis	Within 1U Rackmountable (Form factor less than or equal to 1U)
Power Supply	Redundant Industry Standard Platinum Level
INTERCONNECT	
Infiniband Switch	FDR InfiniBand 1U Switch, 36 QSFP + ports, rack mountable rail kit

(iii) GPU NODE Quantity: 1	
Processor	2 X Intel Eighteen core 2.3GHz E5-2697 V4 processors (DUAL CPU CAPABLE)
Memory	128 GB DDR4-2133 ECC RDIMM **or better**
Storage	2 X 4 TB SATA Enterprise class **or 4 X 2 TB SATA Enterprise class**
Chipset	Compatible Industry Standard Intel Chipset
GPU CARDS	Two NVIDIA® Tesla K80 GPU Computing Accelerator - 24GB GDDR5 - GPU
PCI 3.0 Slots	Three or more
Chassis	Within 2U Rackmountable (Form factor less than or equal to 2U)
Power Supply	Redundant Industry Standard Platinum Level

OPTICAL DRIVE: NOT NEEDED FOR SLAVE NODES AND GPU NODE

PLEASE NOTE: ALL CHANGES/ADDITIONS/CORRECTIONS MADE ARE PRESENTED THROUGH YELLOW HIGH LIGHTING OR COLORED FONTS

OPTION 2:

(i) The High Performance Cluster would comprise of the following components:

Technical Specifications:

(a)**Dollar component:** (i) One Master Node (ii) Twelve Slave Nodes and (iii) 36 port FDR Infiniband Switch with adequate number of FDR infiniband cables. **INR Component:**(iv) **16 port** KVM switch and requisite cables (v) 42U Rack (800/1000mm) with front perforated door, fan housing unit with adequate no. of fans, PDU with adequate no. of sockets and doors, cable manager and proper castor (vi) 48 port Gigabit Switch Rackmountable

(i) MOTHER NODE Quantity: 1	
Processor	2 X Intel Ten core **2.2**GHz E5-2630V4 processors (DUAL CPU CAPABLE)
Memory	64 GB DDR4-2400 ECC RDIMM **or better**
Storage	2 X 2 TB + 2 X 6TB Enterprise SATA HDD, Hardware RAID Controller supports 0, 1, 5, 10 (Support for 8 HDD Bays)
Chipset	Compatible Industry Standard Intel Chipset
Optical Drive	DVD r/w
Interconnect	Gigabit Ethernet, FDR Infiniband 56Gbps with cables
Chassis	Within 2U Rackmountable
Power Supply	Redundant Industry Standard Platinum Level

(ii) Slave NODE Quantity: 12	
Processor	2 X Intel Sixteen core 2.1GHz E5-2683 V4 processors (DUAL CPU CAPABLE)
Memory	128 GB DDR4-2400 ECC RDIMM **or better**
Storage	2 TB SATA Enterprise class
Chipset	Compatible Industry Standard Intel Chipset
Interconnect	Gigabit Ethernet, FDR Infiniband 56Gbps with cables
Chassis	Within 1U Rackmountable (Form factor less than or equal to 1U)
Power Supply	Redundant Industry Standard Platinum Level
INTERCONNECT	
Infiniband Switch	FDR InfiniBand 1U Switch, 36 QSFP + ports, rack mountable rail kit

(iii) GPU NODE Quantity: 1	
Processor	2 X Intel Eighteen core 2.3GHz E5-2697 V4 processors (DUAL CPU CAPABLE)
Memory	128 GB DDR4-2133 ECC RDIMM **or better**
Storage	2 X 4 TB SATA Enterprise class **or 4 X 2 TB SATA Enterprise class**
Chipset	Compatible Industry Standard Intel Chipset
GPU CARDS	Two NVIDIA® Tesla K80 GPU Computing Accelerator - 24GB GDDR5 - GPU
PCI 3.0 Slots	Three or more
Chassis	Within 2U Rackmountable (Form factor less than or equal to 2U)
Power Supply	Redundant Industry Standard Platinum Level

OPTICAL DRIVE: NOT NEEDED FOR SLAVE NODES AND GPU NODE

PLEASE NOTE: ALL CHANGES/ADDITIONS/CORRECTIONS MADE ARE PRESENTED THROUGH YELLOW HIGH LIGHTING OR COLORED FONTS

APPLICABLE TO BOTH OPTIONS 1 AND 2:

(f)**Operating System:** Open-Source stable Linux distribution (latest CENTOS stable version or equivalent)with standard Fortran and C compilers for **(i) and (ii) and (iii). CUDA for (iii)**

(f) **Scheduling Software:** Open-Source stable Linux based job scheduler. The vendor should have the ability to create different user groups with different job privileges and queues for submiting jobs.

(g) **Warranty**: Three (3) years on-site OEM warranty for all components and parts and labor. The warranty period will commence from the date of certification of successful installation of the equipment.

(h) **Installation and Commissioning:** Free of cost at IACS, Kolkata. The vendors are required to give an estimate of the time required for installation fine-tuning of the cluster and hand- holding/training of the principal users in the technical bid. The vendor shall be responsible for setting up of High Performance Linux Cluster using open source Linux distribution (preferably CENTOS) or equivalent (to be provided by vendor) for **(i) and (ii)**

The GPU based server **(iii)** must have latest version of CUDA and can run programs like PETACHEM and LAMMPS.

IMPORTANT NOTE:

PLEASE NOTE EITHER OPTION 1 or OPTION 2 will be procured based on their respective L1 prices and contingent on the requirement.

Vendor and OEM Eligibility:

(I)The bids must be submitted by OEMs or OEM supported single vendors (one vendor one OEM and each OEM can only authorize a single vendor) only with original authorization certificates from the OEMs. OEM supported vendors should have proven experience in setting up of a minimum of three 1 TFLOPS or higher HPCC in the last three years in India. Vendors/OEMS should have proven experience in setting up a HPCC of minimum of two **50 TFLOPS** in the last three years in India and a minimum of 3 installations of at least 1 TFLOPS in Kolkata and adjacent region(e.g. IIT Kharagpur, IISER Mohanpur). A brief proof for such experience (copies of orders/installation certificate) should be included in the technical bid.

Vendor\OEM should be responsible in providing support (software and hardware) for the machine during the warranty period. Both Vendor and OEM would be responsible in ensuring the smooth functioning of the HPC cluster during the warranty period. It is binding on the OEM to choose a vendor who can provide adequate support for proper running of the aforementioned HPC cluster.

OEM must have a minimum of three entries in the current (June 2016) top 500 list of supercomputers (as per top500.org)

(III) Vendor/OEM should have service engineers stationed at Kolkata and should respond to service calls within 24 hours of receiving a notice from IACS. Additionally, the vendor (service provider)/OEM should have an office in Kolkata. The vendor/OEM has to provide contact details of service engineers and its office in Kolkata.

Service call resolution including replacement of parts should occur within 5 business days of receiving the service call.

(IV) It will be highly desirable if the vendor/OEM has proven capability to install some commonly used academic software packages like Gaussian, ADF, Gamess, Polyrate, NWChem, Molpro, DeMon2K, NAMD, VASP, Quantum Expresso. Parallelized installation of academic codes like Gaussian 09 TCP Linda is highly desirable. Vendor/OEM also should have adequate experience in installing and setting up NAMD, GROMACS, LAMPPS and other popular academic codes.

Additional Information to be furnished by the vendor:
(i) **UPS back up**: The vendor should furnish information regarding UPS and associated battery requirements for operating the HPC cluster in a stable fashion.
(ii)**Power, Heating and Cooling**: Power consumption and heat dissipation estimate for the total cluster should be mentioned clearly

Additional Requirements:

(i) **Compliance List:** The vendor must submit a table indicating the compliance of the features of the model of the components being quoted with those given in the indent. In case of non- compliance against a particular item, the vendor should justify that.

(ii) **Training:** Free training on operation, maintenance and troubleshooting of the whole HPCC Solution should be imparted to at least 2 persons for a period of one week at the site of installation.

****Please Note: The decision of the Technical Committee on technical competence and eligibility of any technical bid submitted by any vendor would be final and cannot be contested.**

3. GENERAL INSTRUCTIONS:

(i) **Submitting Tender:** The Tender must contain materials related to these

specifications and should not contain materials that can overtly or covertly try to canvass for the vendor. The vendors are allowed to deviate from the specifications given below only when such deviations are demonstrated to be technically superior.

Additional features in the quoted items which are better than those in the indent – may be highlighted. The technical bid should not have any mention of pricing. The commercial bid should have the pricing for each option separately. Prices should be inclusive of all charges (taxes/duties as applicable, shipping charges, delivery at site, installation etc.) with clearly indicated break- ups. Fax, e-mail Tender will not be accepted. Duplicate Bid document must be submitted in Separate closed cover.

(ii)**Post-sale service:** The vendor must submit the names of the service engineers employed by them who are competent to serve the HPCC installation along with their contact details in India.

(iii)**Tender updates**: Prospective bidders may please refer to our website http://www. iacs.res.in, occasionally for any update on the tender which may appear from time to time either in respect of pre-bid meeting or otherwise.

(iv)**Ineligible Tenders**: Incomplete and conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof. Tender Notice and tender for 'Cluster Computers' should clearly be written on the envelope. The technical committee holds the sole right to declare any submitted tender ineligible based on technical grounds. In such cases decisions taken by tender committee would be final and incontrovertible. Technical committee may ask for additional document

(v) In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.

(vi)**Legal:** The courts of Calcutta would have jurisdiction over any legal issue arising out of this tender notice.