TATA INSTITUTE OF FUNDAMENTAL RESEARCH
Centre for Interdisciplinary Sciences

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Date: 21.12.2017

Notice Inviting Tender cum Tender Document
(Two Part Public Tender) forthe following items:

Supply, Installation, Commissioning of High Performance Computing (HPC) Cluster for TIFR Hyderabad.

As per our technical specifications: **Qty.– 1No.**

Public Tender No.	**TFR/PD/IC17-01/F517/217000.**
Published on	**21.12.2017**
Tender Fees	**For Indian Supplier - Rs.700/-** **For Foreign Supplier-USD 100**
EMD	**For Indian Supplier - Rs. 8,72,000/-** **For Foreign Supplier - USD 13415/-**
Estimated Landed Cost	**Rs. 436 Lakhs**
Pre Bid Meeting	**05.01.2018 AT 10.30 Hrs.**
Last Date for Submission of Bid	**24 .01.2018 upto 13.00 Hrs.**
Date of Opening Bids(Part A)	**24. 01.2018 at 15.00 Hrs.**

Both TechnicalBid (Part A) and Financial Bid (Part B) to be submitted within the due date and time in separate envelopes and marked on top as Part A and Part B. These two sealed envelopes should be further put in one Master Envelope super scribed with the Tender No., Due Date in Bold Letters.

Please see attached sheet for conditions of tender.

ADMINISTRATIVE OFFICER
(PURCHASE SECTION)
TIFR-TCIS, HYDERABAD

SCOPE OF SUPPLY - ANNEXURE A

Supply, Installation and Commissioning of High Performance Computing (HPC) Cluster

Annexure - A

Technical pre-qualification for the bidders

Mandatory requirements for a bidder to qualify as a participant in this tender:

s.no	Technical pre-qualification criteria	Compliance Yes/No	Remarks

1.	The bidder/OEM should have successfully executed at least three High Performance Computing Cluster (HPCC) projects in last five financial years using the architecture and technologies similar to those being proposed in their proposal against this tender with same OEM or different OEMs in Indian Government/ Public/ Private Research organizations /institutions performing scientific computation using High Performance Computing Clusters in India.
	
	 In addition to the above condition, the Bidder and OEM both should satisfy any one of the following condition mentioned below
	
	     1. At least one order of 80% of tender value or
	     2. At least two orders each of 50% of tender value or
	     3. At least three orders each of 40% of tender value
	
	 Purchase order and final commissioning report duly signed by customer should be submitted with the technical bid.
	
	 Note: For the above mentioned criteria, only x86 Xeon based CPU-only HPC cluster orders will be considered. HPCC with Accelerators like NVIDIA Tesla GPUs, Xeon Phis or KNL, etc., based HPCC along CPU nodes will not be considered.		

2.	The OEM and bidder should have the experience in building HPC Clusters in Indian HPC Market since last 3 years with logistics facility for easy access and availability of spares in India to ensure the proper back-end support for smooth execution and post-sale support operations. Documentary proofs should be attached.		
3.	The bidding OEM should have minimum one entry in the latest top 500 supercomputer India list maintained by SERC, IISc (which can be downloaded from		

	http://topsupercomputers-india.iisc.ernet.in/ or https://cc.tifrh.res.in/webdata/documents/events/benchmarks/top500India-June2017.pdf) or should have minimum 10 entries in the latest world top 500 supercomputer list. (available at www.top500.org)		
4.	All warranty and support must be serviced directly by the OEM or should be from an Authorized System Integrator Partner who is Authorized to Support the product/solution proposed. TIFR-H requires that there be a Single Point Of Contact (SPOC) from OEM/Vendor who is responsible for all issues between TIFR-H and the OEM.		
5.	The bidder should have average annual sales turnover of Rs. 10 Crores or more during the last three financial years ending 31st March, 2017. Attach firm's last 3 years audited profit and loss balance sheet duly audited by C.A		
6.	Bidder should be either an Original Equipment Manufacturer (OEM) or should be authorized System Integrator Partner having back to back Support Agreement with the OEM. Manufacturer's Authorization Form (MAF) for participating in this tender is mandatory for bidders and should be attached along with technical bid. The Bidder/OEM participating in the tender process should give an undertaking for the following points on OEM letter head duly signed by competent authority. Hard copy of MAF should confirm the following points and submitted on OEM letter head duly signed by competent authority. a) Details of the bidder authorized to quote for the tender with tender number and details. b) Confirmation on support for the proposed products for seven years from the date of acceptance of installation. c) Direct support from OEM or its authorized entity in the event of partner not responding to service requests. d) Confirming proposed solution is endorsed.		
7.	Hardware and software warranty support requests to be handled and serviced directly by OEM/Bidder. OEM/Bidder should have required critical spares at local service center.		
8.	OEM/Bidder should have a local service center in Hyderabad. Documentary proofs should be enclosed.		
9.	The OEM/Bidder must have a India based support infrastructure by maintaining a local spares depot in the country. This is to ensure immediate delivery of spare parts from OEM to its channel partner/system integrator.		
10.	The OEM/Bidder should have service engineers in the relevant field of quoted items. At their Hyderabad Center, they should have a minimum of one L3 HPC engineer (L1 level is lower) residing in Hyderabad, who should have carried out at minimum three 10 TF HPC installations and software and hardware maintenance of HPC Clusters, who should be able to provide (8.00 AM to 5.00 PM, 6 days a		

	week remote support) Next Business Day onsite hardware and software support for the cluster. Undertaking and Documentary proofs should be enclosed.		
11.	The complete proposed solution must have all encompassing comprehensive onsite warranty of 5 years duration which includes hardware, software, firmware, software updates, etc., If the hardware replacement process takes more than two days, the bidder/OEM should provide a standby hardware till the replacement is made.		
12.	Products offered should have official OEM support for next seven years from the date of acceptance of installation.		
13.	The entire HPCC solution proposed by the bidder/OEM should be offered with lowest power consumption for the given specification in the tender.		
14.	All quotations submitted must follow the prescribed format for technical compliance as in document below. Failure to do will result in the quotation being summarily rejected. Soft copy of the technical bid document in excel format should also be submitted. Soft Copy should be provided in a read only format with CD/DVD.		
15.	One bidder can propose only one technical solution and the price bid for the same should be submitted. Quoting of multiple technical solutions with multiple price bids will result in the quotation being summarily rejected.		

Annexure - B

TECHNICAL QUALIFYING CRITERIA

a) **High Performance Computing Cluster**

The OEM/bidder should carry out below listed benchmark programs on 256 Cores, 512 Cores, 1024 Cores and 2048 Cores peak performance configurations of the proposed solution and also produce the extrapolated outputs of the fully offered solution in peak performance configurations. Benchmark codes can be run on any Xeon based Skylake Gold processor architecture and the extrapolated results can be submitted. It is not necessary to run the benchmark codes on the same gold processor mentioned in the tender, but it should run on a gold processor having a base clock speed of 2.1 GHz. However, the produced results should match with the results of the offered solution as a part of the acceptance test. The maximum allowable deviation from the extrapolated results in the acceptance test should be less than 3%. The results (with TFLOP count where applicable) should be presented in an output file and included in the technical bid.

- Demonstration of High Performance Linpack (HPL) Benchmark performance of minimum 85 %.

- Other applications for Benchmark – LAMMPS, P3DFFT, GROMACS. (https://cc.tifrh.res.in/webdata/documents/events/benchmarks/benchmarking.zip)

Note: All the above benchmark codes including HPL should be run using open source gnu compilers 4.8.5 or above, openmpi 2.0 or above. Other commercial compilers or any code optimizations are not allowed for benchmarking.

Provide read-only output of the above benchmark on DVD/CD along with the bid. Do not provide the print out of the outputs. Proposals of vendors who do not fulfill the above criteria or who fail to submit documentary proof would be rejected.

b) **Storage Solution**

As a part of acceptance test, the bidder should run the following benchmarks on the offered storage solution and results of the same should be submitted.

Open source Bonie++ and IOR/IOZone benchmarks must be used to demonstrate aggregate performance of the storage system. They must be run with many to one distribution of large sequential read and write of 1MB I/O block size.

Scope of Work

Annexure -C

Scope of work includes the following
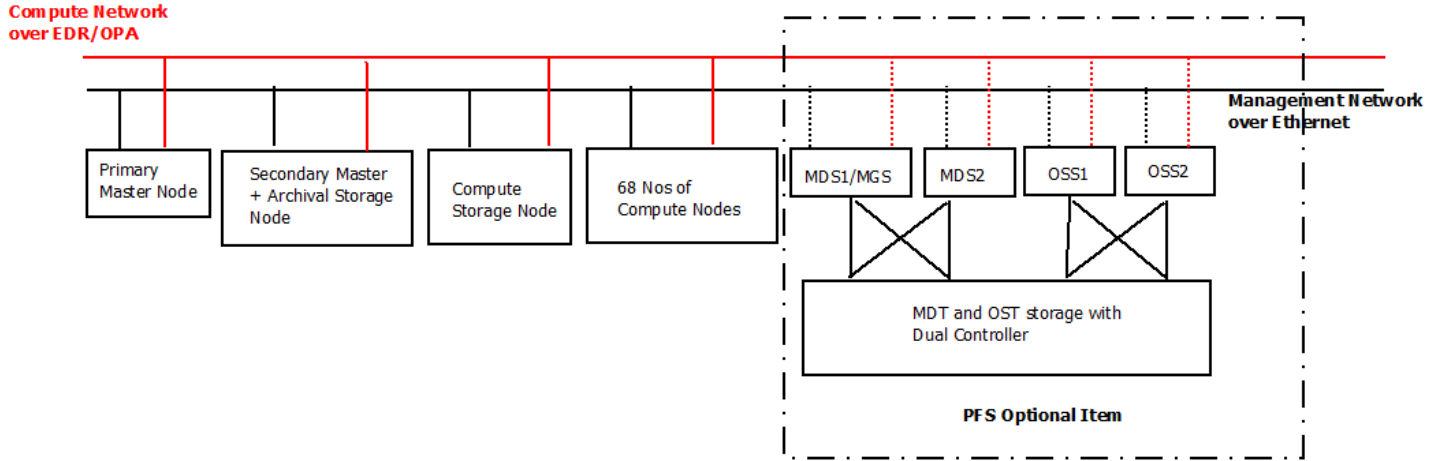
Schematic diagram of proposed HPC system

Technical Specifications

Specifications of the High Performance Computing cluster
Mandatory Clause
1. **All warranty and support must be serviced directly by the OEM or should be from an Authorized System Integrator Partner who is authorized to Support the product quoted. TIFR-H requires that there be a Single Point of Contact (SPOC) from OEM/Bidder who is responsible for all issues between TIFR-H and the OEM.** 2. **All the software deployment will be in vendor's scope of work and vendors to install open source software required by the end user at the time of deployment.** 3. **The Master, compute and storage nodes should be in denser rack form factor designed for cluster solution.** 4. **The entire server, storage and compute nodes must be factory integrated, tested, validated and certified in the bidder/OEM site. No on-site or local assembling of the system at TIFR-H site is allowed. Only rack-mounting, OS and application installation is allowed on-site.**

Mandatory items

Computer Hardware			Make/Model/Remark to be filled by the Vendor		
S.No	**Description**	**Qty**	**Make & Model**	**Compliance Yes/No**	**Remark**

					s
1	**Master Node**	**1**			
	2 x Intel Xeon E5-2620-V4 Processor with 8 Cores, 2.1 GHz or higher				
	Intel C610 or higher Chipset Dual socket Chipset with rack-mountable chassis with sliding rails inclusive of all peripherals.				
	2 x 800 GB Data Center grade MLC SATA SSD hard disks configured with RAID 1 with hot spare for operating system. (Preferred makes : Intel/Equivalent)				
	Minimum 64 GB (8 X 8 GB) ECC DDR4-2133 Mhz or better RAM in balanced configuration for optimizing the memory bandwidth.				
	Minimum 2 GB RAID Controller with support for RAID levels 0, 1, 5,6,10 and built-in option to work in JBOD mode for ZFS support (for future) having Battery Backed Cache.				
	This server should be configured as active-active/active-passive failover controller with archival storage mentioned in item no 2.				
	Minimum 2 X 480 GB Enterprise MLC SATA SSD hard disks or higher for ZFS Caching				
	2 x Intel P3700 800 GB, NVMe PCIe 3.0 x4 MLC AIC or equivalent for ZFS Caching				
	Minimum 2 x 1 Gbps Ethernet ports to connect to TIFR-H LAN. Required accessories also to be quoted for connecting to the LAN.				
	Minimum 2 x 10 Gbps SFP+ (LR Module) ports NIC card to connect to TIFR-H LAN. Required accessories also to be quoted for connecting to the LAN.(for future)				
	Compute connectivity as per Item no – 6				
	IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features				
	Media Over LAN for centralized management of server consoles from the head node should be configured and head node should be connected to the KVM display.				

	80 Plus Platinum or better certified Redundant Power Supply				
2	**Archival Storage Node + Secondary Master Node**	1			
	Archival storage node should also be configured as interactive secondary master node				
	2 x Intel Xeon E5-2620-V4 Processor with 8 Cores, 2.1 GHz or higher				
	Intel C610 or higher Chipset Dual socket Chipset with rack-mountable chassis with sliding rails inclusive of all peripherals.				
	2 x 800 GB Data Center grade MLC SATA SSD hard disks configured with RAID 1 with hot spare for operating system. (Preferred makes : Intel/Equivalent)				
	Minimum 256 GB (16 X 16 GB) ECC DDR4-2133 Mhz or better RAM in balanced configuration for optimizing the memory bandwidth.				
	200 TB usable space with maximum 8 TB 7.2K RPM Helium filled Enterprise SATA/SAS drives with not more than 11 HDDs (9 + 2) in a RAID group configured with RAID Z2 using open ZFS with minimum two global hot spare. In case of multiple storage boxes, the minimum bandwidth between the storage boxes should be 12 Gb/s. (Preferred makes : HGST Ultrastar/WD/Toshiba/Equivalent)				
	Minimum 2 GB RAID Controller with support for RAID levels 0, 1, 5,6,10 and built-in option to work in JBOD mode for ZFS support having Battery Backed Cache.				
	This server should be configured as active-active/active-passive failover controller with head node mentioned in item no 1.				
	Minimum 2 X 480 GB Enterprise MLC SATA SSD hard disks or higher for ZFS Caching (ZIL)				
	2 x Intel P3700 800GB, NVMe PCIe 3.0 x4 MLC AIC or equivalent for ZFS Caching (L2ARC)				
	Minimum 2 x 1 Gbps Ethernet ports.				

	Minimum 2 x 10 Gbps SFP+ (LR Module) ports NIC card to connect to TIFR-H LAN. Required accessories also to be quoted for connecting to the LAN.(for future)				
	Compute connectivity as per Item no – 6				
	IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using thes`1e features				
	80 Plus Platinum or better certified Redundant Power Supply				
3	**Compute Nodes**	**68**			
	2 x Intel Xeon Gold 6130 Processor with 16 Cores, 2.1 GHz				
	Intel C620 series dual socket Chipset with rack-mountable chassis with sliding rails inclusive of all peripherals.				
	Minimum 1 x 120 GB MLC Enterprise SATA SSD hard disks for the Operating System. (Make: Intel/Equivalent)				
	Minimum 96 GB (12 x 8 GB) ECC DDR4-2666 MHz or better RAM in balanced configuration for optimizing the memory bandwidth.				
	Form Factor – 1U half width server.				
	Compute connectivity as per Item no – 6				
	Minimum 2 x 1 Gbps Ethernet ports				
	IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features				
	80 Plus Platinum or better certified Redundant Power Supply				
4	**Compute Storage Node (Optional, Quote Compulsory)**	**1**			
	2 x Intel Xeon E5-2620 V4 Processor with 8 Cores, 2.1 GHz or higher				
	Intel C610 or higher Chipset Dual socket Chipset with rack-mountable chassis with sliding rails inclusive of all peripherals.				
	2 x 120 GB Data Center grade MLC SATA SSD				

	hard disks configured with RAID 1 for operating system. (Preferred makes : Intel/Equivalent)				
	Minimum 256 GB (16 X 16 GB) ECC DDR4-2133 MHz or better RAM in balanced configuration for optimizing the memory bandwidth.				
	200 TB usable space with maximum 4 TB 7.2K RPM NL-SAS/SAS drives with not more than 10 HDDs in a RAID group configured with RAID Z2 (9+2) using open ZFS with minimum 6 global hot spares. In case of multiple storage boxes, the minimum bandwidth between the storage boxes should be 12 Gb/s. (Preferred makes : HGST Ultrastar/WD/Toshiba/Equivalent)				
	Minimum 2 GB RAID Controller with support for RAID levels 0, 1, 5,6,10 and built-in option to work in JBOD mode for open ZFS support having Battery Backed Cache.				
	Minimum 2 X 480 GB Enterprise MLC SATA SSD hard disks or higher for ZFS Caching (ZIL)				
	2 x Intel P3700 800GB, NVMe PCIe 3.0 x4 MLC AIC or equivalent for ZFS Caching (L2ARC)				
	Minimum 2 x 1 Gbps Ethernet ports.				
	Compute connectivity as per Item no – 6				
	IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features				
	80 Plus Platinum or better certified Redundant Power Supply				
5	**Parallel File System (Optional, Quote Compulsory)**				
5.1	**Parallel File System general specifications**	**1**			
	200 TB usable space with minimum 4 TB 7.2K RPM NL-SAS or SAS drives with not more than 10 HDDs in a RAID group configured with RAID 6 (9D+2P). (Preferred makes : HGST Ultrastar/WD/Toshiba/Equivalent)				
	Global Hot Spare Disks: Disks amounting to 5% of total capacity to be provided as Global Hot spare (i.e., Global Hot Spare for every 2 LUN in RAID 6)				
	Parallel File system (PFS) should be Open Source				

	Lustre PFS. The solution should be highly available and with no single point of failure including I/O servers, Metadata servers, Storage array, HBA Cards and power supply.				
	Storage Throughput – Minimum 2 GB/s (Giga Bytes per Second) write speed from compute nodes.				
	Storage nodes & Management nodes should be connected with KVM switch and display.				
	Open-source IOR/IO Zone benchmarks running on compute nodes with 1MB block size and file size double than total storage cache and I/O node memory. As a part of acceptance test, Benchmarks should be run and submitted with I/O measured from client (compute node) using IOR benchmark for 2 GB/s write throughput.				
	2 Nos of OSS Servers should be connected in HA for redundancy				
	2 Nos of MDS Servers should be connected in HA for redundancy				
	Wire speed IB/OPA connectivity between Storage servers to Storage enclosures with Redundant Connects & Links.				
	MDT should be mounted only with MDS server.				
	OST should be mounted only with OSS servers.				
	For MDT Failover, MDS Nodes should be configured with active/passive pair.				
	For OST Failover, OSS Nodes should be configured with active/active pair.				
	High Availability should be automated.				
	MDT storage should be minimum 3% of the capacity of OSTs as usable space using minimum 600 GB 10 K Enterprise SAS drives configured in RAID 10 (1+0) with minimum two global hotspare.				
	MDT and OST must be on the same storage. Disk storage dual controller with minimum 8 GB Cache per Controller and it should have minimum 4 nos of 8 Gbps FC Adapter per controller to achieve HA described in the above diagram. Required accessories also to be included for achieving HA.				
	Failover and MMP (Multiple Mount Protection) should be configured.				
	File system should not go down, even if one of the MDS or OSS nodes fails.				
	Mounting and unmounting of the file system should happen without error.				

	Compute connectivity as per Item no – 6					
5.2	**Object Storage Servers (OSS) – 2 Nos & Meta Data Servers (MDS) – 2 Nos**	4				
	2 x Intel Xeon E5-2620-V4 Processor with 8 Cores, 2.1 GHz or higher					
	Intel C610 or higher Chipset Dual socket Chipset with rack-mountable chassis with sliding rails inclusive of all peripherals.					
	2 x 120 GB 2.5" Enterprise MLC SATA SSD hard disks configured with RAID 1 for operating system. (Preferred makes : HGST Ultrastar/WD/Toshiba/Equivalent)					
	Minimum 128 GB (8 X 16 GB) ECC DDR4-2133 Mhz or better RAM in balanced configuration for optimizing the memory bandwidth.					
	Minimum 2 x 1 Gbps Ethernet ports					
	1 x Dual port 8Gbps FC Adapter for Storage Connectivity. Required accessories also to be included for achieving HA.					
	Compute connectivity as per Item no – 6					
	IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features					
	80 Plus Platinum or better certified Redundant Power Supply					
	Note: Based on requirement, either Sl.no - 4 compute storage node or Sl. No – 5 Parallel File System will be chosen for the HPCC solution. TIFR-H Technical committee reserves the right to choose any of the items.					
6	**Network/Interconnect & Connectivity**					
	Rack mountable 48 Port L2 Managed Gigabit switches for IPMI management with required peripheral for rack mounting.	As Re qui red				
	Compute connectivity - The entire cluster compute connectivity should be completely non-blocking interconnection of 100 G EDR InfiniBand/OPA - Omni Path Architecture. All required accessories including IB/OPA cables to	As Re qui red				

	achieve the non-blocking interconnection should be considered.					
	Required power cables for the equipment / devices of type - IEC C13/C14 and IEC C19/C20 from OEM should be considered.					
	All Network/Interconnect cabling must be structured and adhere to ANSI/TIA – 568 Standard. Note: Cables should be lengthy to connect across racks, in case the cluster load is distributed across multiple racks.					
7	**KVM Display (Optional, Quote Compulsory)**	1				
	1U Rack mountable 17" OSD with attached Keyboard & touchpad with USB with accessories to connect with the Primary Master node.					
8	**Fully Automated System Provisioning**	1				
	Operating System – Latest stable version of CentOS or OpenSUSE					
	Clustering tool – xCAT (opensource)/openHPC					
	Scheduler – SLURM Scheduler configuration inputs has to be taken from the TIFR-H HPC Committee					
	Cluster management tools – Ganglia, PDSH, PDCP, Nagios, automated emails, monthly report generation, etc., TIFR-H HPC System Administrators will be providing the other required management tools and functionalities during installation.					
9	**Software**	1				
	Intel Parallel Studio XE latest composer edition or higher along Intel MPI libraries five seaters license with one year support (Optional, Quote compulsory)	1				
	Open Source Application Software list for installation : FFTW, P3DFFT, GERRIS,, LAMMPS, QUANTUM ESPRESSO, NAMD, GROMACS etc., **Scientific programs:** Lapack, scalapack, Python, Numpy, SciPy, Setuptools, IPython, pythondev, pythonnumpy, pythonmatplotlib, pythontk, pythonlxml, PyReadline, MDAnalysis. Editors: Vim, Gvim, GNU plot, NTPD, GRACE, BC, VMD, Perl, etc., **Compilers and Libraries:** OpenMP, MPI, C/C++ and FORTRAN compilers, gsl libraries should be installed.					
10	**Warranty, Support, Terms & Conditions**	1				

10.1	**Comprehensive onsite hardware and software warranty for 5 Years**	1				
	If TIFR-H request for OS/software upgrade due to their functionality requirement, the bidder/OEM should reinstall/Upgrade the OS and clustering tools and benchmark the cluster and re-commission the HPCC at any point of time during the warranty period at no cost to purchaser.					
	Training for general system administration with documentation including tasks such as user/node management, installation/upgrade, queuing system management and file system management.					
	The OEM/Vendor should have L2/L3 level service engineers in the relevant field of quoted item. At the Hyderabad Center, they should have a minimum of 1 HPC engineer residing in Hyderabad, who should have carried out at minimum three 10 TF or above HPC installations and should have experience and complete knowledge of HPC hardware and software used by the users mentioned in the document and he should be able to provide support to the users **(8.00 AM to 5.00 PM, 6 Days a week) remotely and Next Business Day (NBD) onsite hardw**are support. Details of the HPC engineers assigned to the projects and their Resume should be enclosed (Mandatory, not optional)					
	One L3 level trained personnel should be available to help either remotely (8.00 AM to 5.00 PM, 6 Days a week) or NBD onsite for technical support for administration/maintenance (both software and hardware levels) of HPC.					
	OEM/Vendor should not change the support engineers assigned to this project without TIFR-H IT in-charge knowledge.					
	Vendor/OEM engineer should visit TIFR-H every 30 days and carry out proper hardware & software health check of HPC cluster and submit report of the same to the IT in-charge.					
	Vendor will be responsible to protect user data during any maintenance in the warranty period.					
	The OEM/Bidder should have automated ticketing system with a dedicated helpdesk email account which is regularly monitored and it should be available to TIFR-H users.					
	An escalation matrix for issues not resolved by the support personnel, with an expected time line, should be clearly mentioned.					

	The person should have enough experience to handle cluster hardware and software troubleshooting to resolve the problems faced by the users. This should include fine tuning of the scheduler's various capabilities.				
	The person should be able to produce required status report of the cluster when asked using the software installed in the cluster to manage it.				
	Faulty parts should be replaced by NBD (Next Business Day).				
10.2	**Documentation**				
	- User Creation/Deletion/Modification. - Bringing up and shutting down the cluster. - Disk status monitoring of Master/IO nodes and storage enclosure. - Basic troubleshooting for storage and job scheduler. - Step by step installation guide for node configuration from scratch. - When handing over the cluster the vendor should provide the full design of the cluster installation including the electric connections, network connections, user manual clearly explaining how to use the cluster.				
10.3	**Terms and conditions:**				
	Any item not specifically mentioned in the specification but is required for successful implementation of the HPC solution (in the opinion of the vendor) must be brought to our notice and quoted accordingly.				
	The entire solution should fit in a 19" standard IT Rack.				
	At the time of installation, if it is found that some additional hardware or software items are required to meet the operational requirement of the configuration, but not included in the vendor's original list of deliverables, the vendor shall supply such items to ensure the completeness of the configuration at no extra cost.				
	TIFR-H reserves the right to increase or decrease the quantity of the items.				
	Delivery period will be 8 weeks from the date of purchase order. Once delivered to onsite, the installation, commissioning and acceptance testing period will be within 4 weeks from the date of delivery of equipment.				
	The vendor immediately after the award of the work shall prepare a detailed plan of installation as proposed to be followed by placement of the				

	equipment, etc.				
	All vendors participating in this tender must visit the TIFR-H site for a complete site survey and also meet with the TIFR-H IT team in the pre-bid meeting for detailed discussions and clarifications, if any.				
	The installation should be done by certified and trained engineers for HPCC stack followed by comprehensive user training.				
	Installation and integration of all supplied hardware and software shall be done by the vendor. The vendor shall install and configure all required hardware and software suites, including but not limited to racking and stacking, Cluster networking, Configuring all nodes, Execution and submission of jobs, Installation of compilers (with flags for optimization) and applications, Configuration of environment variables and license utility configuration.				
	Entire installation should be done at the proposed site only. Remote control of network will not be given till the commissioning of the HPCC.				
	Give all model numbers of master nodes, compute nodes, hybrid nodes, storage nodes, Infiniband/OPA chassis switch model, Accelerator card details (if any), maximum number of port in IB/OPA switch and how many ports populated. OEM part code of all the equipment / devices proposed should be provided with the technical bid.				
	Provide case logging procedure for both hardware and software failure.				
	OEM/Bidder is responsible for all performance benchmarks and the quote should contain an undertaking certifying the same from the OEM/Bidder.				
	As a part of acceptance test, TIFR-H team will check all the software mentioned above, for at least 3 days. TIFR-H teams will cross-check benchmarking and all other tests based on our input files in the fully offered solution. Apart from this, the bidder has to run and submit Linpack, Lapack, Scalapack benchmark results to the TIFR-H team.				
	All LAN cabling should be done on-site as per the length required using CAT6. Do not use factory crimped standard length CAT6 cables. All cabling should be done to provide efficient air circulation and should not block any air circulation behind the servers.				

	Please specify the heat dissipation (in BTU) and max power consumption of each component when configured with the above configuration. The bidder has to visit the installation site and provide the plan, cluster rack arrangement and cooling requirements for hosting the HPCC in the given place.				
	All the required CAT6 Patch cables should be branded (ISO/IEC 11801) and it should be molded cables. It should withstand the heat produced at the back of servers.				
	Supplier should have direct system integration (SI) with the OEM whose product the vendor is quoting for. The bidder should have a back-to-back agreement with the OEM to supply and support the OEM's product and solution in India.				
	Itemized price list of each hardware item, software bundle and service and warranty to be given separately and clearly.				
	TIFR-H requires that there be a Single Point of Contact (SPoC) directly from OEM who is responsible for all issues between TIFR-H and the OEM/partner who executes this project.				
	SLA of 98% of uptime within 24 hours reporting onsite, failing which penalty will be applicable based on deviation.				
	The bidder has to ensure that the solution proposed delivers an uptime of 98% of the entire system on a yearly basis and minimum of 92% on a monthly basis. Every percentage of uptime below 98% on a yearly basis will incur 0.1% of the total cost of this tender. In the event of failure of any of the subsystems or components of the proposed solution, the bidder has to ensure that the defects are rectified within two full working days. All these conditions need to be satisfied. Any delay in servicing node(s) beyond 3 days will incur a penalty of 0.2% of the total cost of this tender per day of delay. Any delay in storage or any of its subsystems not working beyond 24 hours will incur a penalty of 0.2% of the total cost of this tender for every completed 24 hours.				
	Bidder should provide complete documentation about the Rack layout, power, cooling and electrical infrastructure required at TIFR-H along with the technical bid.				
	Entire solution to be implemented in 12 weeks' time line. Delay in delivery will have penalty. TIFR-H reserves the right to cancel the order if it is not deployed even after that.				

	Delay due to TIFR-H will not be considered for computing penalty.				

Schedule of experience of last five years

Annexure - D

Please furnish list of firms/offices where you have undertaken similar jobs (please use additional sheets, if necessary)

S. No	Name of company with full address	Name of the project	Purchase order No & Date	Brief description	Value (INR)
Signature					
Name & Contact details					
Designation					
Name of the company					
Date					
Seal of the company					

Audited Annual Turnover

(Certified By CA)

Annexure - E

S.No	Financial/Accounting year	Profit (Rs.)	Loss (Rs.)	Annual Turnover (INR)
1	2016-2017			
2	2015-2016			
3	2014-2015			
..	..	..	..	..

AUTHORIZED SIGNATORY WITH SEAL

N.B

The right to suspend the NIQ/IIT process or part of the process, accept or reject any or all NIQ/IITs at any stage of the process and/or to modify the process or any part thereof anytime without assigning any reasons thereto is reserved by TIFR-H-TIFR without any obligation or liability whatsoever.

Schedule of deviations from specifications/conditions

Annexure - F

All deviations from the specifications/conditions shall be filled in by the bidder in this schedule.

The bidder hereby certifies that the above mentioned are the only deviations from the technical specifications/ Commercial terms and conditions of this tender. (State NIL if no deviation is envisaged)

Signature	
Name	
Designation	
Name of the company	
Date	
Seal of the company	

Annexure - G

Supply, installation and commissioning of High performance computing cluster

TIFR-H Enquiry No & Date: _____
Due date: _____
Bidder's Quotation Ref No. & Date:_____

Financial Bid

All the Bidders should quote their offer in the following format for uniformity.

S.No	Item Description	Qty	Make/ Brand/ Type	Rate per unit (Currency)	Total Amount (Currency)
A. 1	Primary Master Node	1			
2	Archival Storage Node + Secondary Master Node	1			
3	Compute Nodes	68			
4	Compute Storage Node (Optional, Quote Compulsory)	1			
5	Parallel File System (5.1 and 5.2) (Optional, Quote Compulsory)				
5.1	MDT and OST Storage	1			
5.2	MDS and OSS Servers	4			
6	Network/Interconnect & Connectivity	As Required			
7	KVM Display (Optional, Quote Compulsory)	1			
8	Fully Automated System Provisioning	1			
9	Intel Parallel Studio XE latest composer edition or higher along Intel MPI libraries five seater license with one year support (Optional, Quote compulsory)	1			
10	Miscellaneous				
B	Ex-Works cost (Duly packed Airworthy/Seaworthy of international standard)				

C	FOB /FCA Cost (Name of Airport_____)			
D	CIP/CIF Cost (Upto Hyderabad Airport)(allinclusive i.e. Cost of Goods, Packing, Insurance, Inland transportation, freight etc.)			

Note:
1. All the column should be appropriately filled and not left blank.
2. Do not include any other charges, taxes, duties etc. in the Basic Cost of the item.
3. Any accessories, optional items should be shown separately using above format.
4. Use separate sheet for detail description, specification of the item, but prices should be quoted in same format.
5. Prices quoted in Indian Currency should be on F.O.R. basis and mentioned separately using different table format showing all the applicable taxes/Duties like GST, service tax, Freight & Transportation charges and installation charges etc.
6. TIFR-TCIS being educational & research institute, discounted price shall be offered.

Signature of the Bidder

Name, Address contact no _____

& email id of the bidder/ _____

Company with company's Stamp or Seal_____

Date: _____

Place: _____

TATA INSTITUTE OF FUNDAMENTAL RESEARCH
Centre for Interdisciplinary Sciences
Plot No.36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District.
Hyderabad - 500 107, Telangana, India.
(PURCHASE SECTION)

Terms and Conditions

1. **PART "A" (Technical Bid) consisting of Technical Bid with Commercial Terms** and **PART "B" (Financial Bid) consisting of only Price** shall be submitted in **separate** sealed envelopes duly superscribed with the tender enquiry number, and the due date in bold letters, addressed to the Administrative Officer, Tata Institute of Fundamental Research, Plot No.36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District. Hyderabad-500 107, Telangana, India. The envelopes should be clearly marked on top as either PART "A" or PART "B".

   The two sealed covers should be further put in a master cover superscribed with the Tender Enquiry No., Due Date in bold letters, addressed to the Purchase Officer, Tata Institute of Fundamental Research, , Plot No.36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District. Hyderabad-500 107, Telangana, India. The sealed master envelop has to be delivered by hand/courier at the security Gate Office of TIFR-TCIS on or before 13.00 hrs. on the due date specified. The technical bid will be opened in the presence of attending tenderers at 15.00 hrs. on the due date at Purchase Section, TIFR-TCIS, Hyderabad. Tenders submitted after 13.00 hrs. on due date will not be considered.

2. **In case the PART "A" and Part "B" bids are not sealed in separate envelopes the tender will be rejected.**

3. The technical bid should not contain any indication of the price. The bidder should take special care not to mention anything related to pricing and costing aspect of whatsoever nature. The technical bid should include/contain only technical specifications, technical literature, drawing, quantity, manufacturing and delivery schedule, mode and terms of payment, mode of dispatch, the quantum and percentage of statutory levies payable by the purchaser as extra and all related commercial terms and conditions for the supply and for the services like erection and commissioning to be rendered by the tenderer. The details of the validity of the tender should also be indicated along with the commercial details.

4. After scrutiny of Technical Bids, Financial bids of only those bidders who are shortlisted on technical basis will be opened at on later date. The opening date, time and venue will be intimated to the technically successful bidder.

5. **Tender Document Fee:**
   a) **For Indian Supplier**: Tender fee for **Rs. 700/-** (Non-refundable) in the form of D.D. in favour of "TIFR Centre for Interdisciplinary Sciences", payable at Hyderabad to be enclosed with the Technical Bid (Part - A).

   b) **For Foreign Supplier**: Tender fee of **USD 100** (Non-refundable) in the form of advance cheque in favour of "TIFR Centre for Interdisciplinary Sciences", payable at Hyderabad to be enclosed with the Technical Bid (Part A).

6. **Earnest Money Deposit (EMD):**
   a) **For Indian Supplier**: Earnest Money Deposit (EMD) for **Rs. 8,72,000 /-**in the form of D.D. in favour of "TIFR Centre for Interdisciplinary Sciences", payable at Hyderabad to be enclosed along with the technical Bid (Part - A).

   b) **For Foreign Supplier: Earnest Money (EMD) for USD 13,415/-**   in the form of advance cheque in favour of "TIFR Centre for Interdisciplinary Sciences", payable at Hyderabad to be enclosed with the Technical Bid (Part - A).

   EMD shall be interest free and it will be refunded to the unsuccessful bidder without any interest. EMD will be forfeited if the bidder withdraws or amend impairs or derogates from the tender in any respect.

7. **Bidders who have not accepted the job/order awarded to them or withdrawn from the tender process OR whose EMD/Security deposit has been forfeited in the past their bids will not be considered and treated as ineligible / disqualified.**

8. After downloading the documents please inform your company details such as name, address, telephone nos., contact person and email address etc. by email to us. (purchase@tifrh.res.in) to enable us to inform prospective bidder for any corrigendum/changes if any; in the Tender document before due date.

9. Quotations must be valid for a period of 180 days from the due date.

10. Tenders containing correction, overwriting will not be considered. Late or delayed/Unsolicited quotations/offers shall not be considered at all. These will be returned to the firms as it is. Post tender revisions/corrections shall also not be considered.

11. Tenderer should sign on all the pages of the technical bid and the price bid.

12. The price quoted for Import item must be on following basis:

    a) Ex-Work/factory duly packed airworthy/seaworthy and of international standard
    b) FOB/FCA
    c) CIF Hyderabad, Airport Port (all-inclusive i.e. Cost of Goods, Packing, Insurance, Inland transportation, freight etc.)

For local item /supply, offer should be on FOR basis (i.e. total landed cost for delivery at TIFR-TCIS, Hyderabad).

The dimension of the item (viz. H, W, L, weight etc.) shall be specifically stated and also mention whether the mode of shipping the item is Airworthiness / Seaworthiness or both. Accordingly the mode of shipment will be decided by TIFR-TCIS.

Price must be quoted in the Price Bid Format attached herewith as "Part –B" (Financial Bid).

13. If equipment offered is to be imported, arrangements for import will be made by us.

14. Tenders who do not comply with any of the condition are liable to be rejected.

15. The Institute shall be under no obligation to accept the lowest or any other tender received in response to this tender notice and shall be entitled to reject any tender without assigning any reason whatsoever.

16. TIFR reserves the right to place the order for part/reduced quantity than what is specified in the tender.

17. Performance Security : The Successful bidders should deposit **@ 10%** of Purchase Order value as Performance Security against issue of order/contract at the earliest. The performance security shall be in the form of Demand Draft in favour of "TIFR Centre for Interdisciplinary Sciences, Hyderabad" payable at Hyderabad (or) Bank Guarantee from State Bank of India & Associates (or) any one of the Nationalized Banks.

The Performance Security will be returned back to the successful supplier on receipt of the Performance Bank Guarantee (or) The 10% Performance Security Deposit may be extended as Performance Bank Guarantee valid for 60 days beyond the date of completion of all contractual obligations of the supplier including warranty period. Vendor should clearly mention their acceptance to this effect in their quote.

Performance Bank Guarantee: Performance Bank Guarantee for 10% of the value of supply should be provided and it should be valid for 60 days beyond the date of completion of all contractual obligations of the supplier including warranty period. Performance Bank Guarantee should be from Nationalised Bank. In case Performance Bank Guarantee is not provided, 90% payment only would be released and balance after 60 days beyond the date of completion of all contractual obligations of the supplier including warranty period. Vendor should clearly mention their acceptance to this effect in their quote.

18. **PAYMENT TERMS**: **80%** payment shall be made through irrevocable L/C on presentation of complete and clear shipping documents, Material receipt and balance **20%** of the amount shall be released after the receipt, installation, commissioning and acceptance of the equipment and on submission of "**Performance Bank Guarantee (PBG)**" or "Standby Letter of Credit" for an amount equivalent to 10% of the Purchase Order Value. The PBG or "Standby Letter of Credit" shall be valid for a period of **60 days** beyond the date of warranty period. The PBG should be from State Bank of India & Associates (or) any one of the Nationalized Banks.

19. For Import cases: **No Agency commission will be paid as per Govt. of India rules**.

20. All bank charges outside India to supplier's account only.

21. TIFR is exempted from paying of Custom Duty under the notification No.51/96 dated 23.07.1996, Excise Duty under the notification No.10/97 dated 01.03.1997, for all procurements/supply meant exclusively for Educational, scientific and research purpose. Whenever the exemption certificate not honored by the authorities, the applicable duty will have to be paid. Hence Excise & Custom duties, if any, should be shown separately.

22. **TAXES** : TIFR does not have any exemption/concession on payment of Sales Tax and we are not authorized to issue any Sales Tax Form 'C' & 'D'.

Deduction of Indian Income Tax Deduction at Source: The Deduction of Indian Income Tax Deduction at source (TDS) will be deducted as per IT Act. The taxes at the time of actual utilization of service etc. will be deducted if applicable any.

GST rule will be applicable with effect from 01.07.2017. The applicable TDS /other charges if any as per GST rule will be deducted as per new GST regime.

TIFR-Hyderabad GST NO: 36AAATT3951F2ZG.

23. Bidders , please provide the PAN No., Bank Details, email ID, Contact person details, GST No etc.

24. **The Supplier shall arrange to ship the ordered materials within the mutually agreed delivery period mentioned in the order unless extended with/without penalty. Please mention the Delivery Period Clearly in the Bid, however effort to be taken to deliver the materials at the earliest.**

   a) In case of delay in supply on part of the supplier, a penalty @0.5% per week of order value will be charged for delayed period subject to a maximum of 10% order value.

   b) If the delay in the shipment of the ordered materials attributable to the supplier exceeds agreed time period from the date of original agreed upon date of shipment and extended with/without penalty, the TIFR-TCIS, Hyderabad shall have the right to cancel the contract / purchase order and recover the liquidated damages from

other dues of the party or by legal means. It will also affect the other/future business dealings with such suppliers.

c) The same rate of penalty shall be applicable for late installation of the equipment/instrument also.

25. **COMMENCEMENT OF WARRANTY PERIOD**: The warranty period of an item shall commence from the date of receipt of the item in good working condition and satisfactory installation/commissioning/demonstration at the project site.

26. **ANNUAL MAINTENANCE CHARGES**: The bidder must mention in the quotation, the rate/amount of annual maintenance charges, if we opt for maintenance contract after expiry of the warranty period.

27. Specifications are basic essence of the product. It must be ensured that the offers must be strictly as per our specifications. At the same time it must be kept in mind that merely copying our specifications in the quotation shall not make the parties eligible for consideration of the quotation. A quotation has to be supported with the printed technical leaflet/literature of the quoted model of the item by the quoting party/manufacturer.

28. **OBSERVANCE OF LOCAL LAWS**: Wherever applicable (particularly for Local vendors), the vendor / contractor shall comply with all law, statutory rules & regulations etc. The vendor/ contractor shall obtain all necessary permits / approval from the local Governing Body, Police, and other concerned Authorities as may be required under law. The vendor /contractor shall pay all types of taxes, fees, license charges, deposits, duties, tolls, royalty or other charges that may be leviable account of any of the operations connected with the execution of this work/ contract.

29. Incase of any interpretational issues arises in this tender, the interpretation/decision of TIFR TCIS shall be final and binding on the bidder.

30. It is the responsibility of the vendor to make sure that the system being proposed can be exported to India with TIFR TCIS as the end user. All clarificatory documentation must be submitted with the Bid.

31. TIFR TCIS reserves the right to ask for or to provide any clarification, changes after the release of this tender. Any changes or clarifications provided by TIFR-TCIS, Hyderabad may be checked at TIFR-TCIS website: http://www.tifrh.res.in/index.php/commercial-tenders

ADMINISTRATIVE OFFICER
(PURCHASE SECTION)
TIFR-TCIS, HYDERABAD