TENDER DOCUMENT

TENDER FOR THE PURCHASE OF

HPC System

UNDER

TWO BID SYSTEM

NO. 1062-17/CS-10025/Instt/PS

CHECK LIST

DULY FILLED CHECK LIST TO BE ATTACHED WITH THE TECHNICAL BID

Sl. No.	Particulars	Check Mark
1	Whether EMD / Tender Fees attached?	Yes/ No
2	Whether technical specifications of the quoted equipment attached?	Yes/ No
3	Whether catalog of the equipment attached?	Yes/ No
4	In case of authorized agent/distributor whether certificate/ authorization letter for the same issued by the manufacturer attached?	Yes/ No
5	Whether tender document along with all Annexures (B to G) duly signed & stamped by the authorized signatory attached?	Yes/ No
6	Whether affidavit duly attested by the Oath Commissioner/Executive Magistrate regarding non-black listing of supplier attached?	Yes/ No
7	Whether list of Institutes/Organizations where the quoted model of equipment supplied by the tenderer in India is attached?	Yes/ No
8	Whether split rates of each sub units are quoted?	Yes/ No
9	In case of foreign suppliers quoting directly, whether, the name of Indian agent mentioned?	Yes/ No
10	Whether compliance sheet duly filled in, signed & stamped attached?	Yes/ No
11	Whether warranty certificate duly filled in, signed & stampeled attached?	Yes/ No
12	Whether AMC certificate duly filled in, signed & stampeled attached?	Yes/ No

List of Annexures

भारतीय प्रौद्योगिकी संस्थान रोपड़
INDIAN INSTITUTE OF TECHNOLOGY ROPAR
नंगल रोड, रूपनगर, पंजाब-140001/Nangal Road, Rupnagar, Punjab-140001
Ph. 01881-242193, e-mail: purchase@iitrpr.ac.in

NO. 1062-17/CS-10025/Instt/PS 26/03/2018

Notice Inviting Quotation

IIT Ropar intends to purchase the following equipments. You are, therefore, requested to send your sealed offer in Two Bid System as per the instructions given below:

Sl. No.	Description	Quantity
1	**HPC System (Detailed specifications of above items as per Annexure-A (1))**	As per Annexure-A (1)
2	**Application Benchmarks (Detailed specifications of above items as per Annexure-A (2))**	As per Annexure-A - (2)

1. Schedule of EMD :

1	**Last Date and Time of receipt of tender :**	**17.04.2018 up to 03:00 PM.**
2	**Opening of Technical Bids on :**	**17.04.2018 at 03:30 PM.**
3	**Tender Fee**	**₹2,000.00**
4	**Earnest Money Deposit (EMD)**	**₹4,000,000.00**

2. Tender Fees and EMD:

Tender Fees & EMD to be submitted in shape of DD/BG/TDR favouring 'The Registrar, IIT Ropar' payable at Ropar alongwith the Technical Bid. Offers without EMD shall not be considered.

3. Two Bid System :

(a) Technical bid consisting of all technical details alongwith commercial terms and conditions and EMD; and

(b) Financial bid indicating item-wise price for the items mentioned in the technical bid.

Technical bid and financial bid should be sealed in separate covers duly superscribed and both these sealed covers are to be put in a bigger cover which should also be sealed and duly superscribed as "Technical Bid for the supply of "HPC System " and "Financial Bid for the supply of "HPC System " Due on < Last date and time >. Technical bids shall be opened at the first instance and evaluated by technical committee. At the second stage financial bids of the only technically qualified bidders shall be opened for financial evaluation and ranking before awarding the contract. Mixing price bid with technical bid will disqualify your bid for further evaluation.

4. Submission of tender:

Offers addressed to the 'Registrar, IIT Ropar' and valid for 90 days should reach the office of 'The Registrar, IIT Ropar, Room No. 104' on or before the last date and time. Tenders received late shall not be considered.

5. Bidding:

a). Either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid.

b). If an agent submits bid on behalf of a Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.

All offers other than those from the Principal/OEM should be supported by an authority letter from the manufacturer authorizing the supplier to tender on their behalf. In case of manufacturer a certificate or a copy thereof to the effect that the bidder is a manufacturer of the equipment must be accompanied with the technical bid prepared as per 'Annexure – B'.

6. Opening of Bids:

Technical bids will be opened as per the above schedule in the presence of bidders or their authorized representatives whosoever may wish to attend. In case the due date of receipt/opening of the quotation/s (technical/price) is declared a holiday in the Institute, then, the due date of receipt/opening of the quotations shall be the next working day at the same time.

7. Price Bid:

Price bid should be prepared as per 'Annexure – E'.

8. Rates Comparison:

Bidders are requested to send their rates on FOR, IIT Ropar basis in case of indigenous items and on FOB/FCA basis in case of imported items with separately mentioning CIF/CIP charges. Rates comparision will be made on Net Price (Including Freight/ Insurance/Installation/Taxes/Duties etc.) if offers are received both for indigenous and import items. If offers are received only for import items then comparison will be made on FOB/FCA basis. Rates of available foreign currency will be taken from RBI website as on the opening of the technical bids for the purpose of conversion in Indian rupees.

9. Spares:

The spare parts/wear & tear consumables, if any, required for trouble free operation of equipment to be quoted separately giving the full nomenclature, rate, quantity and shelf life of each item.

10. Indigenous items:

The items which can/are to be provided indigenously may be listed separately.

11. Parts of Equipments:

Where the equipment is composed of several subunits/components, the rate should be quoted for each subunit/component. The Institute reserves the right to increase or decrease the number of subunits/components and number of equipment according to its requirements. The rates in ambiguous terms will render the quotation liable to rejection. The words “Not quoting” should be clearly written against any item of equipment for which the tenderer is not quoting.

12. Payment Terms:

Payment will be made to the supplier through following modes.

a). Indigenous goods:

NEFT/Cheque/Demand Draft : 90% payment will be made within 30 days from the date of receipt of material at IIT Ropar and balance 10% after successful installation of the equipment and on the submission of performance bank guarantee valid for warranty period + 3 months .

b). Imported goods:

Letter of credit/Telegraphic Transfer/Sight Draft – 90% payment will be made through LC/TT/SD and balance 10% after successful installation of the equipment and submission of performance bank guarantee for 10% of order value, either by the principal company or by their Indian agent valid for warranty period + 3 months.

Bank charges occured outside India will be borne by the beneficiary.

13. Acceptance of Terms & Conditions:

Bidders must confirm the acceptance of all the terms and conditions of this NIQ. Any non-acceptance or deviations from the terms and conditions must be clearly mentioned. However, tenderers must note carefully that any conditional offer or any deviation from the terms and conditions of this NIQ may render the quotation liable for rejection.

14. Service Manual/Curcuit Diagram

It is specifically required that the bidders will supply all the operating & service manuals and circuit diagrams alongwith the equipment.

15. Power Supply:

The equipment should be quoted only for 220 volts and 50Hz electricity supply. The extra requirement of line voltage, current rating etc. and the optimum climate and environment required for the equipment must be stated precisely. Voltage stabilizers/ isolation transformers/CVT/UPS etc., as may be required shall be listed separately. The full technical specifications and literature in respect of the voltage stabilizer etc., must be furnished.

16. Guarantee/Warranty and AMC:

Duly signed and stamped certificate of at least 5 years comprehensive onsite warranty as per Annexure-G should be attached with the technical bid. Successful firm will be required to agree for payment of penalty for exceeding permissible downtime during Guarantee / Warranty period. Annual Maintenance Contract charges for 5 years after the expiry of warranty period should be quoted as per Annexure-H. The AMC shall include Spares/Consumables, periodic visits and emergency visits. The rates of AMC will be taken into consideration while making rates comparison.

17. Country of origin:

Country of origin of the quoted item should be mentioned in the offer in case of imported item.

18. Customs Duty or Excise Duty:

IIT Ropar is exempted from the payment of Customs Duty/Excise Duty. CDEC/EDEC with DSIR certificate will be provided along with the order (If applicable).

19. Service Facility:

Bidder should mention about the service set up in India and how capable they are to provide after sales services.

20. Training:

If required, should be included in your offer without any extra cost.

21. Banker's details:

Name and address of the banker of your company should be mentioned.

22. Reference of supply:

Name and contact details of the premier educational Institutes where the quoted equipment has been installed in India should be attached as per Annexure-F during the last 5 years. Copies of at least two purchase orders may be attached(If possible). IIT Ropar reserves the right to inspect the equipment for its actual performance in any of the listed Institute. The list of installations with contact details for the last 5 years must be provided.

23. Arbitration

In the event of failure to carry out the contractual obligations, within the stipulated period or extended period and determination of the contract for any reason, violation of warranties etc. the IIT Ropar shall have the right to carry out the unfinished obligation at the exclusive cost and risk of the bidder/firm, after due notice and the difference so accrued shall be recoverable from the bidder/firm.

23.2 The provision of the Arbitration and Conciliation Act, 1996 or as at the relevant time and of rules framed there under and any statutory modifications thereof shall be deemed to apply and be incorporated in this agreement.

23.3 Upon every or any such reference, the cost of any incidentals to the reference and award(s) respectively shall be at the reasonable discretion of the Arbitrators or in the event of their not agreeing, of the Umpire appointed by them who may determine the amount thereof or direct the same to be fixed as between solicitors and client or as between parties and shall direct by whom and in what manner the same shall be borne and paid.

23.4 Panel of arbitrators will be provided by IIT Ropar out of which the bidder will have to select one.

23.5 The bidder shall have no objection if the officer who has dealt with the case at any stage is nominated as an arbitrator. Further, that one of the arbitrator's shall be Accounts Expert.

23.6 In case of vacancy being caused due to resignation, death or incapacity of the arbitrator(s) to function as such, the same shall be provided in the aforesaid manner and the new arbitrator(s) shall proceed from the stage at which vacancy is caused.

24. Jurisdiction:

The Courts of Ropar alone will have the jurisdiction to try any matter, dispute or difference between the parties arising out of this tender/contract. It is specifically agreed that no Court outside and other than Ropar court shall have jurisdiction in the matter.

25. Force Majuere:

Any failure of omission or commission to carry out the provision of this contract by the supplier shall not give rise to any claim by one party, one against the other, if such failure of omission or commission arises from an act of God; which shall include all acts of natural calamities such as fire, flood, earthquake, hurricane, or nay pestilence or from civil strikes, compliance with any statute and/or regulations of the Government, lockouts and strikes, riots, embargoes or from any political or other reason beyond the supplier's control including war (whether declared or not) civil war or stage of insurrection, provided that notice of the occurrence of any event by either party to the other shall be given within two weeks from the date of occurrence of such an event which could be attributed to Force Majuere conditions.

26. Risk & Cost

In the event of failure to carry out the contractual obligations, within the stipulated period or extended period and determination of the contract for any reason, violation of warranties etc. the IIT Ropar shall have the right to carry out the unfinished obligation at the exclusive cost and risk of the bidder/firm, after due notice and the difference so accrued shall be recoverable from the bidder/firm.

27. The material found defective upon opening by the supplier representative in presence of Central stores personnel/indenter of IIT Ropar or not as per tendered specifications will be lifted back at the cost and risk of the supplier. The material lying in the IIT Ropar premises would be at supplier's risk and cost.

28. Liquidated Damages:

In case the firm fails to execute the supply as per the purchase order in whole or in part as per the terms and conditions of PO, IIT Ropar can impose the penalty @1% per week of the undelivered stores, subject to a maximum of 10%. It will also be open to the institute to procure the required item(s) from any other source at the risk and expense of the firm.

29. Relocation:

The supplier has to stand guaranted for the relocation of supplied equipment once the permanent campus of IIT Ropar gets ready for operation. Transportation of the equipment will be provided by the Institute.

Note: The Director, IIT Ropar reserves the right to accept/reject any or all tenders without assigning any reasons thereof and also to reject the material if the same is not found conforming to the specifications, with further right to affect risk and cost of the purchases.

Registrar

Annexure – A (1)

HPC Infrastructure

1. Master/Login Nodes Qty: 2 (in high-availability configuration)

Processor: Two physical processors Intel Xeon 6142 or better, each having 16-cores or higher,running @ 2.6GHz or higher.
Memory: 192GB DDR4-2666 with ECC or higher in balanced configuration populating all memory channels. Must have free memory slots to upgrade to 512GB by adding memory modules
RAID: Support for Hardware RAID6, with 2GB flash backed cache
Disks: 2 x 480GB MLC SATA SSDs as RAID1
4 x 4TB, 7200RPM SATA HDDs as RAID6
All disks must be hot-pluggable and enterprise/data center grade and connected to RAID controller
Optical Disk: DVD-ROM drive (internal only)
NIC: 2 x 10 Gigabit (RJ45) backward compatible with 1000Base-T
Interconnect : 1 x 100Gbps (or higher) low-latency interconnect (Mellanox EDR InfiniBand or Intel® Omni-Path) connected to PCIe 3.0 x16
Management: Dedicated management port with KVM over LAN support enabled
Expansion: 2 x free PCIe x16 expansion slots
Ports: 1 Serial, 2 USB, 1 VGA
Form Factor: Rack-mountable with rail-kit. 2U or lower
Power Supplies: hot-pluggable and N+N redundant, 80 PLUS Titanium or better.

2.ComputeNode(s) Qty: 250 Nodes

Processor: Two physical processors Intel Xeon 6142 or better, each having 16-cores or higher,running @ 2.6GHz or higher.
Memory: 192GB DDR4-2666 with ECC or higher in balanced configuration populating all memory channels. Must have free memory slots to upgrade to 512GB by adding memory modules
Disks: 2 x 120GB MLC SATA SSD
All disks must be hot-pluggable and enterprise/data-centre grade
NIC: 2 x 10 Gigabit (RJ45) backward compatible with 1000Base-T
Interconnect: 1 x 100Gbps (or higher) low-latency interconnect (Mellanox EDR InfiniBand or Intel® Omni-Path) connected to PCIe 3.0 x16
Management: Dedicated management port with KVM over LAN support enabled
Expansion: 1 x PCIe x16 expansion slot
Ports: 2 USB, 1 VGA
Form Factor: Rack-mountable with rail-kit. Dense multi-node systems with either 2 nodes in 1U or 4 nodes in 2U
Power Supplies: hot-pluggable and N+N redundant, 80 PLUS Titanium or better. Each set of 'N' Power supplies should be rated for supplying at least 500W to each individual System in the chassis

3. Parallel File System **Qty: 1 set**

Parallel file system based on Lustre with 450TB usable space and with a performance of 6GB/s or higher (with linear upgrade in performance with future expansion). The performance needs to be demonstrated using IOR with 1MB block size.

The solution must have no single point of failure and must be connected to the HPC and Hadoop setup outlined in this tender using 100Gbps (or higher) low-latency interconnect (Mellanox EDR InfiniBand or Intel® Omni-Path). The solution must comprise of at-least 4 I/O servers (2 Metadata servers and 2 Object Storage Servers) as below

A. MetaData Servers **Qty: 2**

Processor: Same processor as Compute Nodes

Memory: 192GB DDR4-2666 with ECC or higher in balanced configuration populating all memory channels.

Disks: 2 x 240GB MLC SATA SSDs in RAID1

All disks must be hot-pluggable and enterprise/datacentre grade

NIC: 2 x 10Gigabit (RJ45) backward compatible with 1000Base-T

Interconnect: 1 x 100Gbps (or higher) low-latency interconnect (Mellanox EDR InfiniBand or Intel® Omni-Path) connected to PCIe 3.0 x16

Management: Dedicated management port with KVM over LAN support enabled

Ports: 2 USB, 1 VGA

Form Factor: Rack-mountable with rail-kit. 2U or lower

Power Supplies: hot-pluggable and N+N redundant, 80PLUS Titanium or better.

B. MetaData Target **Qty: 1**

Disks: 9TB or higher usable space with RAID10/1E or equivalent using SAS 10K

RPM disks and with one hot-spare. All disks must be hot-pluggable and enterprise/datacentre grade

Connectivity: Connected to both the Metadata Servers for high-availability configuration Using 16Gbps (or higher) links

Form Factor: Rack-mountable with rail-kit. 2U or lower

Power Supplies: hot-pluggable and N+N redundant.

C. Object Storage Servers **Qty: 2**

Processor: Same processor as Compute Nodes

Memory: 192GB DDR4-2666 with ECC or higher in balanced configuration populating all memory channels.

Disks: 2 x 240GB MLC SATA SSDs in RAID1

All disks must be hot-pluggable and enterprise/datacentre grade

NIC: 2 x 10Gigabit (RJ45) backward compatible with 1000Base-T

Interconnect: 1 x 100Gbps (or higher) low-latency interconnect (Mellanox EDR InfiniBand or Intel® Omni-Path) connected to PCIe 3.0 x16

Management: Dedicated management port with KVM over LAN support enabled
Ports: 2 USB, 1 VGA
Form Factor: Rack-mountable with rail-kit. 2U or lower
Power Supplies: hot-pluggable and N+N redundant, 80PLUS Titanium or better.

D.ObjectStorageTarget
Qty: 1
Disks: 450TB or higher usable space (should be 500 TB or more) with RAID6 or equivalent using SAS 7.2K
RPM disks and with two hot-spare disks. All disks must be hot-pluggable and enterprise/data center grade.
Connectivity: Connected to both the Object Servers for high-availability configuration Using 16Gbps (or higher) links
Form Factor: Rack-mountable with rail-kit. 4U or lower
Power Supplies: hot-pluggable and N+N redundant.

4. Communication Network

A. Primary Communication Network **Qty: 1 set**
Minimum 230-port, 100Gbps, Non-blocking, Switching Fabric (Mellanox EDR InfiniBand or Intel®Omni-Path) with embedded Subnet Manager for 230 devices or more and with redundant power supply/supplies. All cables required for connecting the devices quoted in this tender should be included/bundled
B. Secondary Communication Network
Qty: 4 sets
52-port, Layer-2 managed , Gigabit Ethernet Switch with rack-mounting kit
All cables required for connecting the devices quoted in this tender should be included/bundled

5. KVM Switch/Console
Qty: 1 set
1 x KVM console with a 17" LED-backlit LCD monitor in a sliding housing, 1U rack-mountable

6. Software/Installation

OS: 64-bit Linux (CentOS/RHEL)
Job Scheduler: Job Scheduler with following features
· job monitoring and management
· Workload cum resource manager with policy-aware, resource-aware and topology-aware scheduling
· Advance reservation support
· Heterogeneous cluster support
· Multi-cluster support
· Preemptive and backfill scheduling support
· Application integration support
· Live reconfiguration capability

· GPU Aware scheduling
Libraries: OpenMPI, MVAPICH, Intel MPI, Blas 1,2,3, Lapack, Scalapac, Intel MKL, Intel DAAL
Compilers: GNU Compilers
Intel C/C++/Fortran compilers, 2 user floating license, with 3 years of support
HPC Mngmt: Cluster Management software with following features
· Cluster manager with provisioning, monitoring and reporting capabilities
· Support Package and Image based provisioning
· Support Disk and diskless cluster deployment
· Intuitive web interface to manage and customize the cluster
· Customizing networks and compute node profiles
· Customizing compute nodes to max, up to changing kernel parameter
· Able to Push configuration changes and updates to the compute nodes without reinstalling and rebooting
Installation: The vendor has to rack-mount all equipment with proper cabling and configure the system as a high-performance compute cluster. The vendor is required to run HPL and submit results as part of acceptance. The vendor will also be required to submit documentation with details about the installation and provide training on day to day operations and administration of HPC.

7. Benchmark:
The following benchmarks are to be submitted for the proposed HPC system on the proposed configuration or closest available configuration at the time of the bid. Vendor will have to reproduce the submitted benchmark results onsite (with in 5% accuracy) after installation.

- LINPACK benchmark for peak performance
- Third party benchmark (IOR/IOZone) for storage (demonstrating required performance) should be provided with bid and to be reproduced onsite.
- Attached application benchmarks (Annexure-2)

II. PART2 – Cooling Solution Infrastructure -- We already have dedicated precision AC's for server room [OEM has to visit the site to calculate actual load before providing the solution]
i) High Density and energy efficient precision cooling units with N+1 redundancy at the physical unit level to take care of minimum 140KW operating power load at any time cooling provided by the redundant /stand by unit not to be the part of estimated capacity of cooling solution.
ii) Indoor and Outdoor units shall be connected with copper piping work
iii) Outdoor Cooling Units (if any) have to be positioned on top of the building.

III. PART3 – Power Backup Solution Infrastructure -- We already have dedicated UPS for server room [OEM has to visit the site to calculate actual load before providing the solution]
i) 200 KVA standalone, online double conversion, 3 phase UPS with full (N+N) redundancy,and 20 minutes of Runtime (power backup) on each UPS under full load.
ii) With industrial grade battery bank (dry and maintenance free). Sealed

Maintenance free.
iii) SNMP control, high power factor (0.9 or more), high efficiency (0.92 or more), sine wave output.

Currently IIT Ropar has 16 Rack space available with approx. 5KW cooling capacity /rack. 90KW (30KW*4 Units) cooling capacity (heat load cooling capacity is distributed over 16 Racks) in N+1 redundancy. Bidder has to fit in the solution in these racks with power capacity (approx. 5KW/rack) specified / rack or he needs to propose an entirely new solution for cooling and racks. Even if bidder wants to use some of the existing infrastructure and wants to bring in additional cooling units with same or better air cooled technology that at any given circumstance the bidder shall not put more than 14KW/rack of IT load. Bidder has to submit detailed DC floor layout along with details of cooling unit, medium of cooling, cooling unit vs IT load calculation.

- The proposed cooling solution should use only one cooling medium for the entire compute server infrastructure, if bidder is using the existing cooling infra then the additional cooling infrastructure provided by him should be air cooled only.
- If bidder needs additional cooling or racks then they should incorporate the same in accordance with their solution. Uniformity of the entire solution in terms of per rack cooling capacity needs to be maintained.
- In case of power outage if equipment such as Chiller / air-conditioning stops, in that situation ICT compute equipment must run under safe operating temperature for min 15 min.
- Monitoring in Auto mode for abnormal pressure, leaking coolant, humidity should be there in proposed cooling solution
- Humidity control system to avoid formation of any dew drops, humidity level should be maintained between 5%~95% RH.
- The bid will be evaluated on techno-commercial basis, better technical solution will be given weightage as follows :

a) The commercial bid will be evaluated basis the TCO for the entire solution over a period of 5 / 7Years.

b) TCO will be calculated on three criteria's :-

1.ICT Equipment power consumption
2.Power requirement for cooling the ICT equipment heat load
3.Foot print / Space occupied in the Data Centre.

Ø ICT Equipment power consumption : Bidder has to specify the supplied ICT equipment power load at full capacity of the system. Same will be calculated for 5/7 Year and the unit rate will be considered as 20 Rs and same will be added to the bid value of the bidder.

Ø Power requirement for cooling the ICT equipment heat load: Bidder has to specify the cooling requirement for the supplied ICT equipment at full load in BTU/Hr. Same will be calculated for 5/7 Year and will be converted to tonnage and subsequently power consumption of 2 KW per tonnage will

be considered. The unit rate will be considered as 20Rs and same will be added to the bid value of the bidder.

Ø Foot print / Space occupied in the Data Centre : Bidder has to specify the total footprint in square meter used for the proposed solution (including cooling equipment, any existing equipment and any non-usable DC space due to the proposed solution) inside the DC. 200 Watt /square meter power consumption will be considered and will be calculated for 5/7 years. The unit rate will be considered as 20Rs and same will be added to the bid value of the bidder.

Since safety is of utmost importance and the proposed DC is going to use a very high density of compute infrastructure, the bidder has to give the necessary solution for compute infrastructure on fire proof technology or else necessary fire extinguisher solution based on NOVEC should be provided.

General Terms & Conditions

1. The vendor should have installed at least 5 compute clusters in India in last three years. Details of these previous installations must be provided. In addition, vendor should provide a guarantee for clustering and also for application software integration.
2. OEM has to feature in the top 500 supercomputer sites (available at www.top500.org) with at least 10 installations in the June 2017 (Latest) list and at least five installations in each list published since last three years
3. The proposed cluster solution must be delivered to IIT Ropar within eight weeks from the opening of LC
4. The cluster must be installed to the satisfaction of IIT Ropar within two weeks from the date of delivery
5. The Vendor should have been in existence for at least five years and should have well established service/support center in India with trained HPC manpower. SI should provide details on technical support infrastructure along with the names of 2 certified HPC engineers.
6. The vendor should provide one trained certified system administrar, with minimum qualification of BE/BTech/MCA/MTech with 2 years experience of working in HPC environment, to be deployed at IIT Ropar to carry out system and network administration, application installation, security monitoring, system fine-tuning on everyday basis. Trained manpower will follow rules and regulations of IIT Ropar. The proposed manpower should be involved in the system installation process, and should be deployed for a period of 60 months starting from the beginning of the installation process. The manpower cost should be quoted separately.
7. Bidder shall provide user and admin training to customer at customer site in two separate sessions or more for 02 days. The vendor should give the power and cooling requirements for the cluster solution along with the proposal. Requirement for minimum cooling and power would be preferred.
8. Equivalent (or better) hardware/software can be allowed at the discretion of IIT Ropar. However, in such cases, the vendor must provide sufficient justification for the deviation from the specifications given here.

9. The bidder should have experience in installing/fine tuning our applications like Gaussian, NAMD, CPMD, Jaguar (Schrodinger), Amber, MatLab, VASP etc.
10. The bidder should submit the project schedule for the installation of the proposed cluster.
11. HPC Cluster Management suite must have extensive cluster monitoring capability to drill down to a node-level performance parameters using intuitive GUI and with well-designed graphical reports.
12. Warranty period (minimum 5 years comprehensive on-site warranty on complete High performance Computing stack) should be mentioned.
The vendor is also required to maintain integration of licensed software (if any) with the cluster throughout the warranty period. Installation and maintenance charges should be mentioned, if applicable.
13. The OEM and bidder should have presence in the Top Supercomputers-India list (maintained by SERC, IISc, Bangalore http://topsupercomputers-india.iisc.ernet.in) continuously for last three years.
14. The OEM/bidder should have installed at least one supercomputer of 7 TFLOPS (Rpeak) capability (contribution from CPU-only nodes) in India. The same should have been successfully supported (post-installation) at least for a period of one year. Provide a certificate from the customer to this effect.
15. The OEM/bidder should have installed at least one supercomputer in India with Infiniband/equivalent or better interconnect.
16. The bidder should have proven record of having demonstrated their competence and capability, to deliver all the services expected during the contract period.
~~17.~~ The OEM must have their sales/service operations in India for last 05 years and the team structure with call logging details and escalation matrix has to be provided.

Annexure – A (2)

Application benchmarks:

The following application benchmarks should be submitted along with the bids. Vendor will have to reproduce the submitted benchmark results on site (within 5% accuracy) after installation. All benchmarks must conform to the following :

1. All benchmarks must be performed on either the proposed configuration or the closest available configuration having the processor menstioned in the original tender (eg. Intel SkyLake 6142 series CPU (with at least 16 cores each running at 2.6 GHz).

2. Each node used in the benchmark should have at least 192 GB DDR4-2666 with ECC of memory available.

3. Scaling performances should be tested only over Infiniband EDR / Intel OPA networks.

4. Scaling performances must include at least one single node test (using all CPUs), one test distributed over nodes in a single switch and one test distributed over nodes across switches.

5. Details of benchmark configurations and results must be submitted along with the technical bid.

6. All benchmarks must be performed with pure MPI parallelization and without TURBO mode (or hyper- threading) enabled.

7. Use the latest versions of all applications below for benchmarking.

8. Clearly mention the application version used, compilation conditions, memory configurations, processor type and details, and any optimisation parameters used.

Benchmark 1: Quantum ESPRESSO

Benchmarks on two systems are required. System 1: Au Surface with 112 atoms (small size)

http://qe-forge.org/gf/download/frsrelease/45/78/AUSURF112.tgz

System 2: Ir/Graphene interface with 443 atoms (medium)

http://qe-forge.org/gf/download/frsrelease/47/61/GRIR443.tgz

Optionally, please also provide benchmark on System 3 : Ir/Graphene interface with 443 atoms (medium)

http://qe-forge.org/gf/download/frsrelease/48/62/GRIR686.tgz

Performance benchmarks should be provided as CPU time taken per SCF iteration. Task- group level parallelization is to be avoided (please mention if used). For details on how to run and collect information please see **https://hpc-forge.cineca.it/files/gara_Tier0_2015/public/QuantumEspresso/README**

Scalability over processors should be tested and reported over the following: **(1)** 1 node (with 24 cores or more) **(2)** 48 cores **(3)** 72 cores

(4) 96 cores **(5)** 192 cores **Benchmark 2** : ALLPATHS-LG (for high-memory SMP node)

Please provide a benchmark of the Parallel Sort Text as detailed in

http://software.broadinstitute.org/allpaths-lg/blog/?page_id=331

The related data-sets and compilation instructions are provided at

http://software.broadinstitute.org/allpaths-lg/blog/?page_id=12

The following benchmark objectives are desired

• To study the performance of calculations and its dependence as a function of the size of the input file as well as a function of the number of cores.

• To study the scalability of the process on the high-memory SMP node.
Program to be tested: ALLPATHS-LG - available at
http://software.broadinstitute.org/allpaths- lg/blog/?page_id=12

- using default parameters on a 100X human genome dataset. Details:
ALLPATHS-LG needs to be compiled and run using the

1. Test dataset supplied with ALLAPTHS-LG

2. M. Zebra genome dataset from the Short read archive as a test. Details are given here: http://software.broadinstitute.org/allpaths-lg/blog/?page_id=12

3. C.corone genome datasets from the Short read archive as a test. Following SRX files to be used to achieve the required coverage.

SRX ID: SRX286216, SRX286215, SRX286214, SRX286211, SRX283200
Sample ID: SAMN02143031

Memory (GB)	Number of cores	Peak memory usage
1024	96	
512	48	
256	24	
16	12	
8	6	

In addition to this, for high memory node, scaling (1 to maximum cores) with the number of processors & memory of comparable performance of the

ParallelSortTest benchmark would be required. The data to be provided as mentioned below

http://software.broadinstitute.org/allpaths-lg/blog/?page_id=331

Command: ParallelSortTest X=4 **Benchmark values** (Based on three successive iterations, essentially no other activity on machines).

Time (sec)	Memory (GB)	Number of cores

Annexure : B

Technical Compliance Sheet

Specifications	**Compliance of quoted model**	**Compliance of alternate model**	**Remarks (Deviations)**

Annexure: C

FORMAT FOR MANUFACTURER'S AUTHORISATION CERTIFICATE

To,
The Registrar
Indian Institute of Technology Ropar
Nangal Road, Rupnagar-140001

Sub. : Tender for "_____".

Dear Sir,

We,_____, who are established and reputed manufacturers of _____, having factory/office at_____, hereby authorize M/s _____ [name & address of agents/distributors] to bid, negotiate and conclude the order with you for the above goods manufactured by us.

We shall remain responsible for the tender/Agreement negotiated by M/s _____, jointly and severely. No company or firm or individual other than M/s _____ are authorized to bid, negotiate and conclude the order in regard to this business against this specific tender as for all business in the entire territory of India.

An agency commission of ____% included in the FOB price is payable to M/s _____. We hereby extend our full guarantee and warranty as per the terms and conditions of tender for the goods offered for supply against this invitation for bid by the above supplier.

1. _____

2. _____

*specify in detail manufacturer's responsibilities+the services to be rendered by M/s_____ are as under:

i) _____

ii) _____

[Specify the services to be rendered by the agent/distributor] In case duties of the agent/distributor are changed or agent/ distributor is changed it shall be obligatory on us to automatically transfer all the duties and obligations to the new Indian Agent failing which we will ipso-facto become liable for all acts of commission or omission on the part of new Indian Agent/ distributor.

Yours faithfully,

[Name & Signature]
For and on behalf of M/s. _____ [Name of manufacturer]

Note: This letter of authorization should be on the letterhead of the manufacturing concern and should be signed by a person competent and having the power of attorney to bind the manufacturer.

Annexure: D

FORMAT FOR NON BLACKLISTING OF SUPPLIER

I/ We _____Manufacturer/partner/Authorized Distributor/Agent (strike out which is not applicable) of (Supplier) _____ do hereby declare and solemnly affirm that the individual/firm/company is not black-listed by the Union/State Government/Autonomous body.

Deponent

Address _____

I/ We hereby solemnly declare and affirm that the above declaration is true and correct to the best of my knowledge and belief. No part of it is false and nothing has been concealed.

Deponent

Dated: _____

(Note: To be furnished on non-judicial stamp paper duly attested by the Oath Commissioner.)

Annexure: E

FORMAT FOR THE SUBMISSION OF RATES – PRICE BID

(To be submitted on the letterhead of the company/firm)

Name of the Equipment _____

Name of the Manufacturer _____

Make of the Equipment _____

Model Number _____

County of Origin _____

Sl. No.	Particulars	Rate/Unit
1	Cost of the equipment with 5 years comprehensive warranty (FOB value including Indian Agency Commission)	
2	Air freight, Insurance charges etc. (In case of import item)	
3	Total CIF value up to New Delhi Airport (In case of import item)/ Total FOR IIT Ropar value (In case of indigenous item)	
4	AMC charges for 1st year after expiry of warranty	
5	AMC charges for 2nd year after expiry of warranty	
6	AMC charges for 3rd year after expiry of warranty	
7	AMC charges for 4th year after expiry of warranty	
8	AMC charges for 5th year after expiry of warranty	
9	Percentage of Indian Agency Commission (IAC) payable to the Indian Agent, if any (In case of import item).	
10	FOR charges in Rupees including clearance, loading & unloading, transportation and insurance from New Delhi Airport to IIT Ropar (In case of import item)	
11	Packing dimension of the equipment	
12	Gross weight of the equipment after packing	

This is certified that the rates quoted above are not more than the rates charged from any other Institute/ Department/Organization.

Note:
1. Taxes and other levies, if any are to be clearly specified in the bid.

Annexure: F

PROFORMA FOR USER/CLIENT LIST

Sl. No.	Name & full address of purchaser	Purchase Order No. & Date	No. of Units (Qty)	Model No. with Date of Installation	Contact person with cell, phone and e-mail id

Annexure: G

CERTIFICATE OF WARRANTY

i). I/We certify that the warranty shall be for a period of 5 years comprehensive onsite warranty starting from the date of satisfactory installation, commissioning and handing over of the equipment and of the works conducted therewith covered under the supply order in working order. During the warranty period, I/we shall provide free "after sale service" and the replacement of any part(s) of the equipment or rectification of defects of work of the equipment will be free of cost. The replacement of the parts shall be arranged by us, at our own cost and responsibility. We undertake that the above warranty shall begin only from the date of satisfactory and faultless functioning of the equipment for 60 days at IIT Ropar premises. The benefit of change in dates of the warranty period shall be in the interest of the use/your organization.

ii). During the warranty period, we shall provide at least 3 preventive maintenance visits.

iii). Uptime Guarantee: During the warranty period, we will be responsible to maintain the equipment in good working conditions for a period 345 days (i.e. 95% uptime) in a block of 365 days.

a). All complaints will be attended by us within 2 weeks of receipt of the complaint in our office.

b). In case there is delay of more than 2 weeks in attending to a complaint from our side then you can count the number of days in excess of the permissible response time in the downtime. The above said response time of 2 weeks for attending to a complaint by us will not be counted in the downtime.

c). Penalty: We shall pay a penalty equivalent to 0.1 % of the FOB value of the equipment for every week or part thereof delay in rectifying the defect.

Note: The right to accept the reason (s) for delay and consider reduction or waive off the penalty for the same shall be at the sole discretion of Director, IIT Ropar

iv. We certify that the equipment being/quoted is the latest model and that spares for the equipment will be available for a period of at least 10 years and we also guarantee that we will keep the organization informed of any update of the equipment over a period of 10 years.

v. We guarantee that in case we fail to carry out the maintenance within the stipulated period, IIT Ropar reserves the right to get the maintenance work carried out at our risk, cost and responsibility after informing us. All the expenses including excess payment for repairs/maintenance shall be adjusted against the Performance Bank Guarantee. In case the expenses exceed the amount of Performance Bank Guarantee, the same shall be recoverable from us with/without interest in accordance with the circumstances.

vi. We shall try to repair the equipment at IIT Ropar premises itself. However, the equipment will be taken to our site on our own expenses in case it is not possible to repair the same at IIT Ropar. We shall take the entire responsibility for the safe custody and transportation of the equipment taken out for repairs till the equipment is rehabilitated to the IIT Ropar after repair Any loss of equipment or its accessories under its charge on account of theft, fire or any other reasons shall be at our sole risk and responsibility which will be compensated to IIT Ropar for such losses at the FOB/CIF value for the damaged/lost equipment/part, including accessories.

vii. We undertake to perform calibration after every major repair/breakdown/taking the equipment for repair out of IIT Ropar premises.

viii. In case of extended warrantee, we undertake to carry out annual calibration of the equipment.

ix. We guarantee that we will supply spare parts if and when required on agreed basis for an agreed price. The agreed basis could be an agreed discount on the published catalogue price.

x. We guarantee to the effect that before going out of production of spare parts, we will give adequate advance notice to you so that you may undertake to procure the balance of the life time requirements of spare parts.

xi. We guarantee the entire unit against defects of manufacture, workmanship and poor quality of components.

Annexure: H

TERMS AND CONDITIONS OF THE SERVICE CONTRACT

1. During the service contract period, the firm shall provide at least 3 preventive maintenance visits per year and attended to all emergent and break-down calls.
2. The service contract charges must be quoted separately for each year strictly as under and quoting of rates in ambiguous terms or in percentage terms etc. shall render the tender liable to rejection :
3. Rate for 1st year = _____ (Rupees in words).
   Rate for 2nd year = _____ (Rupees in words).
   Rate for 3rd year = _____ (Rupees in words).
   Rate for 4th year = _____ (Rupees in words).
   Rate for 5th year = _____ (Rupees in words).
4. The service contract charges should be quoted only for services and travel cost etc. and should not include the cost of any replacement parts/components which shall be arranged by the IIT ROPAR at its own cost.
5. In each block of 365 days during the entire service contract period the firm will be responsible to maintain the equipment in good working condition for a period 350 days (i.e 96% uptime). The time taken by the IIT ROPAR in providing to the firm the spare parts shall not count towards the down time. All the complaints will be attended by the firm within 2 working days of the dispatch of the complaint to their office. In case there is delay of more than 2 working days in attending to a complaint then the number of days in excess of the permissible response time shall be counted in the downtime. In case total downtime exceeds the permissible downtime a fine equivalent to double the service contract charges shall be recovered from the firm on per day basis.
6. The right to accept the reason(s) for delay and consider reduction or waive off the penalty for the same shall be at the sole discretion of Registrar, IIT Ropar.
7. We undertake to carry out annual calibration of the equipment.
8. We undertake to perform calibration after every major repair/breakdown/taking the equipment for repair out of IIT Ropar premises.
9. The replaced parts shall remain the property of the IIT Ropar.
10. The firm shall try to repair the equipment at IIT Ropar itself. However, the equipment may be taken to their site, on their own expenses if in case it is not possible to repair the same at IIT Ropar. The firm shall take the entire responsibility for the safe custody and transportation of the equipment taken out for repairs till this is handed over the purchaser after repair. Any loss of equipment or its accessories on account of theft, fire or any such reasons shall be the sole risk and responsibility of the firm who will compensate the IIT Ropar for such losses at FOB value of the damaged/lost equipment/part including accessories.
11. During the service contract period the parts/components that may be needing replacement shall made available by the IIT Ropar at their own expenses and all import formalities, payment of customs duty etc., shall be complied with/borne by the IIT Ropar.
12. All service contract charges will be invoiced twice in each year. The payment of the invoice will be made afterwards.
13. No price revisions will be accepted by the IIT Ropar during the entire tenure of the service contract agreement.
14. AMC contains both hardware and software troubleshooting.