

CORRIGENDUM / ADDENDUM

REF: E-tender No. (NIT-37/2017) NC-000456-PHY-17-18

ITEM: HIGH PERFORMANCE COMPUTING CLUSTER

(A) The following changes have been made in the submission and opening of tender date and time.

- i) The date of submission of e-bid is extended till 05/03/2018 up to 11.30 am
- ii) The date of opening of technical bid is extended till 05/03/2018 up to 2.30 pm

(B) The following changes have been made in the Technical bid of tender documents

- i) In Technical bid part-1 **General information**, Terms of delivery: CIP/CIF for foreign currency order has been added in Sl.No. 14
- ii) In Technical bid part-1 General Information, information for 13 points have been revised to 19 points by asking more information.

(C) The following changes have been made in the Terms and Conditions Part – 1 of Tender document file.

- i) In Terms & Conditions Part-1, Sl.No.1 has the modification of should have satisfactorily completed at least two **similar supplies and installation** with 15 Teraflop infiniband cluster having Parallel File System (PFS)
- ii) Sl.No. 16 **Scope of work:** have been modified as Installation of cluster with parallel file system, Scheduler, Resource manager, Scientific libraries, Scientific software etc.
- iii) In Sl.No. 18, Installation, Warranty & Support, please read **OEM** instead of **bidder** and the time period should be **7 years** instead of **10 years**.

(D) The Technical Specification has been revised. Revised technical specification has been uploaded.

(E) The following changes have been made in the Financial bid of tender documents

- i) In the Financial bid **please read CIP/CIF Kolkata charges** instead of CIP Kolkata charges

Rest terms and conditions of the above mentioned e-tender will remain unchanged

Stores & Purchase Officer



राष्ट्रीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, भुवनेश्वर
(परमाणु उर्जा विभाग, भारत सरकार का एक स्वयं शासित संस्थान)
NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
(AN AUTONOMOUS INSTITUTE UNDER DEPT. OF ATOMIC ENERGY, GOVT. OF INDIA)

Notice Inviting E-Tender No. 37/2017-NC-000456-PHY-17-18 (2 Part Tender)

HIGH PERFORMANCE COMPUTING CLUSTER

Cost of Tender is 1500.00 (Non Refundable)

Paper Notice



**NATIONAL INSTITUTE OF SCIENCE EDUCATION & RESEARCH
JATNI CAMPUS, P.O. - JATNI
KHURDA – 752050, ODISHA, INDIA**

Notice Inviting E-Tender No. 37/2017-NC-000456-17-18 (2 Part Tender)

Sealed Tenders are invited on behalf of the Director, National Institute of Science Education and Research, Jatni from the manufacturers(Indian or Foreign) and their authorised reseller/Indian agent only for supply & installation of the following items:-

Sl. No.	Name of the Items	Tender No.	Name of Department	Indent No.	Qty.	EMD in INR
01	High Performance Computing Cluster	NIT-37/2017	School of Physical Sciences	NC-000456-PHY-17-18	01 No.	1,30,000.00

Tender can be downloaded and bided from website address: www.tenderwizard.com/NISER. Tender documents for viewing only is also available in NISER web-site address: www.niser.ac.in.

Stores & Purchase Officer



**NATIONAL INSTITUTE OF SCIENCE EDUCATION & RESEARCH
JATNI CAMPUS, P.O. – BHIMPUR-PADANPUR, VIA-JATNI
KHURDA – 752050, ODISHA, INDIA**

Notice Inviting E-Tender No.37/2017-NC-000456-PHY-17-18 (2 Part Tender)

E- Tenders are invited on behalf of the Director, National Institute of Science Education and Research, Jatni from the manufacturers(Indian or Foreign) and their authorised reseller/Indian agent only for supply & installation of the following items:-

Sl. No.	Name of the Items	Tender No.	Name of Department	Indent No.	Qty.	EMD in INR
01	High Performance Computing Cluster	NIT-37/2017	School of Physical Sciences	NC-000456-PHY-17-18	01 No.	1,30,000.00

NB: PARTIES REGISTERED WITH SSI/DGS&D/DAE AND FOREIGN PARTIES QUOTING DIRECTLY ARE EXEMPTED FROM PAYING EMD. There is no exemption for TENDER FEE.

Standard eTender Terms & Conditions

1. The details of tender notification can be downloaded from www.tenderwizard.com/NISER under "**Tender Free View**" link.
2. Vendors should obtain the USER ID and PASSWORD from www.tenderwizard.com/NISER by clicking on "**REGISTER ME**" link in the homepage.
3. The Vendor registration fee has to be paid to ITI Ltd for Rs. 1180/- including GST using the e-payment link provided at the time of registration, and the mode of payments are Credit Card, Debit Card and Internet Banking. Vendor Registration is Valid for 01 year.
4. For further details on e-Tender participation, please contact ITI Help desk on
 - Telephone: 080-49352000/9686115318
 - Email: harishkumar.kb@etenderwizard.com, ambasa@etenderwizard.com.
5. Tenders should be submitted only through e-Tender portal and obtain the Tender Acknowledgement copy as a proof of successful submission.

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**NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
NIT OPEN DOCUMENT (2 PART BID)**

**SUPPLY & INSTALLATION OF
HIGH PERFORMANCE COMPUTING CLUSTER**

Notice Inviting E-Tender No.37/2017-NC-000456-PHY-17-18 (2 Part Tender)

National Institute of Science Education & Research (NISER), Jatni is an Autonomous Institute under Dept of Atomic Energy. NISER would like to procure the following equipment. The Technical Specifications Schedule of Requirements and Allied Technical details are given in Part-1 of tender document.

•Item: HIGH PERFORMANCE COMPUTING CLUSTER

• Tender Enquiry No: NIT-37/2017

• Last date of submission of e-bid- 23.02.2018 upto 11.30 A.M

• Opening of Technical Bids: 23.02.2018 at 2.30 P.M

• Date and Time of Pre-Bidding – 09.02.2018

E-tenders are invited for supply and installation of **HIGH PERFORMANCE COMPUTING CLUSTER** in the National Institute of Science Education & Research, Jatni.

**(Deepak Srivastava)
Stores & Purchase Officer**

The Institute can provide following documents.

- 1. Custom Duty exemption certificate.**
- 2. GST Exemption Certificate**

COST OF TENDER IS RS. 1500/- (NON REFUNDABLE).

**This is payable in cash or Demand Draft of a scheduled Bank in favour of
Director, NISER payable at Bhubaneswar/Jatni**



PART - 1
TERMS & CONDITIONS
FOR SUPPLY AND INSTALLATION OF
HIGH PERFORMANCE COMPUTING CLUSTER
FOR
NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, JATNI
Notice Inviting E-Tender No. 37/2017-NC-000456-PHY-17-18 (2 Part Tender)

1. Director, National Institute of Science Education & Research, Jatni (NISER) invites sealed tenders for **HIGH PERFORMANCE COMPUTING CLUSTER** from the Manufacturer and their authorised reseller only having following credentials.
 - A. Should have satisfactorily completed **similar supply** (at least one of them in Central Government/Central Autonomous Body/Central PSU)
 - B. Similar or Similar Nature of work means** Supply & Installation of **HIGH PERFORMANCE COMPUTING CLUSTER** for any of the following :
 - a) **Government/Autonomous Institutions**
 - b) **Government Research Centres**
 - c) **Universities**
 - d) **Autonomous/Reputed Private Research Centres**
 - e) **Purchase Orders / Completion certificates if any, for supporting above requirements.**

The Bidders are requested to give detailed tender in the prescribed forms in two Bids
i.e. Part - I Technical Bid.
Part - II Commercial Bid.

2. **Contact for information:** (Only E-mail enquiries will be entertained)

For Technical Information of HIGH PERFORMANCE COMPUTING CLUSTER:

Dr. R.Singh,
Scientific Officer,
School of Physical Sciences, NISER.
E-Mail – ranbir.singh@niser.ac.in

For Information regarding Commercial & all other Terms & Conditions:

Sh. Deepak Srivastava
Stores & Purchase Officer
National Institute of Science Education & Research, Jatni
E-Mail-spo@niser.ac.in

3. Supply means:

“Supply, Installation, Commissioning and satisfactory demonstration of the whole equipment”.
If any charges extra are payable for Installation and Commissioning, the same should be specified in the commercial offer.

4. Tender Document:

The Technical Offer should comprise of the following:

- a) Tenders, which are submitted without following the Two-Bid Offer System, will summarily be rejected.
- b) The technical offer should be complete to indicate that all products and services asked for are quoted. Each page of the bid and cutting/corrections shall be duly signed and stamped by the

bidder. Unsigned Tenders will also be rejected. Failure to comply with this requirement may result in the bid being rejected.

- c) The purpose of certain specific conditions is to get or procure best product/service etc. for NISER. The opinion of Technical Committee shall be the guiding factor for technical short listing.
- d) The earnest money deposit as indicated against the item should be sent by post so that it reaches on or before the opening of the technical bid for e-tender system in the form of Account Payee Bank Draft payable on any branch of Nationalised/Schedule Bank at Bhubaneswar/ Jatni in favour of “Director, National Institute of Science Education & Research, Jatni”, in a separate sealed envelope. All tenders submitted without requisite amount of earnest money shall be rejected and their technical and financial bids shall not be opened. No interest is payable on EMD. The EMD will be returned to the bidders(s)/Agents whose offer is not accepted by NISER within one month from the date of the placing of the final order(s) on the selected bidder(s). In case of the bidder(s) whose offer is accepted the EMD will be returned on submission of Performance Bank Guarantee (if applicable). However, if the return of EMD is delayed for any reason, no interest /penalty shall be payable to the bidders.

EMD EXEMPTION:

PARTIES REGISTERED WITH SSI/DGS&D/DAE AND FOREIGN PARTIES QUOTING DIRECTLY ARE EXEMPTED FROM PAYING EMD. FOREIGN PARTIES QUOTING DIRECTLY UNDER ORIGINAL SEAL AND SIGNATURE (NOT SCANNED) WILL GET THE EXEMPTION.

The EMD shall be forfeited:

If the bidder withdraws the bid during the period of bid validity specified in the tender. In case a successful bidder fails to furnish the Performance Bank Guarantee (if applicable).

- e) Undertaking that the successful bidder agrees to give a Performance Bank Guaranty of 10% of the purchase order value in favour of “Director, National Institute of Science Education & Research, Jatni valid till warranty period.

Performance Bank Guarantee:

Within ten (10) days of the award of contract, the vendor shall furnish a Performance Bank Guarantee amounting to 10% of the purchase order value in the form of Bank Guarantee favouring the Director, National Institute of Science Education & Research, Jatni valid till completion of warranty period.

- f) If the bid is for branded makes, authorization letter from principals clearly indicating that the vendor is the competent authority to sell and provide services towards the items mentioned in the scope of supply given in this tender document.
- g) Copy of GST No. and PAN No. allotted by the concerned authorities.
- h) List of deliverables / Bill of materials and services.
- i) Compliance sheet with any deviation with reference to the terms and specifications.
- j) The item should be supplied with manuals and the manuals including technical drawings should be complete in all respects to operate the system without any problem.

“Commercial Bid” shall contain:

- a) Price schedule complete in all respects with proper seal and signature of authorized person.
Tender with any condition including conditional rebate shall be rejected forthwith.
- b) Cost of all the items should be mentioned clearly and individually in the Commercial Offer only.
- c) **The Bidders are requested to quote for Educational/Institutional Price for Machine/ Equipment and, since we are eligible for the same.**
- d) **Printed conditions of the vendor submitted with the tender will not be binding on NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH.**

5. Tender process & award of contract.

The technical bids will be evaluated to shortlist the eligible bidders. The commercial bids of only the short listed bidders shall be considered for further processing. Bidders whose technical offer is

found acceptable and meeting the eligibility requirements as specified in this tender will be informed about the date and time of the opening of the commercial bid.

- NISER will open commercial bids of only the short listed bidders, in the presence of the bidders or their authorized representatives who choose to attend the commercial bid opening. The Date and Time of opening the Commercial Bid will be intimated only to pre-qualified and technically acceptable Bidders for the item at a later date.
 - ONLY TECHNICALLY accepted competitive bids will be considered for placing Purchase Order. The commercial offers of the vendors whose technical offers are found to be technically deficient or do not meet the qualification criteria as specified in this tender will be returned to them without opening.
 - **Purchaser's Right to vary Quantities at the time of Award:** NISER reserves the right at the time of award of Contract to increase or decrease the quantity of items specified in the Schedule of Requirements without any change in price or other terms and conditions.
6. **The Director NISER reserves the right to accept the offer in full or in parts or reject summarily or partly.**

7. Delivery Period / Timeliness

The deliveries, installation must be completed within 180 days, after placement of purchase order. The time is the essence of the contract. It is mandatory for the bidders who respond to this bid to meet these expectations, as they are tightly linked to NISER's plans of completing the project within the time frame.

8. Locations for the Supply / Services

The Laboratory Equipments covered by this document is required to be supplied and installed at School of Physical Sciences of NISER, Jatni.

9. Order Placement and Release of Payment

The Purchase Order and payment shall be processed by –

**Stores & Purchase Officer
National Institute of Science Education & Research,
Jatni Campus, P.O. – Bhimpur-Padanpur, Via-Jatni,
Khurda – 752050, Odisha, INDIA**

Payment for the items to be supplied by the vendor against the purchase order shall be made by National Institute of Science Education & Research as follows:-

100% payment will be made through Letter of Credit. 80% will be paid after submission original shipping documents & balance 20% will be released after satisfactory installation, commissioning, warranty certificate and along with submission of Performance Bank Guarantee.

Agency Commission: Agency Commission to be paid to Indian Agent should be specified separately and same will be paid in INR.

The tenderers who are not agreeing to above payment terms are requested not to submit their tender otherwise their EMD will be forfeited.

10. NISER will not provide any accommodation/transportation for the engineers/ representatives for attending installation, commissioning and demonstration work. It is the absolute responsibility of the Principal Supplier/Indian Agent to make their own arrangements.

11. **The successful bidder**, on award of contract / order, must send the contract / order acceptance in writing, within 7 days of award of contract / order failing which the EMD will be forfeited.

12. Period of validity of bids

- Bids shall be valid for a period of 90 days from the date of opening the Technical bid.
- NISER may ask for the bidder's consent to extend the period of validity. Such request and the response shall be made in writing only. The bidder is free not to accept such request without forfeiting the EMD. A bidder agreeing to the request for extension will not be permitted to modify his bid.
- Bid evaluation will be based on the bid prices without taking into consideration the above corrections.

13. Corrupt or Fraudulent Practices

NISER requires that the bidders who wish to bid for this project have highest standards of ethics. NISER will reject a bid if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices while competing for this contract. NISER may declare a vendor ineligible, either indefinitely or for a stated duration, to be awarded a contract if it at any time determines that the vendor has engaged in corrupt and fraudulent practices during the execution of contract.

14. Interpretation of the clauses in the Tender Document / Contract Document

In case of any ambiguity / dispute in the interpretation of any of the clauses in this Tender Document, Director, NISER's interpretation of the clauses shall be final and binding on all parties.

15. Price

- The price quoted shall be considered firm and no price escalation will be permitted at any time. The quotation should be in Indian Rupees or any known foreign currency. Packing, forwarding, freight, insurance, **Agency commission** and commissioning charges, if any extra may be quoted separately in Commercial Bid.
- In case of INR bids the price criteria should be on F.O.R., NISER, Jatni. Govt. Levies like GST, etc., if any, shall be paid at actual rates applicable on the date of delivery. Rates should be quoted accordingly giving the basic price, GST, etc., if any.
- Please provide TIN no. of the firm along with the GST No. allotted by the concerned authorities in your quotation.
- In case of Foreign Currency bid: - Price criteria should be FOB nearest airport detail break up of Price, FCA cost, **Agency Commission**, Insurance, Freight up to Kolkata Airport is required.
- NISER may place order at CIF Kolkata Airport basis.

16. Pre-installation:

Pre-installation facilities required for installation may please be intimated in the technical bid. Subsequently, before the consignment lands in NISER, Jatni the bidder shall confirm that the pre-installation requirements are sufficient for installation of the equipments. In other words the bidder should continuously monitor the pre-installation requirements and see that everything is ready before the consignment is taken to the site for installation.

17. Installation, Warranty & Support

- Bidder shall be responsible for installation / demonstration wherever applicable and for after sales service during the warranty and thereafter.
- The items covered by the schedule of requirement shall carry minimum Five years comprehensive warranty from the date of acceptance of the equipments by NISER. Warranty shall include free maintenance of the whole equipment supplied including free replacement of parts. The defects, if any, shall be attended to on immediate basis but in no case any defect should prolong for more than 24 hours. The comprehensive warranty includes onsite warranty with parts.
- The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. This includes cost, insurance, freight, custom duty, GST, local taxes if any should be borne by the beneficiary or his agent. A clear confirmation should be given for this item.

- The bidder shall assure the supply of spare parts after warranty is over for maintenance of the equipment supplied if and when required for a period of 10 years from the date of supply of equipment on payment on approved price list basis.
- The equipment must be supported by a Service Centre manned by the principal vendor's technical support engineers. The support through this Centre must be available 24 hours in a day, three days a week and 365 days a year. Also it should be possible to contract the Principal's vendor support Centre on a toll free number/web/mail.
- The vendor will have to arrange for all the testing equipment & tools required for installation, testing & maintenance etc.

18. Indemnity

- The vendor shall indemnify, protect and save NISER against all claims, losses, costs, damages, expenses, action suits and other proceeding, resulting from infringement of any law pertaining to patent, trademarks, copyrights etc. or such other statutory infringements in respect of all the equipment's supplied by him.
- The successful bidder will be fully responsible for payment of wages and other dues as prescribed and compliance of various Labour Laws.
- The successful tenderer should give an undertaking that the staff deployed at the centre in terms of this contract at all time will be employees of the agency exclusively and they shall not be entitled to any claim of employment or permanency of job with NISER.
- NISER reserves the right to forfeit whole or part of the security money towards any damage/lose caused due to the negligence on the part of the agency engaged.

19. Insurance

The equipment to be supplied will be insured by the vendor against all risks of loss or damage from the date of shipment till such time it is delivered at NISER site in case of Rupee/Foreign currency transaction.

20. Penalty for delayed Services / LD

As time is the essence of the contract, Delivery period mentioned in the Purchase Order should be strictly adhered to. Otherwise the EMD/SD will be forfeited and also LD clause will be applicable /enforced.

If the supplier fails to Supply, Install and Commission the equipment as per specifications mentioned in the order within the due date, the Supplier is liable to pay liquidated damages of 1% of order value per every week of delay subject to a maximum of 10% beyond the due date. Such money will be deducted from any amount due or which may become due to the supplier.

NISER reserves the right to cancel the order in case the delay is more than 30 days Penalties, if any, will be deducted from the EMD.

21. Jurisdiction

If a dispute arises out of or in connection with the contract, or in respect of any defined legal relationship associated therewith or derived therefrom, the parties agree to submit that dispute to arbitration under the ICADR Arbitration Rules, 1996.

The authority to appoint the arbitrator(S) shall be the International Centre for alternative dispute resolution.

The International Centre for Alternative Dispute Resolution will provide administrative services in accordance with the ICADR arbitration Rules, 1996.

**Stores & Purchase Officer
NISER, Jatni**

DECLARATION BY THE VENDOR

It is hereby declared that I/We the undersigned, have read and examined all the terms and conditions etc. of the tender document for which I/We have signed and submitted the tender under proper lawful Power of Attorney. It is also certified that all the terms and conditions of the tender document are fully acceptable to me/us and I/We will abide by the conditions from serial no. 1 to 21 and we have not given any printed conditions beyond the scope of this tender. This is also certified that I/We/our principal manufacturing firm have no objection in signing the purchase contract if the opportunity for the supply of the items against this tender is given to me/us.

Date:

Signature:

Address:

Name:

(Company Seal)

Designation:

On behalf of:



PART - 1
FOR SUPPLY AND INSTALLATION OF
HIGH PERFORMANCE COMPUTING CLUSTER
FOR
NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, JATNI
Notice Inviting E-Tender No.37/2017-NC-000456-PHY-17-18 (2 Part Tender)

General Information –Self Attested

1.	Name of the Company	Please fill details	Page No. with name of the documents attached in support of information required
2.	Full address of company along with Telephone no. Fax no. E-mail address :		
3.	Local address of company for communication, if any		
4.	Are you a manufacturer or dealer/reseller		
5.	Annual turnover in last 3 financial years in Rs. Crores. (i) Year 2014-2015 (ii) Year 2015-2016 (iii) Year 2016-2017 Please attach balance sheet		
6.	Supply & Installation of High Performance Computing Cluster or equivalent to our tendered of last 3 financial years in State Government or Govt. of India Department(s) /Reputed Organisation(s) (in Nos. and Value) (Please attach list of clients) (i) Year 2014-2015 (ii) Year 2015-2016 (iii) Year 2016-2017 Please attach copy of Purchase Order/ Completion Certificate		
7.	GST Registration no. with Place		
8.	Income Tax Registration no. with place		
9.	Photocopy of EMD		
10.	If you are claiming exemption certificate under SSI/DGS&D/DAE, Please attach self attested copy of certificate which should be valid during the tender process		
11.	Service centre details & principal vendor support centre		
12.	Declaration to be submitted by Vendor		
13.	Warranty 5 years Accepted/Not Accepted		



**SUPPLY AND INSTALLATION
OF
High Performance Computing (HPC) Cluster
FOR
National Institute of science education and research, JATNI
Notice Inviting E-Tender No. 37/2017 (NC-000456-PHY-17-18)**

TECHNICAL SPECIFICATION

SL. No.	Item Specification	Accepted/Not Accepted/Deviation if any. Please specify your specification if deviation is there	Page No. of your specifications/Brochure/Deviation, etc attached in support of your specification/deviation
<p>NISER is planning to procure a High Performance Computing (HPC) cluster.</p> <p>The technical quote must be accompanied by a detailed technical document of the equipment components quoted from OEMs. Description proving compliance to each of the above technical requirement must be clearly highlighted in the said technical document, and the serial number of the related technical point must be noted next to the highlighting. In case the specific information is not present in the document, it must be clearly mentioned with a web-link, where in the website of the OEM such information about the quoted equipment can be found.</p> <p>Failure to satisfy these conditions, or unavailability of information to prove the technical features, or incomplete or unclear or false information provided in the technical quote will be grounds for summary disqualification. The onus is on the quoting party to provide all the information required for technical assessment, and such assessment will be carried out solely on the basis of the information provided to NISER in the technical quote.</p>			

1	<p>Master Node: (Quantity 1 no.)</p> <p>a) Processor: 2 x Intel® Xeon® Silver 4110 Processor (11M Cache, 2.10 GHz)</p> <p>b) Memory: 2 x 32 GB DDR4 2666 MHz registered ECC memory with 24 DIMM slots</p> <p>c) Hard Disk: 2 x 1 TB hot-plug SATA HDD, 12 Gbps RAID controller with RAID levels 0, 1, 5, 10.</p> <p>d) Power Supply: 1. Power cables should be compatible with the quoted rack PDU. 2. Redundant and hot pluggable power supply.</p> <p>e) Form Factor: 1U rack mount with rail-kit.</p> <p>f) Infiniband Connectivity: Necessary Dual port HBA card for connecting Infiniband switch.</p> <p>g) Gigabit LAN Connectivity: Dual Gigabit Ethernet RJ45 ports</p> <p>h) Optical Drive: Internal 8x DVD RW drive</p> <p>i) Management: IPMI 2.0 with LAN and KVM-over- LAN support</p> <p>j) Expansion Slot: 3 x PCIe 3.0 x16, 1 x PCIe 3.0 x8, all slots integrated on motherboard without the use of riser cards.</p> <p>k) Operating System: Scientific Linux (SLC7)</p> <p>l) KVM Switch & Console: 16-port digital KVM Switch with all cables & adapters, 17” rack console with integrated keyboard & touch-pad.</p> <p>m) Warranty: 5 years on-site comprehensive warranty</p>		
2	<p>Compute Node: (Quantity 4 no.)</p> <p>a) Processor: 2 x Intel® Xeon® Gold 6130 Processor (22M Cache, 2.10 GHz)</p> <p>b) Memory: 4 x 32 GB DDR4 2666 MHz registered ECC memory with 24 DIMM slots</p> <p>c) Hard Disk: 2 x 1 TB hot-plug SATA HDD, 12 Gbps RAID controller with RAID levels 0, 1</p> <p>d) Power Supply: 1. Power cables should be compatible with the quoted rack PDU. 2. Redundant and hot pluggable power supply.</p> <p>e) Form Factor: 1U rack mount with rail-kit.</p> <p>f) Infiniband Connectivity: Necessary Dual port HBA card for connecting Infiniband switch.</p> <p>g) Gigabit LAN Connectivity: Dual Gigabit Ethernet RJ45 ports</p> <p>h) Management: IPMI 2.0 with LAN and KVM-over- LAN support</p> <p>i) Expansion Slot: 3 x PCIe 3.0 x16, 1 x PCIe 3.0 x8, all slots integrated on motherboard without the use of riser cards</p> <p>j) Operating System: Scientific Linux (SLC7)</p> <p>k) Warranty: 5 years on-site comprehensive warranty</p>		

3	<p>Storage:</p> <p>a) Storage Requirement: 60 TB usable capacity using 4 TB NL-SAS / SATA HDD with RAID 6 (6D+2P). Additional 10% capacity using 2 TB NL-SAS / SATA HDD with RAID 10 (2+2).</p> <p>b) Connectivity: FDR 56 Gb/s Infiniband / 16 Gb/s Fiber connectivity between Storage servers to Storage enclosures with Redundant Connects & Links.</p> <p>c) IO Nodes specification: Minimum 2 x IO nodes with same specification as Master Node.</p> <p>d) Parallel File System: Suitable parallel file system either from server & storage OEM or commercially available version</p> <p>e) Benchmark: 1. Open-source IOR/IO Zone benchmarks running on compute nodes with 1 MB block size and file size double than total storage cache and I/O node memory. 2. Storage performance should be measured from client (compute node) using IOR benchmark for 1 GB/s write throughput.</p> <p>f) Warranty: 5 years on-site comprehensive warranty</p>		
4	<p>Infiniband Switch:</p> <p>a) 18 Ports FDR (56Gb/s) Manageable Infiniband switch. (Non-blocking Architecture)</p> <p>b) Warranty: 5 years on-site comprehensive warranty</p>		
5	<p>Ethernet Switch:</p> <p>a) 1 x 24 port Gigabit switch managed</p> <p>b) Warranty: 5 years on-site comprehensive warranty.</p>		
6	<p>Rack:</p> <p>a) 42 U rack with 2 numbers of 32A 3-phase PDU's with necessary MCBs and accessories capable of connecting to the 32A 3-phase industrial socket. Minimum 18 C13 and 5 C19 Sockets per PDU</p> <p>b) Warranty: 5 years on-site comprehensive warranty.</p>		
7	<p>UPS:</p> <p>a) 20KVA 3-phase Online UPS with 0.9 or unity power factor and 30 min. battery backup for full load of UPS</p> <p>b) Warranty: 5 years on-site comprehensive warranty including batteries.</p>		

