BANARAS HINDU UNIVERSITY
COMPUTER CENTRE
VARANASI-221005

TENDER DOCUMENT
FOR
High Performance Computing
QUALITY CUM COST BASIS

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TENDER No. CC/CN/2011/1 **Serial No.**

High Performance Computing At BHU

INDEX

SECTION-1

INSTRUCTION TO TENDERERS

1.1 GENERAL

1.1.1 For and on behalf of the Banaras Hindu University, Varanasi, the undersigned invites tenders for the supply, installation/ extension, commissioning and maintenance of the High Performance Computing (HPC) system.

1.1.2 The tender-sets can be obtained from the office of the Coordinator, Computer Center, BHU, Varanasi from 1100 hrs. to 1600 hrs., on all working days as per the advertisement in national newspaper on payment of Rs. 1000/- (Rupees one thousand only) by bank draft drawn in favour of **The Registrar, B.H.U.,** payable at Varanasi. Tender-sets can also be downloaded from our site www.bhu.ac.in, but such tenders must accompany a draft of **Rs. 1000/-** only drawn in favour of **The Registrar, B.H.U.,** payable at Varanasi, towards tender document fee (tenders shall be rejected without this tender document fee).

1.1.3 Either the photocopy of the receipt of cash deposit or the draft of the appropriate amount must accompany tender sets.

1.1.4 All the documentation should be in English.

1.2 RECEIPT AND OPENING OF TENDERS

1.2.1 **Tenders (in triplicate) based on "Three Envelope System" as stated hereunder, each envelope, sealed independently, along with the relevant schedules and appendices duly filled in, will be received up to 1500 hrs of 4th July, 2011 in the office of the undersigned and will be opened at 1600 hours of the same day in the office of the Coordinator, Computer Center, BHU, Varanasi. The tenderers or their authorized representatives may be present at the time of the opening of the tenders. The tenderers shall inform in writing the names, the designation, relationship and full address of the authorized representatives in a separate envelop submitted with their tenders.**

1.2.1.a **SEALED ENVELOPE – 1**

This shall contain the requisite earnest money deposit as specified in section 1.5. This envelope shall bear the superscription, **"Part-I Earnest Money Deposit – Tender Serial No. "**

1.2.1.b. **SEALED ENVELOPE – II**

This shall contain the "Technical Bid" in triplicate covering the relevant technical information, guaranteed technical particulars, past experience, etc.. and other terms and conditions (both commercial as well as technical) as per the tender specification (except prices of the equipment offered). This envelope shall bear the superscription **"Part-II Technical Bid Tender Serial No. "** Deviations if any, in respect of technical and/or commercial terms of the tender specification, as sought by the tenderers may be submitted along with the "Technical Bid" only. A soft copy of the Technical Bid (ONLY) on CD/DVD, must be enclosed in the sealed envelop.

1.2.1.c. **SEALED ENVELOPE –III**

This shall contain only "Financial Bid" in triplicate strictly in conformity with the format enclosed in the tender specification vide "Schedule of Quantities and Prices as per Schedule-I & II". This envelop shall bear the superscription **"Part-III Financial Bid Tender Serial No. " .**

1.2.2 **Technical clarifications will be sought by B.H.U. from the selected bidders in a post-bid conference (if required by BHU) to be held at 11.00 A.M. on 25th July, 2011 in the office of the Coordinator, Computer Center, BHU, Varanasi.**

1.2.3 Tenderers are, advised to submit the tenders complete in all respects.

1.2.4 **The tenderers whose "Technical Bids" are acceptable to BHU, will be allowed to attend the opening of "Financial bids" scheduled on 5th August 2011, at 3.00 P.M. in the office of the Coordinator, Computer Center, BHU,** Varanasi. Only authorized representatives of such bidders will be allowed to attend the opening of the "Financial Bids".

1.2.5 Earnest Money Deposit of such tenderers, whose technical bids are not acceptable to BHU, will be returned to the respective tenderers. **The decision of BHU shall be final and binding in this regard.**

1.2.6 BHU reserves the right to postpone and/or extend the date of receipt or to withdraw the tender notice without assigning any reason thereof. In such event, tenderers shall not be entitled to any compensation in any form whatsoever.

1.2.7 If the last date of receipt of tenders, as aforesaid falls on a holiday, tenders would be received on the next working day at the same time as specified under Para No. 1.2.1 above.

1.3 PREPARATION OF TENDER:

1.3.1 Tenderers are advised to fill in the ***Schedules I and Schedule II as specified appendices (page aprox. 23, 24)*** in respect of each and every item by strictly following the instructions provided in the tender-sets in order to facilitate speedy evaluation of tenders. BHU reserves the right to reject tenders not following such instructions.

1.3.2 The tenders should be filled in by the tenderer himself/herself or in the event the tender is filled by his authorized signatory, the name and designation of the authorized signatory should be clearly indicated in the tender.

1.3.3 The tenderers in their own interest are advised to be very careful while writing their rates in “Schedule of Quantities & Prices”. The rates should be written very neatly, preferably typed, and there should be no overwriting or corrections.

1.3.4 In case there are some corrections or over-writing, the same should be signed by the tenderer himself/herself or by the person authorized by the tenderer. The tenderers are further advised to quote the rates both in words as well as in figures.

1.3.5 A set of technical, descriptive and illustrative literature/leaflets/brochures/ catalogues should accompany the tender in the technical bid wherever applicable giving cross-reference to the item quoted.

1.3.6 The work covered by this tender specification shall be carried out strictly in accordance with the conditions specified in this tender document. If any of the aforesaid condition is not clear to a tenderer, clarification may be sought from BHU before submission of tenders. Tenderers are advised to accept all the conditions specified in the tender document to facilitate early finalization of tenders. Should the tenderer, however be unable to comply with any of the conditions of the contract as specified in this tender document, he/she shall clearly mention the proposed departure in the relevant schedule.

Separate set of commercial conditions (such as tenderers standard printed conditions) enclosed with the offer and any reference thereto may render the tender liable to summary rejection.

1.4 SUBMISSION OF TENDERS:

1.4.1 All the three sealed envelopes *viz*., "Part-I: Earnest Money Deposit", "Part-II: Technical Bid" and "Part-III: Financial Bid" shall be submitted/mailed in single large package/parcel with **"Tender Serial No. "clearly written on the top, so as to reach the office of the undersigned** on or before the time & date specified under Para 1.2.1.

1.4.2 Tenders shall preferably be mailed by Registered Post. However, in case the tenders are delivered in person, these should be handed over in the office of the undersigned and due acknowledgment receipts be obtained, failing which BHU will not be responsible for any misplacement/loss of tender.

1.4.3 Tenders received either late or after the prescribed due date and time will not be entertained and will be rejected summarily. BHU will not be responsible for any postal delay.

1.4.4 Only detailed and complete tenders that are received by due date and time prescribed for receipt of tenders will be considered. Telegraphic/Fax/ Incomplete tenders shall be liable to rejection.

1.5. EARNEST MONEY

1.5.1 Tenderers shall submit along with the tenders the requisite earnest money of Rs. 1, 00, 000/- (Rs. One Lakh only) in the form of crossed bank draft drawn only in favor of **The Registrar, B.H.U.,** Payable at Varanasi.

1.5.2 Tenders received without requisite earnest money shall be rejected.

1.5.3 The tenderers shall not be entitled to revoke, withdraw or alter their offer or any terms and condition thereof, during the period of validity of their offer, without the written consent of BHU. **The tenderer shall forfeit the earnest money deposited along with the tender if the tender is withdrawn within the validity period without the consent of B.H.U.**

1.5.4 In addition to this, the tenderer may at the discretion of BHU be debarred from tendering for a period as may be considered fit by BHU against any tender that might be invited by BHU in the future. BHU will also be within its rights to circulate the information at its discretion to other prospective

purchasers about the tenderer having withdrawn his offer within the validity period.

1.6 QUALIFICATION OF TENDERERS

1.6.1 **The tenderers should enclose/produce satisfactory evidence that they have necessary experience, financial resources and engineering organization to under- take such work to the satisfaction of BHU. If the tenderer fails to do so, his tender shall be rejected. Tenderer should also fulfill the following criteria:**

1. Vendor must quote for all the requirements together viz. HPC Cluster, Storage, Infiniband, GigE switch, Tape library (to be quoted separately) , and any other special Power and Cooling arrangements required for the proposed solution. Partial response to this tender will be summarily rejected.

2. The bidder must quote all IT Server and Storage products from a single OEM in this proposal. Solutions built with IT hardware from multiple OEM will be rejected.

3. All hardware components must be 19” standard compatible. Additional items necessary for integration into 19” standard cabinets including the necessary PDU, must be supplied. If any special cooling requirements for the rack cabinets must be specified.

4. All equipment must be compatible with Indian electrical standards and codes. Engineering documentation on the physical sizes and weights of all major and minor components must be submitted.

5. All software provided in the proposal should be perpetual.

6. The proposal must include a detailed datasheet for every single IT component included in your proposal and the necessary technical whitepapers discussing the features, performance and optimization techniques.

7. All vendors are required to submit the Technical Documentation (Product Brochures, leaflets, manuals etc.) and proof of compliance along with the bid failing which the bids are liable to be rejected

8. OEM site (India or abroad) training for 5 persons (min.) deputed by BHU should be provided on entire solutions implemented (including OS/ Cluster/ Scheduler/ Parallel file system/ NFS/ user management/ Server

storage management and troubleshooting etc.) along with on site operational training.

9. The envelopes containing Part-I and Part-II should be labelled clearly and kept in a bigger sealed envelope.

10. Warranty & Support: Three years 24 X 7 comprehensive on-site for both Hardware and Software.

11. Vendors are requested to quote separately for five years 24 X 7 comprehensive on-site warranty for both Hardware and Software

12. Delivery period will be 6 weeks from the date of purchase order. Once delivered to onsite, the installation, commissioning and acceptance testing period: Within 4 weeks from the date of supply of equipment.

13. System integrators must submit the OEM's authorization certificate for the quoted products for their firm.

14. The bidder or OEM must have HPC installations in the current list of TOP500.org.

15. The bidder/ OEM should quote all the installation of HPC that they have done in INDIA along with complete address, phone numbers including mobile nos.

16. Bidder should be OEM/Authorized Partner of the OEM and a Letter of Authorization from OEM, specific to the tender should be enclosed.

17. The Bidder should be Authorized Service Provider for the OEM.

18. The firm/company should be ISO 9001 certified (Maintenance & System Integration). Please attach a copy of the certificate.

19. Bidder should be financially sound to execute the order. Certificate to this effect should be issued by any Nationalized/Scheduled bank.

20. The bidder must have experience of executing similar orders. Details & proof of Service facilities for Technical Support on Services be attached.

21. The bidder should have certified engineers from Industry for HPCC stack (e.g. Parallel file system, Infiniband etc.) with minimum 2 engineers. And both of them should be present at the time of Installation.

22. *Must have turnover of more than 5 Crores and positive growth curve for the last 2 years. Company balance sheet to be attached for the last two years.*

1.7 MODIFICATIONS PRIOR TO THE DATE OF TENDER OPENING:

BHU may revise or amend the specifications and other conditions prior to the date notified for receiving the tenders. Such revisions and amendments, if any will be communicated to all the prospective tenderers. In such a case, if considered necessary, the last date and time of receiving and opening of the tenders may also be extended at the discretion of BHU.

1.8.1 DELIVERY OF EQUIPMENT AND COMPLETION OF WORK

The tenderer should enclose with his/her tender a detailed activity (PERT) chart for the pieces of work covered in this specification starting from the date of letter of intent. The target completion date should be Seven weeks from the date of issuance of the letter of intent.

1.9 VALIDITY:

The tenders should remain valid for a period of at least four calendar months, from the date of opening of the tenders.

1.10 AWARD OF CONTRACT:

1.10.1 BHU shall not be bound to accept the lowest or any tender and reserves the right of accepting the whole or a portion of any of the tenders or reject any tender as it may deem fit without assigning any reason thereof.

1.10.2 BHU reserves the right to take over part or full work from the contractor after the award of work or during the execution of work.

1.10.3 Canvassing in any form by the tenderer to influence the consideration of his/her tender shall render the tenderer liable to summary rejection.

1.11 Tender documents are not transferable. The cost of the tender fee is neither Refundable nor adjustable for other tenders.

1.12 Each page of the tender document should be signed in ink and submitted by the tenderer, in token of his/her having studied and understood the tender carefully

1.13 The sealed tenders should be sent to:

The Coordinator
Computer Centre
Banaras Hindu University.
***Varanasi-221005*, UP.**

SECTION – II

SCOPE OF WORK AND GENERAL REQUIREMENTS

2.1 DEFINITION OF TERMS

2.1.1 **BHU** shall mean **Banaras Hindu University** and shall include its legal representatives, successors and assigns.

2.1.2 'VENDOR' shall mean successful bidder whose bid has been accepted in writing by BHU for the award of the work for the installation of "High Performance Computing" *in BHU* premises and shall include its legal representative(s), successor(s), permitted assign(s) and technical personnel deputed to perform the work under work order.

2.2 SCOPE OF THE WORK

Installation of High Performance Computing at BHU should comprise of the following:

(I) Supply, installation, testing, commissioning of HPC and associated hardware/ software.

(II) Supply, Installation, Testing and Commissioning of Application Softwares with manuals/documentation.

(III) Testing, Commissioning, Integration and Certification of the total HPC system.

(IV) Maintenance support for the entire HPC System (including supply/replacements of spares) during the warranty period and, also during post warranty period (if desired by BHU).

Bidder has to quote for total scope of supply and other works. Bidders offering incomplete scope of supply and other works are liable to be rejected.

2.3 GENERAL REQUIREMENTS:

2.3.1 This specification covers the supply, F.O.R delivery at site, installation, testing and commissioning. Active components, software, etc. (Collectively referred as 'EQUIPMENT) and making them fully operational for the intended use and throughput.

2.3.2 The HPC System should allow for upgradation of technology, addition of new servers/ workstations/ clients/switches/hubs and extension in the future.

2.3.3 All the equipment/accessories will be warranted and must operate at or above the guaranteed values with regard to availability.

2.3.4 The equipment proposed to be supplied by the bidders shall be industry proven products and not the R&D models unless specified in the technical specifications. All supplies including cables, networking products, hardware and software shall conform to the requirements of relevant Indian and International standard.

2.3.5 Part/Model no., etc. as used by the manufacturer shall be indicated along with the technical offer.

2.3.6 Technical literature of the components offered and as published by the original manufacturer of the component, shall be submitted along with the offer giving cross-reference of details in the technical bid.

2.3.7 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.

2.3.8 **The vendor shall provide all the required equipment and services whether explicitly mentioned in these specifications or not to fulfill the intent of the specifications and to ensure the completeness, operability and maintainability of the HPC at no extra cost to BHU**.

2.3.9 All the equipments, accessories and cables supplied under this contract shall be in accordance with the latest applicable recommendations, regulations and standards. The bidder shall furnish a complete list of all the standards and codes under which his/her offered equipment and products are designed, manufactured and assembled along with his/her bid.

2.3.10 **The tenderer must include any necessary upgradation of the existing operating system Software to enable management of existing as well as proposed expansions at Computer Center, BHU**.

2.3. SAFETY MEASURE:

All the safety measures should be taken for the protection of cables, machines and devices from lightening and other such sources like Fire/Theft etc. by the Vendor and any loss incurred in the above should be borne by the vendor.

2.4 SITE PREPARATION, SUPERVISION AND INSTALLATION:

2.4.1. The vendor shall be fully responsible for installation and commissioning of the equipment and other related activities such as unpacking, uncrating, inspection, etc. for which BHU shall provide the required space at its premises. The vendor shall have to arrange by himself/herself all the testing equipment and tools required for maintenance and make his/her own transport arrangements.

2.4.2. Installation of the equipment shall be done by the vendor at the exact locations (intimated by BHU).The vendor shall arrange material/manpower required for such installation at his/her cost.

2.4.3. Cost of material/accessories required for the installation of I/O units, cable, conduits, channels, racks, mounting etc. (like clamps, clamping screws, nails etc.) shall be included in the units bid price of wall mounts, cables, conduits, channels, etc.

2.4.4. Selected vendor shall carry out complete installation through competent/trained supervisor and workmen. All the materials shall be handled and installed taking due care to avoid any damage to BHU property and its personnel. Any damage shall be made good without any cost to BHU.

2.5 GUARANTEED PERFORMANCE:

The vendor shall guarantee that equipment to be supplied under these specifications shall work for its intended use(to reflect the performance and throughput as was specified in the technical specification). The vendor shall also guarantee that in case the equipment supplied under the contract fails to provide its intended use, the equipment will be replaced or additional parts should be installed by the vendor without any financial liability on the part of BHU.

2.6 INSPECTION, TESTING AND COMMISSIONING:

2.6.1 On completion of supply of the equipment under this contract, each item of the equipment shall be thoroughly inspected jointly by BHU and the vendor.

2.6.2 On completion of installation, the HPC system, hardware and software items shall be thoroughly inspected jointly by BHU and the vendor for its completeness and correctness at the site of installation for the start of the acceptance test.

2.6.3 All computer servers along with printers and peripherals in Computer Center and campus network will be tested along with this installed HPC system in the campus wide network to confirm the integrated operation of all the items to the desired level of performance.

2.6.4 Hardware/software will be tested for a minimum of 7 days for checking the various features of the software/hardware before BHU issues the certificate of successful commissioning. After BHU has issued, in writing, the commissioning certificate (total acceptance certificate), the computer systems shall be handed over to Computer Center, BHU.

2.7 TAKING OVER:

The HPC system with the devices shall be taken over by BHU from the vendor after the successful completion of site test and commissioning as per technical specification.

2.8 DOCUMENTATION:

Two sets of technical literature of the components offered and as published by the original manufacturer of the component shall be submitted (both as Hard copy and Soft copy on DVD) along with the offer. The documentation in original shall include the necessary operating and technical manuals for all the H/W system/sub systems and software. The extent of the documentation to furnish shall be to the satisfaction of BHU.

2.10 WARRANTY AND CERTIFICATION:

2.10.1 Vendor shall provide warranty for trouble free operation of the HPC and devices for a minimum period of three years and individual components as specified after commissioning and successful testing and taking over. During this period, it will be the responsibility of the vendor to maintain and support the system fully. It is also the responsibility of the vendor to ensure availability of the devices.

Following aspects should be covered through warranty:

- At least 3 year comprehensive warranty on the active components of HPC and any additional charges that will be required for 5 years of comprehensive warranty.

- Testing and replacement of any or all the parts of the machine in case of fault.

2.10.2 The vendor shall provide periodic preventive maintenance during the warranty including periodic inspection. The preventive maintenance schedule recommendation should be furnished along with the offers. During warranty, the vendor shall provide preventive maintenance in consultation with BHU.

2.10.3 Vendor should provide manufacturer's letter for providing full support for repairs/replacement of equipments for at least seven years after the warranty period and Service level agreement with OEM during warranty and AMC.

2.11(a) **COMPLETION OF WORK:**

The HPC system shall be installed and commissioned in full at the site within Seven weeks from the date of issue of the letter of award. The time of Six weeks is essence of the contract.

2.11(b) **PENALTY:**

In case there is a delay in commissioning and handing over of the equipments and breach of any of the conditions of the warranty clause by the vendor, liquidated damages of Rs. 25,000 (Rs. Twenty five thousands only) for each week's or part of week's delay up to first four weeks and thereafter Rs.1.00 Lakhs per week or part of the week's delay will be deducted from the final bill of the tenderer.

2.12 **COMPLETENESS OF OFFER:**

In case any item is not given in the technical specification of this tender, but which is required essentially for commissioning of the project, it should be included in the offer so as to make the offer complete in all respects. No claim for extra payment shall be entertained on the plea that the equipment specification was not complete in all respects.

2.13 **BANK GUARANTEE:**

The successful tenderer shall give a Bank Guarantee for 10% of the contract value or Rs.5.00 Lakhs whichever is less as Security Deposit, at the time of signing of the agreement, for satisfactory execution of the Contract and for defect liability. This Bank Guarantee shall be kept valid till the completion of work, final commissioning and issue of Final Acceptance Certificate and defect liability period. If the successful Tenderer fails to commence the work within the prescribed time specified in the contract for commencement of work, he/she will loose the Security Deposit which will subsequently be claimed by the university through encashment of the Bank Guarantee furnished by him/her earlier. The

University will have full right to invoke the Bank Guarantee if the tenderer commits the breach of the contract.

2.14 DEFECT LIABILITY:

The defect liability period of the work under this contract shall be 12 months from the date of issue of the final acceptance certificate.

2.15 ASSIGNMENT AND SUB-CONTRACT:

The tenderer shall not assign or sublet the whole or any portion of the contract or allow any person to become interested therein in any manner whatsoever without prior written approval of BHU. Provided, that always the provision of labour on a piece of work basis shall not be deemed to be a sub-letting under this clause. The permitted assignment/sub-contracting of work by the contractor shall not establish any contractual relationship between the sub-contractor and BHU and shall not relieve the contractor from any liability or obligations under the contract and tenderer shall be responsible for the acts, default and neglects of any sub-contractor.

2.16 FORCE MAJEURE:

2.16.1 Neither the university nor the tenderer shall be liable to the other for any delay in or failure of, their respective obligations under this agreement caused by occurrence beyond the control of the University or the tenderer because of fire, floods, power, acts of God, lockout, sabotage, any law, statute or ordinance, order, actions or regulations of the Governments or any agency thereof, or any compliance therewith or any other causes, contingencies or circumstances similar to the above. Either party shall promptly, but not latter than 30 days, thereafter notify the other to the commencement and cessation of such contingency and proof that such is beyond the control and affects the implementation of this agreement adversely and mutually. If such contingency continues beyond six months, both parties agree to discuss and agree upon an equitable solution for the termination of this agreement or otherwise decide the course of action to be adopted.

2.16.2 The respective obligation of the parties shall be extended for the period of Force Majeure provided notices as required above are given in time and the contingency established if so required by the other party.

2.17 JURISDICTION:

All questions, disputes and differences arising under and out of, or in connection with the tender/contract, if concluded, shall be referred to the sole arbitration by an arbitrator appointed under the provisions of the Arbitration and Conciliation Act, 1996 by the Vice-Chancellor, B.H.U., Varanasi.

2.18 **TAXES**:

(a**) INCOME TAX:** Income Tax on gross amount billed will be deducted from the contractor's bills as per Section 194 (c) of Income Tax act.

(b) **SERVICE TAX:** Service Tax is payable, if applicable.

(c) **ENTRY TAX:** Entry tax, if applicable, would be paid by the tenderer.

2.19 TERMS OF PAYMENT:

2.19.1 The payments for the part to be imported from foreign country will be paid by BHU through irrevocable Letter of Credit opened in State Bank of India, BHU Branch or through High Sea Sales.

2.19.2 The 80% payment in Indian Rupees for supply can be made through bank after production of proof of dispatch of the items. The remaining 20% will be paid 2 months after installation and successful commissioning of the HPC system.

2.20 SPARE PARTS:

Tenderer should also include, in their tender, provision for spare parts/tools to be supplied with the order for proper maintenance and operation of the network for the specified warranty period and thereafter AMC period, if entered into.

2.21 **APPLICATION TOOLS:**

The tenderer must also supply the diagnostic tools (please mention along with its brochures) for day to day applications without any additional cost to B.H.U.

2.21 VALIDITY OF PRICES:

The rates should be valid for at least six months from the date of issue of the Letter of Intent.

SECTION III

3.3 TECHNICAL PRODUCTS SPECIFICATIONS

3.4 WARRANTY:

Supply and install all the associated equipment specified or required for the successful completion of the above.

3.5. GENERAL TERMS:

(i) All work shall be done in a thorough and conscientious manner according to EIA/TIA guidelines and industry standards, and shall be subject to inspection and acceptance.

(ii) Local regulations or codes shall be followed at all times.

(iii) The contractor shall be certain that all the installation work areas are secure and made safe in accordance with Health and Safety regulations.

(iv) An appropriate construction schedule shall be developed by the contractor and will be subject to approval of the University.

(v) The contractor shall maintain a work area free of debris, rubbish, empty cable reels, scrap wire, etc., and dispose of such items on a daily basis.

(vi) The contractor shall take precautions to avoid damage to the University premises and property, and will perform restoration if any damage occurs.

(vii) The contractor shall provide screws, anchors, clamps, tie wraps, distribution rings, miscellaneous grounding and support hardware, etc. necessary to facilitate the installation of the networking system.

(viii) The contractor shall be responsible for labeling all cables and cords, distribution frames and outlet locations, according to the industry standards. Labels should be Computer generated or typewritten.

(ix) It shall be the responsibility of the installation contractor to furnish any special installation equipment or tools necessary to properly complete the installation.

(x) It shall be the responsibility of the contractor to make an inventory of all the materials upon its arrival at the customer's location and notify the customer of any missing components.

(xi) The contractor shall be responsible for safe custody of the items handed over to him by the University and any loss or wastage shall have to be made good by the contractor at his/her own cost.

(xvii) **INSTALLATION PLAN:**

The contractor/tenderer would provide the installation plan at the time of handing over the same to the University.

SCHEDULE – I

***QUESTIONAIRE*: *Must be* filled in necessarily by the tenderers and cross referencing with support documents and submitted with technical bids.**

1	Have you submitted OEM's authorization?	Yes/No
2	Certificate for your firm	Yes/No
3	How long you are in the HPC business	2 Yrs./3 Yrs./More
4	Have you completed at least 3 such projects	Yes/No
5	What is the turnover of your company for HPC related work for last 2 years	5 Crores /More
6	Do you/your OEM have ISO 9001 certification For quoted product.	Yes/No
7	How many Educational Institution/University HPC Projects have been completed by you? Give details.	
8	Have you submitted the draft for Earnest money	Yes/No
9	Will you be able to provide 24x7 support for the quoted products.	Yes/No
10	For how long you are in this business in Indian market.	…… Years
11	Would your products be integrated with the existing devices in B.H.U. and the servers on the net.	Yes/No
12	(Give page no. in technical bid where integration has been suggested)	
13	Would system Integrator provide the services of a resident OEM certified engineer during warranty and A.M.C.	Yes/No
14	Does system Integrator have Service Level Agreement with OEM during the warranty & A.M.C. period.	Yes/No

15 The project completion period is four months from the date of the issue of the award of the contract else penalty clause is listed in section 2(11b) of tender. Is it agreeable to you? Yes/No

16 Have you submitted documentary proof of features for the quoted items. Yes/No

17Does your proposed HPC solution support upgradeability. Yes/No

18Can you extend warranty for 5 years instead of three year without any additional cost. Yes/No

19Do you agree with payment terms as mentioned in section 2.19 of the tender. Yes/No

SCHEDULE – II

SCHEDULE OF QUANTITIES & PRICES FOR SUPPLIES

SN	Description	UNIT	Quantity	RATE	VALUE
GRAND TOTAL					

TECHNICAL SPECIFICATIONS OF HPC

CLUSTER COMPUTING

Cluster Architecture	Dense compute server configuration based on Blade/Rack** based architecture using 4X QDR Infiniband interconnect or equivalent/better as technology running Linux
Processor Architecture	64-bit Processor from x86 family Intel XEON / AMD*- Opteron family of processor.
Resource Management Nodes/Login Nodes - 2 Units (Rack mountable server 1U or 2U Maximum): It is to be configured with HPC cluster in HA Mode	
Processor Type	2x Intel Xeon Processor / AMD Opteron Processor (same CPU as the compute node proposed)
Cache	Minimum of 12MB L3 Cache required
Processor	Minimum of 8 cores/Processor for Intel Minimum of 12 cores/Processor for AMD
Memory Scalability	Scalable to minimum of 128 GB or more
Memory Size	Minimum 48GB DDR3 ECC Memory expandable to 128 GB or more
Internal Storage	5x300GB 15K RPM hot swap SAS HDD (with RAID 5)
Internal/ External Media Drive	16X max SATA DVD.
I/O Ports	4 x Gigabit Ethernet Ports, and Dual (4X-QDR) Infiniband ports.
Others	Highly Available Cluster configuration.
Master node 2 No with HA configured into it (for NIS/ Cluster management/ Monitoring/ etc.)	
Description	Technical Specification
Processor	2x Intel Xeon Processor / AMD Opteron Processor with minimum 12MB L3 Cache, Minimum of 8 cores/Processor for Intel Minimum of 12 cores/Processor for AMD.
Memory	Minimum of 48 GB Memory (DDR3 ECC) upgradable to 128 GB per node.

Hard Disk	4x300 GB hot swap 15k RPM SAS HDDs with RAID capability. Server should be scalable to minimum 8 HDDs.
I/O Ports	4xGigabit Ethernet Ports, Dual (4X-QDR) Infiniband Ports.
USB	2x USB 2.0/3.0 Ports
PCI-E Slots	3X PCI-Express slots
Power supply	Maximum power consumption when fully populated should be claerly specified . Redundant power supply with Hot-Swap Fan.
Management Port	Remote Management Port
RAID support	Support SAS RAID 0, 1, 5
Others	Other ports as per the requirement of HPC should be supplied. Internal / External DVD Writer, 1U 17" rack mounted TFT Colour Monitor with Keyboard, Mouse.
Form Factor	1U/2U Rack model with Rail kit

HPC Nodes:	Dense Compute server configuration based on blade/rack form factor and should have at least 5 teraflops with 80% LINPACK efficiency excluding the master node & login node.
Description	Technical Specification
Processor	2x Intel Xeon Processor / AMD Opteron, with minimum 12MB L3 Cache and Minimum of 8 cores/Processor for Intel Minimum of 12 cores/Processor for AMD.
Memory	Minimum of 48 GB DDR3 ECC Memory upgradeable to 128 GB
Hard Disk	160GB SATA HDD.
NIC	2x Gigabit Ethernet Ports and (4X-QDR) Infini band port.
USB	2x USB 2.0\3.0 Ports
PCI-E Slots	1 PCI-E slot

Power supply	Maximum power consumption per node when fully populated should be clearly specified. Configured with hot swap with redundant power supply
Management Port	10/100 /1000 Ethernet Remote Management Port.
Others	Other ports as per the requirement of HPC should be supplied
Operating System	64 bit LINUX Operating System (RHEL/SUSE) with unlimited users. It should be capable to support Windows OS also.
Server Management Software	Integrated Lights-Out Manager (ILOM) or equivalent. Service processor with GUI, SNMP based Manager.

MDS and OSS Nodes : total minimum 4 nos. (Rack mountable server 1U or 2U Maximum): It is to be configured with HA Mode		
Processor Type	2x Intel Xeon Processor / AMD Processor	
Cache	Minimum of 12MB L3 Cache required	
Processor	Minimum of 8 cores/Processor for Intel Minimum of 12 cores/Processor for AMD	
Memory Scalability	Scalable to minimum of 128 GB or more	
Memory Size	Minimum of 48GB DDR3 ECC Memory	
Internal Storage	5x600GB 15K RPM hot swap SAS HDD (with RAID 5)	
Internal Media Drive	16X max SATA DVD	
I/O Ports	4 x Gigabit Ethernet Ports, and Dual (4X-QDR) Infiniband ports.	
Others	Highly Available Cluster configuration.	
Storage System		

Network Attached Storage (NFS server)	• 10 TB usable capacity network attached storage to be configured for NFS services to all the proposed servers. • Storage NAS head/server must be adequately configured to sustain a performance of 500 MB/sec. • Storage NAS head/server must transfer data over the Infiniband QDR fabric. • RAID-6 based configuration is required. Only 600GB 15000 RPM SAS based disks are allowed. • The NAS head/server must be connected to dual redundant array controller based dedicated storage configured with adequate SAS disks. • Vendor should Quote 2 additional HDD as spare apart from RAID-6 config • Solution should based on Red Hat GFS/Ext3 Software • Host Interface for Storage Box shall be FC with Redundant Connects & Links.
High Performance Parallel Filesystem based Storage	▪ 80 TB usable capacity Parallel filesystem based high performance storage services to be available to all the proposed servers. ▪ Parallel File System must transfer I/O data over Infiniband QDR fabric using low latency protocols. ▪ PFS must deliver a sustained aggregate performance of 2 Gigabyte/sec when simultaneous Read and Write operations at 50%:50% are applied using standard I/O performance benchmarks like IOzone or IOR. ▪ Solution shall be sized in such a way that addition of any capacity shall not warrant any additional license. ▪ Adding Nodes in the cluster shall increase the performance of NAS subsystem linearly by extending the file system to additional nodes in load balancing fashion ▪ Solution should be based on Lustre Open Source Software ▪ Host Interface for Storage Box shall be FC with Redundant Connects & Links.

Tape library	▪	40TB of Tape library with backup software ▪ Vendor has to take backup of NFS storage only (/home directory) ▪ Driver technology should be LTO-5 ▪ Number of drivers should be min 4 ▪ Max capacity 144TB, 2:1 compression ▪ Should be FC connectivity

Backup Server for NAS Backup	
Description	Technical Specification
Processor	1 x Intel Xeon Processor / AMD Opteron Processor with minimum 12MB L3 Cache, Minimum of 8 cores/Processor for Intel Minimum of 12 cores/Processor for AMD.
Memory	12 GB Memory (DDR3 ECC) upgradable to 128 GB
Hard Disk	2x146 GB hot swap 15k RPM SAS HDDs with RAID capability. Server should be scalable to minimum 8 HDDs.
I/O Ports	2xGigabit Ethernet Ports
USB	2x USB 2.0/3.0 Ports
PCI-E Slots	3X PCI-Express slots
Power supply	Maximum power consumption when fully populated should be clearly specified . Redundant power supply with Hot-Swap Fan.
Management Port	Remote Management Port
RAID support	Support SAS RAID 0, 1
Others	Other ports as per the requirement of HPC should be supplied. Internal / External DVD Writer, 1U 17” rack mounted TFT Colour Monitor with Keyboard, Mouse.
Form Factor	1U/2U Rack model with Rail kit

Technical Benchmarks
▪ LINPACK ratings (peak & sustained) for entire cluster configuration must be provided. At least 80% efficiency should be sustained in the offered solution and SLALOM benchmarks for scalability.

Racks and Switches	
Cluster InterConnect Network	▪ Infiniband 4X QDR speed Interconnect Fabric. Fully 100% non-blocking and standard fat-tree topology based. Should have min 36 ports usable ▪ Compatible with the latest OFED drivers and OpenMPI libraries. ▪ Should be connected to all the Infiniband ports in all the proposed servers and storage. ▪ Only Infiniband QDR speed Optical cables to be proposed
Cluster Administration Network	▪ 1 Gbps Ethernet based cluster administration network. ▪ Total of 1*48 port switches with 2*10G ports as uplink ▪ Gigabit Switches and suitable cables (CAT6) as required for the proposed HPC systems
Cluster management network (IPMI)	▪ 48 port 10/100MB/s for IPMI network communication with suitable number of CAT6 cables

Racks and onsite integration	▪ 42U OEM Racks with adequate rack accessories and PDU. ▪ Neatly structured cabling for all the power and networked connectivity. ▪ 1U Rack-mounted TFT Monitor/Keyboard/Mouse along with IPMI to monitor all the rack-servers in the proposal. Should be integrated at Customer location in front of customer only including all the components (this will insure that customer learns the whole cluster building process and will also have hold on the cluster management) At customer location, a 48-hour diagnostic/burn-in testing to be done in the presence of BHU constituted committee members. ▪ Successful completion of high performance linpack-parallel carried out at the factory with at least 80% sustained performance to the peak
Clustering Software Suite	▪ Should Provide Cluster Management Software with Job scheduler (Preferably PBS pro)
Graphic Processing	Min. 2 slots of GPGPU cards to be installed for HPC system
	Source of any software, if not from open source should be clearly specified.
Operating System	▪ Latest version of Complete Red Hat enterprise Linux to be supplied with 3 years of patch management and upgrade

** Please Quote separately for blade and (or) rack configuration .
*- Please Quote separately for XEON and (or) AMD processors.