

College of Engineering Trivandrum, Thiruvananthapuram**NOTICE INVITING TENDER**

Tender No. E-Tender ID	:15/P5/HPC/CET/2023 :2023_DTE_550372_1
Description	:Establishing High Performance Computing Centre in College of Engineering, Thiruvananthapuram
Superscription	:Establishing Highe Performance Computing Centre in College of Engineering, Thiruvananthapuram
Last date and time of receipt of tender on the website (www.etenders.kerala.gov.in)	:20/04/2023, 3 PM
Place, Date and time of opening of tender	: College of Engineering Trivandrum, Thiruvananthapuram, 24/04/2023, 11 AM
Date upto which the rates are to be firm	: 30/10/2023
Bidding fee	: ₹29,500/-(Rs.25,000/-+18%GST)
EMD required	: ₹267,000/-
Pre - bid meeting date	:30/01/2023, 11 am
Address of the Officer to whom hard copy is to be send.	: THE PRINCIPAL, COLLEGE OF ENGINEERING TRIVANDRUM, THIRUVANANTHAPURAM-695016, KERALA

College of Engineering Trivandrum, Thiruvananthapuram invites tenders from experienced firms/experienced suppliers/OEM for the above requirement with 5 years warranty. Those who are able to quote in accordance with our requirements, may please furnish their offer in the prescribed format to this tender document and submit online the same with payment of the price noted in the tender notice on or before the last date and time specified in the tender. It should be addressed to the Principal, College of Engineering Trivandrum, Sreekaryam, Thiruvananthapuram-695016. Late and delayed tender and those submitted through fax and e-mail will not be considered. The tender documents duly completed in all respect should be submitted online latest by 20/04/2023, 3 PM

I General conditions

1. The price quoted for supply should be inclusive of all taxes, freight charges, unloading charges, installation and commissioning charges and should be furnished unambiguously. (Tax relaxation, if there is any, will be applicable to this procurement)
2. Payment: 100 % after successful supply, installation, commissioning and demonstration.
3. Delivery Period: Maximum Delivery period will be 90 days from the date of receipt of supply order.
4. Preliminary agreement (in the format prescribed in Annexure 2 of the Kerala Store

Purchase Manual as per GO.(P) 3/2013/SPD, dated:21/06/2013) in ₹220/- Stamp Paper bought from Kerala and tender form should be uploaded.

5. 5% security deposit along with Agreement (As stipulated in the Annexure 23 of the Store Purchase Manual as per GO.(P) 3/2013/SPD, dated:21/06/2013) should be furnished within a month/fortnight from the date of receipt of Supply Order.

6. Date of opening of tender: In case the proposed date declared as holiday, the tender will be opened on the next working day.

7. Only GST registered firms can participate in the Tender

8. If claiming any exemption such as EMD,tender cost,etc.,copies of necessary order exempting the bidder should be forwarded otherwise the tender cannot be accepted.

9. Claim of change in registration of the firm after participating in tender process cannot be accepted.

NB: The Tender procedure will be made as per Rules mentioned in the Revised Store Purchase Manual as per GOP No.3/2013/SPD, dated: 21/06/2013 and the subsequent amendments, additions etc.

The bidders should participate this tender through E-Tendering System. Tender cost and EMD should be submitted only through online. For more details Contact Ph.0471 2577088, 0471 2577188, 0471 2577388, 0471 2515505

II. Eligibility Criteria for Bidder

1. The bidder eligible for participating in the bidding process shall be any one of the following category.

i) Private Ltd /Public Ltd/Registered Firm/OEM

ii) In case of Consortium Maximum number of members including lead bidder shall be not more than two

2. The Bidder/any one member of the consortium should be OEM or Authorized Dealer/Distributor/System Integrator/ Company/Firm of the OEM of the offered product. (Bidder should submit Manufacturer's Authorization letter, in original, on the OEM's letter head duly signed by authorized signatory)

3. In the case of consortium the member of the consortium shall nominate one member as lead member.

4. Proposed bidder should have minimum 5 installation with similar system for Deep learning & Machine learning in different institutes (preferably in Govt. of India Labs, IITs, IISc etc)

5. The bidder should provide necessary proof for establishing his claim of experience.

6. Any Government / Government agency / Banks / Financial Institutions in India should not have blacklisted the Bidder during the last 3 years. Self-declaration to that effect should be submitted along with the Technical Bid.

7. Bidder shall have a direct purchase and support agreement with the OEM. The bidder should submit valid letter from the OEM (whose products are being quoted) confirming the following:

a. Authorization for bidder

b. Confirm that the products/technologies/services quoted are not end-of life. (Please attach the document for the same)

c. Warranty as mentioned in the Special conditions

8. The Bidder is required to quote for the complete BOQ. Partial quotes are liable to be rejected. The evaluation of the Financial Bid will be based on the amount quoted for the whole items altogether.

9. The firm must possess valid GST Tax Registration Certificate & Income Tax / PAN number. (Copies of all the above certificates should be submitted along with the Tender).

10. The Income Tax Return and GST refund document for immediate last two years should be attached.

11. The bidding firm must have made profits as per the balance sheets in the last 3

financial years and should be in sound financial position. Bidder should be OEM or Authorized Dealer/Distributor/System Integrator/Company/Firm of the OEM. In case of Authorized business partner, an authorization letter from OEM must be submitted. In case bidder is sourcing items from other manufacturers, an authorization letter for supply and servicing the same assuring full guarantee and warranty obligations shall be obtained from the principal supplier/ manufacturer.

Note: Bidder must provide necessary supporting documents as proof in respect of the eligibility criteria mentioned above.

III. Special Conditions:

1. Tenders shall be made in ENGLISH with price for delivery, installation and commissioning at College of Engineering Trivandrum, Thiruvananthapuram. The bidder shall express the price in Indian Rupee only (INR). Prices/quotations in currencies other than INR shall be summarily rejected.
2. The price quoted should be firm and quotation has to be valid for a period of 120 days from the date of opening of tender.
3. The bidder has to provide the complete part number wise Bill of Material which will be cross verified with the OEM.
4. The items supplied against the tender must strictly confirm to the specifications as prescribed in tender. If there is any variation in the specification of the product supplied the same has to be replaced.
5. College of Engineering Trivandrum, Thiruvananthapuram has the right to make any changes in the requirements or to change any specifications, at any time. The same will be published as corrigendum.
6. The assurance of quality, time bound supply, delivery and installation of the products/execution of works at customer site will be the sole responsibility of the bidder and they should ensure the same.
7. The Successful bidder on award of Purchase order based on the tender, has to return a copy of the same to College of Engineering Trivandrum, Thiruvananthapuram duly signed and sealed as token of acceptance.
8. Transporting of materials to the site will be the responsibility of the supplier and hence the prices shall be inclusive of transportation charges including loading and unloading.
9. The assurance of quality, time bound delivery, supply and installation of the products/execution of works at customer site will be the sole responsibility of the bidder and they should ensure the same.
10. The successful tenderer shall submit the agreement in stamp paper and within the period specified in the letter of acceptance of his tender/supply order.
11. If the bidder fails to honor the Purchase/Work Order or fails to deliver the products/execution of works in time, the College of Engineering Trivandrum, Thiruvananthapuram will make its own arrangement for supplying the products/execution of works at the cost of the bidder. If the Institution incurs any loss in this account, the amount will be recovered from the bidder.
12. College of Engineering Trivandrum, Thiruvananthapuram or the ultimate customer will be doing final inspection for product/work supplied/delivered and shall reject the material at the cost of supplier in case of quality/specification complaint. The rejected goods are to be removed from supply point at the expense of supplier and materials should be replaced within the time limit as intimated by College of Engineering Trivandrum, Thiruvananthapuram
13. The College of Engineering Trivandrum, Thiruvananthapuram will in no way indemnify the bidder against any eventualities arising out of low quality of products/work/service and punishments by legal/statutory authorities due to negligence, willful act on the part of the bidder or his representative engaged by the bidder. All such issues are to be solved by the bidder at his own risk.
14. If any of the facilities provided by the bidder is found unacceptable, the College of Engineering Trivandrum, Thiruvananthapuram, has the complete right to reject the facilities without giving any compensation.

15. College of Engineering Trivandrum, Thiruvananthapuram has the right to cancel the Purchase/work order at any time without assigning any reason.
16. College of Engineering Trivandrum, Thiruvananthapuram has the right to disqualify any vendor if they fail to provide the necessary clarifications or documents.
17. The evaluation will be done on the total bid value of the opted solution. The bidder is required to quote for all the items of the BOQ. Partial bid is liable to be rejected.
18. The Bidder should provide 5 years on site warranty for the HPC Servers & Accessory items and 24 months on site warranty for batteries supplied from the date of installation. This would include replacement of all spares.
19. The intended bidders can verify the proposed site and building (College of Engineering Trivandrum, Thiruvananthapuram) between 9.00 am and 4.00 pm on all working days till the last date of submission of tender.
20. A pre- bid conference will be convened on 30/01/2023 at 11 am at Pricipal's Conference hall of CET for clearing doubts/clarifications on specifications, attached technical details etc for information of the interested tenderers.

**Sd/-
PRINCIPAL**

Approval Valid

Digitally Approved By
Dr Suresh Babu V *
Date: 19.01.2023
Reason: Approved

The document is digitally approved. Hence signature is not needed.

Items with Specifications

NVIDIA DGX A100 – 640GB (8 x 80 GB GPUs) Specifications

Components	NVIDIA DGX A100 – 640GB (8 x 80 GB GPUs) Specifications
Processors & performance (per node, minimum)	Dual ROME AMD processor with total of 128 CPU cores with minimum 2.25Ghz, with 8 x Nvidia A100 GPU Accelerators; Minimum of 160Tflops peak performance double precision. GPU topology to CPU should be 4:1 (4GPU connected to 1CPU)
Number of GPUs and GPU Communication	8 x Nvidia A100 GPUs with 80GB RAM, NVLink 3.0/ configured or NV Switch with minimum 600GB/s bidirectional communication bandwidth
Performance	160TF Double precision Performance, 5 PetaFlops AI performance 10 PetaOPS INT8
Multi Instance GPU	Single GPU can be partitioned into as many as 7 GPU instances
Internal switches	6 internal NV-Switches for GPU connectivity
System Memory	Minimum 1TB DDR4, 3200 Mhz RAM / Upgradable to 2TB
GPU Memory	Minimum 80GB per GPU, 640GB Per node minimum, with 1.6TB/sec of memory bandwidth
CUDA Cores	Minimum 5000 or above, per GPU
Tensor Cores	Minimum 400 or above per GPU
Network	Minimum 8 x Single port Mellanox connectXIB HDR Ports (200Gbps) Minimum 2 x Dual port Mellanox ConnectX-6(10/25/50/100/200Gb/sec Ethernet) for storage connectivity
Internal Storage	OS - Minimum 2 X 1.92 TB NVMe RAID 1 Internal storage - Minimum 8 x 3.84 TB NVMe
Security Features	The platform should support <ul style="list-style-type: none"> • Trusted platform module for secure cryptographic key generation • Self-encrypting drives for enhanced data at rest security • Secure Firmware Updates for GPU, CPU and BMC
Power requirements	6.5 KW or less; hot plug & redundant power
Rack space	6U or less
System Network (IPMI)	1Gbps network
OS Support	Red Hat Enterprise Linux /CentOS/ Ubuntu Linux. Quoted OS should be under Enterprise support from OEM.

<p>AI, HPC Software Containers and Required DL SDKs with Support</p>	<p>Nvidia NGC (Nvidia GPU Cloud) containers with Nvidia NGC support for 5 years for each system with unlimited user access. Proposed system should be NGC certified system.</p> <p>SDK/library/containers that need to be in the system are: CUDA toolkit, CUDA tuned Neural Network (cuDNN) Primitives TensorRT Inference Engine CUDA tuned BLAS (cuBLAS) CUDA tuned Sparse Matrix Operations (cuSPARSE) Multi-GPU Communications (NCCL) Industry SDKs – NVIDIA DeepStream, ISAAC, DRIVE, Nemo, Jarvis</p>
<p>Preinstalled AI frameworks</p>	<p>Installed optimized AI frameworks like Caffe, CNTK, Tensorflow, Theano, Torch with Docker containers for deploying Deep learning frameworks.</p> <p>Pre-installed Deep learning GPU Training System for to train highly accurate deep neural network (DNNs) for image classification, segmentation, and object detection tasks.</p>
<p>Scalability & Cluster software</p>	<p>System should be scalable with multi node cluster. Software support & cluster tools to be supplied along with product. Full-stack reference designs with all of the leading Storage providers.</p>
<p>Warranty & Support</p>	<p>5 Years onsite warranty, including all spare parts, software stack and DL frameworks.</p> <p>Training should be provided at the site on system configuration, running benchmarks etc.</p>
<p>Qualifying Credential</p>	<p>The quoted GPU Card & the quoted Server should be of the same OEM</p>
<p>HPL & MLCommons Benchmark</p>	<p>Bidder to demonstrate minimum of 65% of HPL DP performance during installation & acceptance. Bidder to perform given MLPerf benchmark in RFP to reproduce during installation.</p>
<p>The Hardware must be listed under MLCommons Training (1.1) for the mentioned Benchmarks, Supporting published link to be shared</p>	<p>Benchmark : Object detection, light weight Data set : Coco Time (in Min) : 9</p> <p>Benchmark: NLP Dataset: Wikipedia Time (in Min) : 21</p> <p>Benchmark: Speech Recognition Dataset: Librispeech Time (in Min) : 35</p>

Benchmark: Reinforcement Learning

Dataset: Go

Time (in Min) : 265

Technical T&C and compliance to be submitted:

- The solution given for ML/DL workload should be certified by the respective OEM vendor to act as verified, tightly coupled architecture. Public document for the same should be available. All the supporting document for the same should be submitted along with bid.
- The solution should have ready to use container for different Big-data, ML, DL stack optimized for given architecture and configured to utilize GPUs fully.
- The solution should be supported for 5 years including all spare parts, software stack, DL frameworks and contract for the same should be with OEM directly.
- During the warranty all the updates and upgrades for software should be given for free.
- Proposed bidder should have min. 5 installation with similar system for Deep learning & Machine learning in different institutes (preferably in Gov. of India Labs, IITs, IISc etc.)
- Bidder must support in initial project once annotated data is available with lab in choosing the right model and train the model using popular opensource frameworks.
- Bidder has to provide 2 days training on system administration, Deep learning & Machine learning, Frameworks, Practicals with few popular modules & Inferencing.

Bidder should submit MAF (Manufacture s Authorization Form) from Nvidia.

IT Rack and Cooling System Specifications

S. No	IT Rack and Cooling System Specifications
1	Specification
1.1	Rack Mounted Active Cooling (7 KW) UPS Rating : 10 KVA x 2 Nos Backup : 30 minutes backup on each UPS on full load Aux : Redundant PDU, fire detection, fire alarm system, remote temperature/humidity monitoring
1.2	Modular and scalable design for power and cooling: All the components used to design the system should be redundant and in the events of failure the components can be maintained easily. All the components of the infrastructure should be such that it can be easily dismantled and relocated to different location.
2	Requirements
2.1	Intelligent Integrated Infrastructure with inbuilt hot and cold aisle containment of 1 racks should cater IT load up to 7 KW

2.2	Intelligent Integrated Infrastructure essentially should include internal redundant or backup power supplies, environmental controls (Rack Based air conditioning, fire detection, Water leak detection and humidity sensors), and security devices. Environmental monitoring shall be done from IP based software.
2.3	Rack based Air Cooling should be of 7 kW capacity - High sensible cooling unit with 100% duty cycle, Split indoor & Outdoor unit design, Scroll compressor for high reliability, Electronically commutated centrifugal evaporator fan for high energy efficiency
3	Access Control - Biometric access control system provided should be controlled by access control panel
4	Power Distribution
4.1	1. 2 x 10 KVA – rack mount UPS with P.F. up to 0.8 & efficiency up to 91%. 30 minutes backup on each UPS at full load.
4.2	Rack PDU 32 Amps (Vertical) - with sockets (12 IEC C13 & 4 IEC C19)-02 Nos
5	Main Electrical Panel and Cabling
5.1	DB panel should be mounted on to utility rack only with all internal cabling integrated into the same.
6	Fire Detection
6.1	Fire detection : Fire detection system should be mounted in panel adjacent to Smart Racks to avoid consumption of any usable U space in In-rack built-in feature of solution. It should have Fire alarm as per NFPA 2001 guidelines. Blanking Panel: 70%
7	Environmental Controls
7.1	Each set of intelligent rack should include basic environmental controls: <ul style="list-style-type: none"> • Smoke Detector • Water Leak Detection system • Temperature/ Humidity Sensor • Door Sensor • Alarm beacon
8	Racks
8.1	42 U racks of dimension 800 mm x 1100 mm, 01 numbers
9	Monitoring
9.1	The integrated racks should have IP based monitoring facility of all the passive parameters inside racks and capable for email alerts
10	Other features:
10.1	*The Intelligent integrated infrastructure would provide all Critical Components like Cooling, UPS, PDU and remote Monitoring from Single OEM. * Single Window remote Monitoring should be available including Cooling Unit.
11	Testing and Commissioning
	1. Under supervision of manufacturer's representative all system functions, operations, protective features shall be checked & pre-set to ensure compliance or specifications.

11.1	<ol style="list-style-type: none">2. Test the system as per recommendations & test listed below using pre-calibrated instruments.3. Simulation of malfunctions to verify protective device operations.4. Duration of supply on emergency. Low battery voltage alarm & shutdown, transfer & restoration of normal supply.5. Remote status & alarm tests.6. In case of any shortfalls / faults, seen during test the same shall be rectified & test procedure shall be again repeated to establish satisfactory performance.
12	Maintenance and Support
12.1	<ul style="list-style-type: none">• Service shall be guaranteed by supplier during defect liability period / guarantee period.• Product OEM shall offer the Data Centre with 24 x 7 services through their authorized service engineer for a period of at least 5 years.• Product OEM shall provide ON SITE warranty for 5 years from the date of taking over of the equipment after the acceptance tests.• The batteries must carry ON SITE warranty for minimum period of 24 months from the date of installation.