

Tender No.CNS/IISC/JTTO/HPCS/07/2019 - Tender for Supply, Installation and Deployment of Computing cluster and Storage system with Scalable Architecture suitable for high performance computing			
The following clarification are provided based on the query raised in the Pre-bid meeting. The modified Tender document is given after the clarification.			
Sl. No.	Section No	Original RFP Specification	Modified RFP Specification
1	1	Last Date & Time for submission of tender : 22nd April 2019 by 3:00pm and Date and time of opening of Technical Bid (Part A) : 23rd April 2019 by 3:00pm	Last Date & Time for submission of tender : 29th April 2019 by 3:00pm and Date and time of opening of Technical Bid (Part A) : 29th April 2019 by 3:30pm
2	2(2.1)	–	The primary bidder is the one who responds to this tender and the order will be placed on them. The primary bidder, henceforth referred to as the bidder, may be an OEM of HPC and/ or Storage system or a reputed System Integrator (SI) with proven track record for HPC with storage systems installation and maintenance. <b>(Bidder / OEM now has been clarified in Section-2 in a manner that it takes care of all the alternatives and self-explanatory)</b>
3	2(4)	Bidder should have minimum annual sales turnover of Rs. 10 Cr. for each of last three financial years (Annexure - II)	Bidder should have minimum annual sales turnover of Rs. 10 Cr. for each of last three financial years (Annexure - II). Benefits available to MSME as given by Government of India will be considered. Please provide appropriate documents.
4	2(5)	The bidders should have set up at least 3 or more high performance compute cluster above or equal to 20 TFlops and/or 1 PB storage systems with similar or better throughput, anywhere in the world. Reference and purchase order copies of previous installations are required (Annexure - III).	The bidder should have implemented at least 3 or more high performance compute cluster above or equal to 20 TFlops and 1 PB storage systems with similar or better throughput, anywhere in the world. Reference and purchase order copies of previous installations are required (Annexure - III). If the bidder happens to be a SI, then either the bidder or the OEM should meet the above condition; the bid should include the authorization letters from the OEM. The technical bid should clearly demarcate the responsibilities between the bidder and the OEM. Complete details of the same have to be submitted with the bid.
5	2(5.1)	–	The successful bidder, during the contractual period, has to address the complete requirement of supply, installation, commissioning, integration as well as warranty and AMC services after the satisfactory acceptance of the solution by the Purchaser.
6	2(5.2)	–	The solution quoted by the bidder for meeting the above stated requirement may require best in class point products/systems from multiple OEMs in order to ensure that all the stipulated requirements are met and the solution is optimal and cost-effective. Therefore the integration and interfacing required across the proposed products is the responsibility of the bidder and should be appropriately achieved to meet the overall requirement.
7	2(6)	–	If the bidder is an SI, then the bidder should have at least 5 (five) years' experience in supply, installation, and deployment of scalable compute cluster and storage system for high performance computing to Central/State Govt. Departments/ PSUs/Banks/Academic and research Institutions/reputed organizations <b>(Self declaration Annexure - IV)</b>
8	2(13.1)	Installation, Commissioning and integration of compute cluster and storage system at IISc	Installation, Commissioning and integration of compute cluster and storage system at IISc by bidder.
9	2(15)	Delivery and Installation at IISc, Bangalore within 45 days from the date of issue of purchase order.	Delivery and Installation at IISc, Bangalore within 6-8 Weeks from the date of issue of purchase order.
<b>The same changes as mentioned in Section 4 -Technical specifications has been incorporated in Section 5 (Part-A) Annexure - VII (Technical Bid) and Section 5: (Part – B) Commercial Bid. Please refer the modified tender document attached.</b>			

10	4	The essential specifications are 1024 compute cores in the computing cluster suitable for high performance computing and a separate 2PB usable storage system. Both should be scalable in architecture. The maximum scalability should be at least 4000 cores for the computing cluster and 10 PB for the storage system. Vendor should inform about the maximum storage and compute cores possible for expansion in the architecture.	The essential specifications are 1024 compute cores in the computing cluster suitable for high performance computing and a separate 2PB usable storage system with required hardware infrastructure for scalability up to usable 10 PB storage solution. Both should be scalable in architecture. The maximum scalability should be at least 4000 cores for the computing cluster and 10 PB for the storage system. Bidder should inform about the maximum storage and compute cores possible for expansion in the architecture.
11	4(1) Part-A	2 X Tesla v100 GPU cards or equivalent with minimum 16 GB RAM and each with support for deep learning software (please list compatible softwares, dev tools and extent of support).	2 X 16GB Tesla v100 GPU cards or equivalent in One of the compute node with NVLink communication and support for deep learning software (please list compatible softwares, dev tools and extent of support).
12	4(4) Part-A	Minimum 128 GB RAM per node	Minimum 192GB memory in balanced configuration
13	4(6) Part-A	–	One Master Node and One Login Node with same specifications : Minimum Intel Xeon Gold Processors with at least 22 MB cache and minimum clock speed of 2.6 GHz or more is required. This node should have minimum 32 cores. Dual-socket type; the model should be specified. Minimum 192GB DDR4 memory in balanced configuration is required. SSD for OS 2 x 480GB with mirroring is required. Minimum 4 x 4000GB, 7200 RPM, Enterprise HDD(s) is required. Minimum 12Gb/s Eight-Port SAS Internal RAID Adapter with RAID 0, 1, 5, 6, 10, 50 and 60 should be supported. Network connectivity compatibility of at least 1GbE and 100Gb/s should be supported. Management LAN and KVM over LAN is required.
14	4(7) Part-A	InfiniBand Switch should be of minimum 100Gbps speed and the appropriate connectors should be provided for the mentioned Switch.	InfiniBand/ OPA Switch should be of minimum 100Gbps speed and the appropriate connectors should be provided for the mentioned Switch. Bidder should quote for appropriate numbers of GigE Switches for secondary connectivity.
15	4(9.1)	2PB usable storage capacity using NLSAS/SATA enterprise grade hard disks. The storage should support 0, 1, 5, 6 and 10 Hardware RAID levels.	2PB usable storage capacity using NL-SAS enterprise grade hard disks. The storage should support 0, 1, 5, 6 and 10 Hardware RAID levels. Fast rebuilds: Storage must offer fast rebuild capability for replacing failed drives. Bidders must demonstrate rebuilding 4TB or higher capacity drive in less than 10 hours.
16	4(9.3)	–	The entire storage solution should be scalable to usable 10 PB in future, with seamless integration. Bidder should quote for 2 PB with required hardware infrastructure for scalability up to usable 10 PB storage solution.
17	4(9.4)	Dual active storage controller with automated I/O path failover - active redundant hardware RAID controller. Specifications for the storage controller and the hardware RAID controller should be specified in the bid.	Storage solution with automated I/O path failover - active redundant hardware RAID controller while maintaining read/write throughput as mentioned below is to be quoted. Specifications for the hardware RAID controller should be specified in the bid.
18	4(9.5)	Storage Controller should support connectivity of at least 100Gbps (a high bandwidth, low latency network of switches) to connect to all compute nodes directly.	Storage solution should effectively connect to compute by minimum 100 Gbps (a high bandwidth, low latency network of switches) to connect to all compute nodes directly.

19	4(9.6)	The overall storage system should be able to deliver at least (i) 30 GBps of read/write throughput (in 1 MB block size) or better (ii) 40 GBps of read/write throughput (in 1 MB block size) across the usable 2 PB proposed storage system.	The overall storage system should be able to deliver at least 30 GBps of read/write throughput (in 1 MB block size) or better across the usable 2 PB proposed storage system.
20	General conditions (Network connectivity)	Each node should have Network port compatibility with InfiniBand connectivity capacity of Minimum 100Gbps	Each node should have Network port compatibility with InfiniBand / OPA connectivity capacity of Minimum 100Gbps
21	Misc	Both the hardware and software components should be from an original equipment manufacturer (OEM). It is preferable that the bidder for storage solution should be the same OEM/Authorized Partner/service provider of the OEM for the computing cluster and vice versa. In case the tenderer is an Authorized Partner or Service Provider a valid Agency-ship/Dealership Certificate to quote on behalf of OEM should also be enclosed along with the technical bid. A document in support of this must be enclosed.	The hardware should be from an original equipment manufacturer (OEM). Required management softwares to be installed by the bidder. It is preferable that the bidder for storage solution should be the same OEM/Authorized Partner/service provider of the OEM for the computing cluster and vice versa. In case the tenderer is an Authorized Partner or Service Provider a valid Agency-ship/Dealership Certificate to quote on behalf of OEM should also be enclosed along with the technical bid. <b>A document in support of this must be enclosed.</b>
22	Annex-VII Other Mandatory Conditions	Stability: Quoted storage solution must have at least three installations of 1 PB, with similar or better throughput. 2. Bidders need to submit the benchmark for 2 PB Storage System with ( i ) 30 GBps or (ii) 40 GBps of read/write throughput (in 1 MB block size) across the usable 2 PB proposed storage system with the bid. Submitted Benchmark must be done on the proposed Storage subsystems. Bidder may submit the benchmark on smaller capacity modules and extrapolate the results for 2 PB. 3. Bidder needs to mention exact number of ports required of EDR InfiniBand and management networks.	1. Stability: Quoted storage solution must have at least One installation of 1 PB, with similar or better throughput. 2. Bidders need to submit the benchmark for 2 PB Storage System with 30 GBps or better read/write throughput (in 1 MB block size) across the usable 2 PB proposed storage system with the bid. Submitted Benchmark must be done on the proposed Storage system. Bidder may submit the benchmark on smaller capacity modules and extrapolate the results for 2 PB. 3. Bidder needs to mention exact number of ports required for InfiniBand /OPA and management networks.
23	Annex-VII Scope of Work	Installation, Commissioning and integration of Compute and storage subsystem in compute cluster and storage system.	Installation, commissioning and integration of Compute cluster and storage solution.
		<b>The same changes as mentioned in Section 4 -Technical specifications has been incorporated in Section 5 (Part-A) Annexure - VII (Technical Bid) and Section 5: (Part – B) Commercial Bid. Please refer the modified tender document attached.</b>	

Tender for  
**Supply, Installation and Deployment of  
Computing cluster and Storage system  
with Scalable Architecture suitable for  
high performance computing**

**Tender No.**  
CNS/IISC/JTTO/HPCS/07/2019



Centre for Neuroscience  
Indian Institute of Science  
Bangalore – 560012

March 2019

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## SECTION 1 – BID SCHEDULE

Tender No	CNS/IISC/JTTO/HPCS/07/2019
Tender Date	21 <sup>st</sup> March 2019
Item Description	SUPPLY, INSTALLATION AND DEPLOYMENT OF COMPUTING CLUSTER AND STORAGE SYSTEM, BOTH WITH SCALABLE ARCHITECTURE, SUITABLE FOR HIGH PERFORMANCE COMPUTING
Tender Type	<b>Two Bid System:</b> <b>Technical Bid (Part-A); Commercial Bid (Part-B)</b>
Pre Bid Meeting date, Time and Place	05 <sup>th</sup> April 2019 by 10:30 am and Centre for Neuroscience, IISc
Place of Submission and tender opening	Centre for Neuroscience, Indian Institute of Science, Bengaluru – 560012
Last Date & Time for submission of tender	29 <sup>th</sup> April 2019 by 3:00pm
Date and time of opening of Technical Bid (Part A)	29 <sup>th</sup> April 2019 by 3:30pm
Address for Correspondence	Senior Administrative Officer, TATA Trusts project, Centre for Neuroscience, Indian Institute of Science, Bengaluru - 560012 Contact No: 080 22933431

## SECTION 2 – ELIGIBILITY CRITERIA

1. The Principal Manufacturer (OEM) of Servers/ Storage System or their Indian Subsidiary can submit the bid.
2. The Authorised System Integrator (SI) of Principal Manufacturer (OEM) of Compute Server and Storage System can submit the bid. The specific authorisation letter from Principal/s, as per **Annexure - I** must be submitted along with the technical bid.
  - 2.1. The primary bidder is the one who responds to this tender and the order will be placed on them. The primary bidder, henceforth referred to as the bidder, may be an OEM of HPC and/or Storage system or a reputed System Integrator (SI) with proven track record for HPC with storage systems installation and maintenance.
3. The Principal Manufacturer (OEM) of Compute cluster, Storage System and their Indian agent/ SI cannot bid simultaneously.
4. Bidder should have minimum annual sales turnover of Rs. 10 Cr. for each of last three financial years (**Annexure - II**).
  - 4.1. Benefits available to MSME as given by Government of India will be considered. Please provide appropriate documents.
5. The bidder should have implemented at least 3 or more high performance compute cluster above or equal to 20 TFlops and 1 PB storage systems with similar or better throughput, anywhere in the world. Reference and purchase order copies of previous installations are required (**Annexure - III**). If the bidder happens to be a SI, then either the bidder or the OEM should meet the above condition; the bid should include the authorization letters from the OEM. The technical bid should clearly demarcate the responsibilities between the bidder and the OEM. Complete details of the same have to be submitted with the bid.
  - 5.1. The successful bidder, during the contractual period, has to address the complete requirement of supply, installation, commissioning, integration as well as warranty and AMC services after the satisfactory acceptance of the solution by the Purchaser.
  - 5.2. The solution quoted by the bidder for meeting the above stated requirement may require best in class point products/systems from multiple OEMs in order to ensure that all the stipulated requirements are met and the solution is optimal and cost-effective. Therefore the integration and interfacing required across the proposed products is the responsibility of the bidder and should be appropriately achieved to meet the overall requirement.
6. If the bidder is an SI, then the bidder should have at least 5 (five) years' experience in supply, installation, and deployment of scalable compute cluster and storage system for high performance computing to Central/State Govt. Departments/ PSUs/Banks/Academic and research Institutions/reputed organizations (**Self declaration Annexure - IV**)

7. The bidder has to quote exactly as per the specifications mentioned for entire compute and/or storage solution. Partial offers for storage or compute will not be accepted.
8. The Bidder should not be currently blacklisted by any institution, bank in India or abroad. **(Self declaration Annexure - V)**
9. The Bidder should accept tender terms & conditions. **(Annexure - VI)**

**The bidders should provide sufficient documentary evidence to support the eligibility criteria. IISc reserves the right to reject any bid not fulfilling the eligibility criteria.**

### **SECTION 3 – TERMS AND CONDITIONS**

#### **1. Submission of Tender:**

- 1.1. All documentations in the tender should be in English.
- 1.2. The Two-bid system will be followed for this tender.
  - Technical Bid (Part-A) – Technical bid consisting of all technical details along with commercial terms and conditions; and
  - Commercial Bid (Part-B) – Indicating item wise price for the items mentioned in the technical bid.
- 1.3. Part A & Part B be put in separate covers and sealed.
- 1.4. The tender number and the due date should be superscripted on both the envelopes and both these sealed covers are to be put in a bigger cover which should also be sealed and duly superscripted with the Tender No. & Due Date. If the quotation cover is not sealed, it will be rejected.
- 1.5. All communications are to be addressed to the Senior Administrative Officer, TATA Trusts project, Centre for Neuroscience, Indian Institute of Science, Bengaluru – 560012, E-mail: subramanyam@iisc.ac.in, Contact No: 080 22933431.
- 1.6. IISc reserves the right to accept or reject any bid and to annul the bidding process and reject all binds at any time prior to the award of contract, without thereby incurring any liability to the effected bidder or bidders or any obligation to inform the affected bidder or bidders.
- 1.7. If price is not quoted in commercial bid as provided in tender document then the bid is liable to be rejected.
- 1.8. Incomplete bids will be summarily rejected.



## **2. Pre-Bid Meeting:**

The pre-bid meeting will be held at Centre for Neuroscience, IISc as given in schedule to sort out/resolve queries raised by the prospective bidders regarding the tender scope, terms & conditions etc. The prospective bidders requiring any clarification of the bidding document may send their queries in writing through e-mail. IISc will respond to these queries during the pre-bid meeting. The queries/doubt/clarifications etc. must be sent at least two days prior to the date of pre-bid meeting.

## **3. Cancellation of Tender:**

Notwithstanding anything specified in this tender document, IISc Bangalore, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

- a. To accept OR reject lowest tender or any other tender or all the tenders.
- b. To accept any tender in full or in part.
- c. To reject the tender offer not confirming to the tender terms.

## **4. Period of validity of bids:**

Bids shall be valid for minimum 120 days from the date of opening of technical bids.

## **5. Evaluation of Offer:**

- 5.1. The duly constituted Committee shall evaluate the bids. The Committee shall be empowered to take appropriate decisions on minor deviations, if any. The decisions of Committee shall be final and binding on all the bidders.
- 5.2. The technical bids will be evaluated in two steps.
- 5.3. The bids will be examined based on eligibility criteria stipulated at Section – II to shortlist the eligible bidders.
- 5.4. The technical bids of only the eligible bidders shall be evaluated based on technical specifications stipulated at Section – IV.
- 5.5. The bidders whose technical bid is found to meet both the requirements as specified above will qualify for opening of the commercial bid and will be informed about the date and time of the opening of the commercial bid.
- 5.6. The bidder's name, bid prices, discounts and such other details considered as appropriate by IISc, will be displayed at the time of opening of the commercial bids.
- 5.7. The bidders should be prepared to make a technical presentation to the committee at a short notice.

5.8.Pre- qualification of the bidders shall not imply final acceptance of the Commercial Bid.

The agency may be rejected at any point during Technical evaluation or during Commercial evaluation. The decision in regard to acceptance and / or rejection of any offer in part or full shall be the sole discretion of IISc, and decision in this regard shall be binding on the bidders.

5.9.The award of contract will be subject to acceptance of the terms and conditions stated in this tender.

5.10.Offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:

- a. Non-submission of complete offers.
- b. Receipt of bids after due date and time and or by email / fax (unless specified otherwise).
- c. Receipt of bids in open conditions.

5.11.In case any BIDDER is silent on any clauses mentioned in this tender documents, IISc Bangalore shall construe that the BIDDER had accepted the clauses as of the tender and no further claim will be entertained.

5.12.No revision in the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.

## **6. Comparison of Bids**

6.1.Only the short-listed bids from the technical evaluation shall be considered for commercial comparison.

6.2.The prices quoted for all the items as per Annexure – VII : Price Bid, (excluding taxes and duties) will be taken for evaluation and comparison.

6.3.The prices offered in foreign currency, if any will be converted to INR for the comparison. The exchange rate **as on date of opening of commercial bids** will be taken for this conversion.

## **7. Award of Contract**

IISc shall award the contract to the eligible bidder whose Technical bid has been accepted and determined as the lowest evaluated commercial bid based on the Grand Total calculated of all items. Taxes and other duties are applicable as per norms. However, IISc reserves the right and has sole discretion to reject the lowest evaluated bid.

## **8. Prices**

8.1.The price quoted shall be considered firm and no price escalation will be permitted (except Govt. Statutory Levies).

8.2.The bidder may quote in INR or Foreign Currency or partly in INR and partly in Foreign Currency. The installation, commissioning and training charges must be quoted in INR only.

8.3. Bidder must indicate applicable Customs Duty and GST separately for each item. The bidder should exercise utmost care to quote the correct percentage of applicable duty and GST on each item.

8.4. In case due to any error/ oversight, the Duty and/ or GST rate quoted by the bidder is different than the actual rate as per the tariff, the bidder will not be permitted to rectify the error/oversight. The orders/ contract will be placed with the rate quoted by the bidder or actual tariff rate (as on placement of order), whichever is LOWER. The difference amount payable, if any, between the quoted rate and actual tariff rate shall be borne by the bidder

8.5. If IISc decides to issue the Customs Duty and / or GST concession certificate, the bidder should charge the concessional rate of Customs Duty and GST, as applicable.

8.6. The prices quoted must be including of packing, forwarding, insurance, loading/unloading charges, customs clearing charges (if applicable) and all incidental charges till destination.

8.7. The exact rate of taxes, charges currently applicable (as per Tariffs) must be mentioned in the 'commercial bid format'. The statutory taxes and duties applicable at the time of supply of material shall be applicable.

8.8. The responsibility, cost and risk of the consignment shall rest with the bidder till receipt of goods is acknowledged by the end user. However, such receipt/ acknowledgement shall not be treated as acceptance of goods.

## **9. Software Licenses: (if applicable)**

The software licenses, if any, shall be required in the name of IISc. The licenses shall contain paper licenses and at least one set of media (CDs) – wherever applicable.

## **10. Performance Bank Guarantee (PBG):**

The successful bidder will be required to furnish the Performance Bank Guarantee towards the compute cluster, storage system, interconnect, software etc. supplied, in the form of a Bank Guarantee in INR equivalent to 10% amount of the Purchase Order value. This bank guarantee should be submitted along with the invoice after successful installation within 15 days. The Bank Guarantee shall remain valid for the period of 37 months from the date of installation. The PBG must be negotiable at a branch of issuing bank in India. In case of no warranty claims towards the items under warranty, the PBG will be returned on completion of warranty period.

## **11. Completeness Responsibility:**

Notwithstanding the scope of supply and services stated in this document, any material, item or services which are not specifically mentioned in this document, but which – **in view of the bidder** - are necessary for attaining the stipulated performance of the compute cluster and storage system for high performance computing, should be quoted by the bidder as 'Addition Essential Items'. The prices quoted for these items shall be considered for the purpose of evaluation and comparison of bids.

## **12. Warranty:**

12.1. The bidder warrants that all the goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract. The bidder further warrants that all goods supplied under this contract shall have no defect arising from design, materials or workmanship (except when the design and/or material is required by the Purchaser's specifications) or from any act or omission of the bidder. The warranty should be comprehensive on site, repair/replacement basis free of cost.

12.2. All the equipment and components supplied must have 3 (Three) years onsite comprehensive warranty with 24x7 support along with 4 hours response time and resolution time of Next Business Day resolution, covering all parts & labor starting from the date after the successful installation, demonstration of performances and acceptance by IISc, Bengaluru. During the warranty period, bidder will have to undertake comprehensive maintenance of the entire hardware components, equipment, support and accessories supplied by the bidder at the place of installation of the equipment.

12.3. The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. It should be completed within Next Business Day resolution for entire solutions after the intimation of fault.

Goods requiring warranty replacements must be replaced on free of cost basis.

12.4. IISc reserves the right to invoke the Performance Bank Guarantee submitted by bidder, in case of the following:

- a. The compute cluster and storage system components/solutions fail to achieve the performance as stipulated in this document or
- b. The bidder fails to provide the warranty and other services in scheduled time frame, as stipulated in this document or
- c. The bidder delays to provide the warranty services as stipulated in this document.

## **13. Acceptance Criteria:**

13.1. Installation, Commissioning and integration of compute cluster and storage system at IISc by bidder.

13.2. Configuration of Compute, storage and backup policies.

13.3. Demonstration of Compute and Storage benchmark as mentioned in Section - IV.

## **14. Payments:**

Payment terms mentioned below:

70% amount of the order value will be released against shipping documents through letter of credit.

20% amount of the order value will be released against installation, commissioning and demonstrating the benchmarks and completing the acceptance criteria through letter of credit.

Balance 10% amount shall be released against submission of PBG, as per clause 10 of Section III given above. PBG must be submitted within 15 days from the date of acceptance report. In case of non-submission of PBG within 15 days, any loss due to fluctuation in foreign exchange rates will be at beneficiary account.

The LC operating charges within India shall be to IISc account and those for outside India shall be to beneficiary's account. LC confirmation charges, if required shall be to beneficiary account. The charges towards LC amendment required on request of beneficiary shall be to beneficiary account.

Applicable TDS will be deducted.

### **15. Delivery Schedule:**

Delivery and Installation at IISc, Bangalore within 6-8 Weeks from the date of issue of purchase order.

### **16. Penalty for delayed Delivery /Services:**

16.1.IISc reserves the right to levy penalty @ of 0.5 % of order value per week of delay beyond the scheduled deliveries / execution of the order successfully, subject to maximum of 5 % of the order value.

16.2.IISc reserves the right to cancel the order in case the delay is more than 10 weeks.

16.3.The delay in delivery and/or installation not attributed to bidder viz. delay in site preparation, delay in submission of required documents (by IISc) etc. and the conditions arising out of Force Majeure will not be considered for the purpose of calculating penalties.

### **17. Force Majeure:**

IISc may consider relaxing the penalty and delivery requirements, as specified in this document, if and to the extent that, the delay in performance or other failure to perform its obligations under the contract is the result of an Force Majeure. Force Majeure is defined as an event of effect that cannot reasonably be anticipated such as acts of God (like earthquakes, floods, storms etc.), acts of states / state agencies, the direct and indirect consequences of wars (declared or undeclared), hostilities, national emergencies, civil commotion and strikes at successful Bidder's premises or any other act beyond control of the bidder.

### **18. Disputes and Jurisdiction:**

Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore.

**19. General:**

19.1.All amendments, time extension, clarifications etc, within the period of submission of the tender, will be uploaded on the IISc website only. Bidder Should regularly visit the above website to keep themselves updated. No extension in the bid due date/time shall be considered on account of delay in receipt of any document by mail.

19.2.The bidder may furnish any additional information, which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. It is however, advised not to furnish superfluous information.

19.3.Any information furnished by the bidder found to be incorrect either immediately or at a later date, would render him liable to be debarred from tendering/taking up of work in IISc, Bangalore.

Senior Administrative Officer,  
TATA Trusts project,  
Centre for Neuroscience,  
Indian Institute of Science,  
Bengaluru - 560012  
Contact No: 080 22933431

## SECTION 4 –TECHNICAL SPECIFICATIONS

### Compute cores and Storage system with the following specification:

The essential specifications are 1024 compute cores in the computing cluster suitable for high performance computing and a separate 2PB usable storage system with required hardware infrastructure for scalability up to usable 10 PB storage solution. Both should be scalable in architecture. The maximum scalability should be at least 4000 cores for the computing cluster and 10 PB for the storage system. Bidder should inform about the maximum storage and compute cores possible for expansion in the architecture.

<b>PART-A (Compute Cluster and Storage System suitable for high performance computing)</b>		
<b>Equipment 1: Compute cluster and Network switch</b>		
1	Processors	Minimum Intel Xeon Gold Skylake with at least 22 MB cache and minimum clock speed of 2.6 GHz. The processor should also support AVX 512 instruction set.
		2 X 16GB Tesla v100 GPU cards or equivalent in One of the compute node with NVLink communication and support for deep learning software (please list compatible softwares, dev tools and extent of support).
2	Motherboard	Dual-socket type; the model should be specified in the bid.
3	Core count per node	Minimum 32 cores per node
4	RAM per node	Minimum 192GB memory in balanced configuration All populated DIMMs should support minimum 1TB (DDR4)
5	HDD	Minimum 1TB Enterprise hard disk per node; with at least 10000 RPM
6	One Master Node and One Login Node with same specifications	Minimum Intel Xeon Gold Processors with at least 22 MB cache and minimum clock speed of 2.6 GHz or more is required. This node should have minimum 32 cores. Dual-socket type; the model should be specified. Minimum 192GB DDR4 memory in balanced configuration is required. SSD for OS 2 x 480GB with mirroring is required. Minimum 4 x 4000GB, 7200 RPM, Enterprise HDD(s) is required. Minimum 12Gb/s Eight-Port SAS Internal RAID Adapter with RAID 0, 1, 5, 6, 10, 50 and 60 should be supported. Network connectivity compatibility of at least 1GbE and 100Gb/s should be supported. Management LAN and KVM over LAN is required.

7	Network switch	InfiniBand / OPA Switch should be of minimum 100Gbps speed and the appropriate connectors should be provided for the mentioned Switch. Bidder should quote for appropriate numbers of GigE Switches for secondary connectivity.
8	Virtualization and aggregation software	Appropriate software for scalable hardware virtualization and/or hypervisor environment, tools for efficient provisioning, automated resource management tools, troubleshooting and fault isolation, along with support should be quoted for. Preference to be given for software supporting virtualization with aggregation. Any special mapping of physical resources directly to the VMs to achieve the benchmark figures must be explicitly stated. This should be compatible with the container framework.

<b>9</b>	<b>Equipment 2: Storage system</b>	
9.1	2PB usable storage capacity using NL-SAS enterprise grade hard disks. The storage should support 0, 1, 5, 6 and 10 Hardware RAID levels. Fast rebuilds: Storage must offer fast rebuild capability for replacing failed drives. Bidders must demonstrate rebuilding 4TB or higher capacity drive in less than 10 hours.	
9.2	Disk Type should support SSD, SAS, NL-SAS drives in same enclosure for flexibility of scalable addition in future.	
9.3	The entire storage solution should be scalable to usable 10 PB in future, with seamless integration. Bidder should quote for 2 PB with required hardware infrastructure for scalability up to usable 10 PB storage solution.	
9.4	Storage solution with automated I/O path failover - active redundant hardware RAID controller while maintaining read/write throughput as mentioned below is to be quoted. Specifications for the hardware RAID controller should be specified in the bid.	
9.5	Storage solution should effectively connect to compute by minimum 100 Gbps (a high bandwidth, low latency network of switches) to connect to all compute nodes directly.	
9.6	The overall storage system should be able to deliver at least 30 GBps of read/write throughput (in 1 MB block size) or better across the usable 2 PB proposed storage system.	
9.7	The storage should support parallel file system deployment such as Lustre or equivalent.	
9.8	All the components should be redundant to avoid any single point of failure.	
9.9	Must include Storage Management software, to centrally manage all Storage subsystems, Multi-path (Load Balancing, Failover, High Availability), LUN masking and should Support RAID migration on to the vacant space available.	



<b>PART-B (UPS and other requirements)</b>		
1	Power Requirement (UPS)	UPS for the entire computing and storage architecture should be quoted separately. Bidder should mention the UPS capacity and backup period. Space requirements of the UPS should also be provided. UPS should be able to support dual source power. UPS should have 3 phase input and 3 phase output.
2	Server Rack	<p>The Server rack also should be quoted according to the requirement.</p> <p>The combined rack height of all the chassis provided should be standard Server racks according to the requirement. If the power plugs are NOT the standard 15 Amps round pin plug, the bidder must provide a power strip with industrial input plugs to be fixed in the rack.</p> <p>Power requirement for the racks and for the Nodes should be calculated and informed for the Electrical infrastructure.</p>
3	Cooling for Nodes and Server Room	<p>Efficient Cooling system detail should be provided and quoted to maintain the nodes and optimal temperature in the room as we do not have chillers in place currently.</p> <p>All the proposed nodes should be efficiently cooled. Please provide in the quote the BTUs produced per hour, both per node and in total by all nodes. Please mention the cooling requirement for the above-mentioned Cluster and storage specification. Retrofitted liquid coolers or equivalent architecture should be enabled in the system for efficient cooling, as required in any standard cluster suitable for high performance computing.</p>

<b>General Conditions</b>	
Network connectivity	Each node should have Network port compatibility with InfiniBand / OPA connectivity capacity of Minimum 100Gbps
Compute Cluster and storage Management	<p>-&gt; The compute and storage cluster should support and needs to be installed with the necessary schedulers, drivers and connectors for running and monitoring container-based jobs, Spark with HDFS based jobs and MPI based jobs, thin client environment, state of the art database systems like Postgre SQL or equivalent.</p> <p>-&gt; The storage solution should be a single parallel filesystem storage solution without data duplication.</p> <p>-&gt; Benchmark performance figures including IO transfer rate should be mentioned for the proposed hardware.</p>
Miscellaneous	<p>On all the nodes (master + compute nodes), the bidder will install the latest 64-bit stable version of CentOS along with the support of all the necessary source code compilation and configuration tools such as cmake, make, etc.</p> <p>The compute nodes should be rebuildable through network install with a kick start file from the master nodes. The user space (RAIDed on the master node) and software directories will be mounted via a standard network file system.</p>
	Any servicing of compute cluster and storage system will be handled by the respective bidder.
	The bidder must explicitly include statements in the bids that they agree to the above mode of use of the machines and that such a utilization will have no adverse effect on the warranty of the servers and cluster. The absence of clear statements to this effect will lead to disqualification.
	The hardware should be from an original equipment manufacturer (OEM). Required management softwares to be installed by the bidder. It is preferable that the bidder for storage solution should be the same OEM/Authorized Partner/service provider of the OEM for the computing cluster and vice versa. In case the tenderer is an Authorized Partner or Service Provider a valid Agency-ship/Dealership Certificate to quote on behalf of OEM should also be enclosed along with the technical bid. <b>A document in support of this must be enclosed.</b>
	All the components that go in the server (RAM, HDD, etc.) must be tested and validated by the motherboard manufacturer.

	<p>The entire solution should have redundant power supplies and compatible to at least platinum level (96%). Power consumption of the compute cluster and storage system should be provided.</p>
	<p>IISc may decide to increase/decrease node count at the time of negotiation based on requirement.</p>
	<p>The entire solution must be factory integrated. No on-site integration is allowed.</p>
	<p>All equipment must be compatible with Indian Electrical Standards/Codes.</p>
	<p>Non-disclosure of various technical specifications listed above may lead to disqualification.</p>
	<p>If a bidder wins the order, the payment for the product shall be made to the winning bidder after delivery, set-up, and satisfactory verification of the product components. Any component errors detected at the time of the OS installation should be promptly rectified, and the warranty period should be correspondingly extended.</p>
	<p>During the warranty period, bidder will have to undertake comprehensive maintenance of the entire hardware, hardware components, equipment, software support and accessories supplied by the bidder at the place of installation of the equipment. The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. It should be completed within 2 working days for individual server and next working day for central components like power supply, networking and storage after the intimation of fault.</p>
	<p>A letter of commitment for three years with respect to hardware support from the OEM should be enclosed in the cover for Technical bid. Appropriate support for software should also be clearly mentioned in a technical bid. <b>Offers will be rejected if they are not accompanied by commitment letter from the OEM.</b></p>
	<p>Additionally, the bidder must provide three references where they have carried out installations of equal to or above 20 TFlops and 1 PB Storage in the past 3 years. The Purchase Committee shall independently obtain inputs from the provided referees before arriving at a final decision.</p>

Tender No:  
CNS/IISC/JTTO/HPCS/07/2019

Dated: 20<sup>th</sup> March 2019

**Supply, Installation and Deployment of Computing  
cluster and Storage system with Scalable Architecture  
suitable for high performance computing**

**Section 5 : BID**

**Part – A : Technical Bid**

**Centre for Neuroscience  
Indian Institute of Science  
Bangalore-560012**

## Bidder details

The bidder must provide the following mandatory information & attach copies wherever mentioned:

Details of the Bidders		
No	Description	Particulars
1	Name of the Bidder	
2	Nature of Bidder  (Pvt Ltd or Public Ltd Co/ Partnership firm etc)	
3	Registration No/ Trade License, (if any attach copy)	
4	Registered Office Address	
5	Address for Communication	

6	Contract person Name  Designation	
7	Telephone No	
8	Email ID  Website	
9	PAN No. (attach copy If applicable)	
10	CST/VAT No. (attach copy If applicable)	
11	Service Tax registration No. (attach copy)	

(Signature of the Bidder) Printed Name

Designation, Seal

**Undertaking by Principal Manufacturer(S)**

To,  
The Senior Administrative Officer,  
TATA Trusts project,  
Centre for Neuroscience,  
Indian Institute of Science,  
Bengaluru - 560012

**Ref : Tender No: ----- Dated: -----**

**Supply, Installation and Deployment of Computing cluster and Storage system with Scalable Architecture suitable for high performance computing**

Dear Sir,

We, M/s \_\_\_\_\_ (Name of the manufacturer) having registered office at \_\_\_\_\_ (address of the manufacturer) by virtue of being manufacturer for (Name of the product/s), hereby certify that M/s \_\_\_\_\_ (Name of the bidder) having their office at (Address of bidder) are our Authorised System.

Integrator for our range of products quoted by them, as listed below:

- 1.
- 2.

Within the scope of requirement as per the tender mentioned above, we undertake to provide technical & other support towards fulfilling the requirements of installation, commissioning, benchmarking, acceptance criteria and product warranty services of the compute cluster and storage system components to be supplied and installed at IISc Client's site by M/s. (Name of bidder) against said tender.

We also certify that the products offered are not nearing end-of-life / end-of-support six years down the line from the date of bidding.

The undersigned is authorised to issue this certificate on behalf of M/s \_\_\_\_\_(Name of the manufacturer).

For M/s \_\_\_\_\_ (Name of the manufacturer)

Signature & company seal

Name Designation

Email

Mobile no

**Annual sales Turnover**

<b>Financial Year</b>	<b>Turn over (In Lakhs)</b>	
2015-2016		
2016-2017		
2017-2018		

Enclose audited statements for all the Three years

(Signature of the Bidder) Printed Name



**Past Purchase Orders**

Details of the Purchase Orders executed during the last three years 2015-2016, 2016-17 & 2017-18

Sl No	Order Number and date	Items	Value	Name of Organization	Contact Person Name and Designation	Contact Details with E-mail	Date of Completion

Enclose copy of purchase order

(Signature of the Bidder) Printed Name

**Declaration Regarding Experience**

To,

The Senior Administrative Officer,  
TATA Trusts project,  
Centre for Neuroscience,  
Indian Institute of Science,  
Bengaluru - 560012

**Ref : Tender No: ----- Dated: -----**

**Supply, Installation and Deployment of Computing cluster and Storage system with Scalable Architecture suitable for high performance computing**

Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has more than five years of experience in Supply, Installation and Deployment of Computing cluster and Storage system to Central/State Govt. Departments/ PSUs/Banks/Academic and Research Institutions/reputed establishments.

(Signature of the Bidder)

Printed Name

Designation, Seal

Date :

**Declaration Regarding Clean Track by Bidder**

To,

The Senior Administrative Officer,  
TATA Trusts project,  
Centre for Neuroscience,  
Indian Institute of Science,  
Bengaluru - 560012

Ref: Tender No:----- Dated:-----

Supply, Installation and Deployment of Computing cluster and Storage system with Scalable Architecture suitable for high-performance computing

Sir,  
I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm is not currently debarred / black listed by any Government / Semi Government Organizations / Institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

No	Country in which the company is debarred /blacklisted / case is Pending	Black listed / debarred by Government / Semi Government/Organizations /Institutoins	Reason	Since when and for how long

(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding Period for which the company / firm was blacklisted and the reason/s for the same)

Yours faithfully

(Signature of the Bidder) Printed Name

Designation, Seal

Date :

**Declaration for Acceptance of Terms and Conditions**

To,

The Senior Administrative Officer,  
TATA Trusts project,  
Centre for Neuroscience,  
Indian Institute of Science,  
Bengaluru - 560012

**Ref: Tender No:----- Dated:-----**

**Supply, Installation and Deployment of Computing cluster and Storage system with Scalable Architecture suitable for high-performance computing**

Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)

Printed Name

Designation,Seal

Date :

### Details of Items Quoted

#### Technical Bid

#### **PART-A (Compute Cluster and Storage System suitable for high performance computing)**

<b>Equipment 1: Compute cluster and Network switch</b>					
<b>Description</b>			<b>Compliance</b>	<b>Make / Model No / Part No</b>	<b>Deviation (if any)</b>
1	Processors	Minimum Intel Xeon Gold Skylake with at least 22 MB cache and minimum clock speed of 2.6 GHz. The processor should also support AVX 512 instruction set.			
		2 X 16GB Tesla v100 GPU cards or equivalent in One of the compute node with NVLink communication and support for deep learning software (please list compatible softwares, dev tools and extent of support).			
2	Motherboard	Dual-socket type; the model should be specified in the bid.			
3	Core count per node	Minimum 32 cores per node			
4	RAM per node	Minimum 192GB memory in balanced configuration			
		All populated DIMMs should support minimum 1TB (DDR4)			
5	HDD	Minimum 1TB Enterprise hard disk per node; with at least 10000 RPM			

6	One Master Node and One Login Node with same specifications	<p>Minimum Intel Xeon Gold Processors with at least 22 MB cache and minimum clock speed of 2.6 GHz or more is required.</p> <p>This node should have minimum 32 cores.</p> <p>Dual-socket type; the model should be specified.</p> <p>Minimum 192GB DDR4 memory in balanced configuration is required.</p> <p>SSD for OS 2 x 480GB with mirroring is required.</p> <p>Minimum 4 x 4000GB, 7200 RPM, Enterprise HDD(s) is required.</p> <p>Minimum 12Gb/s Eight-Port SAS Internal RAID Adapter with RAID 0, 1, 5, 6, 10, 50 and 60 should be supported.</p> <p>Network connectivity compatibility of at least 1GbE and 100Gb/s should be supported.</p> <p>Management LAN and KVM over LAN is required.</p>			
7	Network switch	<p>InfiniBand / OPA Switch should be of minimum 100Gbps speed and the appropriate connectors should be provided for the mentioned Switch.</p> <p>Bidder should quote for appropriate numbers of GigE Switches for secondary connectivity.</p>			
8	Virtualization and aggregation software	<p>Appropriate software for scalable hardware virtualization and/or hypervisor environment, tools for efficient provisioning, automated resource management tools, troubleshooting and fault isolation, along with support should be quoted for. Preference to be given for software supporting virtualization with aggregation. Any special mapping of physical resources directly to the VMs to achieve the benchmark figures must be explicitly stated. This should be compatible with the container framework.</p>			

9	<b>Equipment 2: Storage system</b>			
	<b>Description</b>	<b>Compliance</b>	<b>Make / Model No / Part No</b>	<b>Deviation (if any)</b>
9.1	2PB usable storage capacity using NL-SAS enterprise grade hard disks. The storage should support 0, 1, 5, 6 and 10 Hardware RAID levels. Fast rebuilds: Storage must offer fast rebuild capability for replacing failed drives. Bidders must demonstrate rebuilding 4TB or higher capacity drive in less than 10 hours.			
9.2	Disk Type should support SSD, SAS, NL-SAS drives in same enclosure for flexibility of scalable addition in future.			
9.3	The entire storage solution should be scalable to usable 10 PB in future, with seamless integration. Bidder should quote for 2 PB with required hardware infrastructure for scalability up to usable 10 PB storage solution.			
9.4	Storage solution with automated I/O path failover - active redundant hardware RAID controller while maintaining read/write throughput as mentioned below is to be quoted. Specifications for the hardware RAID controller should be specified in the bid.			
9.5	Storage solution should effectively connect to compute by minimum 100 Gbps (a high bandwidth, low latency network of switches) to connect to all compute nodes directly.			
9.6	The overall storage system should be able to deliver at least 30 GBps of read/write throughput (in 1 MB block size) or better across the usable 2 PB proposed storage system.			
9.7	The storage should support parallel file system deployment such as Lustre or equivalent.			
9.8	All the components should be redundant to avoid any single point of failure.			
9.9	Must include Storage Management software, to centrally manage all Storage subsystems, Multi-path (Load Balancing, Failover, High Availability), LUN masking and should Support RAID migration on to the vacant space available.			

**PART-B (UPS and other requirements)**

<b>Description</b>		<b>Compliance</b>	<b>Make / Model No / Part No</b>	<b>Deviation (if any)</b>
1	Power Requirement (UPS)	UPS for the entire computing and storage architecture should be quoted separately. Bidder should mention the UPS capacity and backup period. Space requirements of the UPS should also be provided. UPS should be able to support dual source power. UPS should have 3 phase input and 3 phase output.		
2	Server Rack	The Server rack also should be quoted according to the requirement. The combined rack height of all the chassis provided should be standard Server racks according to the requirement. If the power plugs are NOT the standard 15 Amps round pin plug, the Bidder must provide a power strip with industrial input plugs to be fixed in the rack. Power requirement for the racks and for the Nodes should be calculated and informed for the Electrical infrastructure.		
3	Cooling for Nodes and Server Room	Efficient Cooling system detail should be provided and quoted to maintain the nodes and optimal temperature in the room as we do not have chillers in place currently.  All the proposed nodes should be efficiently cooled. Please provide in the quote the BTUs produced per hour, both per node and in total by all nodes. Please mention the cooling requirement for the above-mentioned Cluster and storage specification. Retrofitted liquid coolers or equivalent architecture should be enabled in the system for efficient cooling, as required in any standard cluster suitable for high performance computing.		



<b>General Conditions</b>				
<b>Description</b>		<b>Compliance</b>	<b>Make / Model No / Part No</b>	<b>Deviation (if any)</b>
Network connectivity	Each node should have Network port compatibility with InfiniBand / OPA connectivity capacity of Minimum 100Gbps			
Compute Cluster and storage Management	<p>-&gt; The compute and storage cluster should support and needs to be installed with the necessary schedulers, drivers and connectors for running and monitoring container-based jobs, Spark with HDFS based jobs and MPI based jobs, thin client environment, state of the art database systems like Postgre SQL or equivalent.</p> <p>-&gt; The storage solution should be a single parallel filesystem storage solution without data duplication.</p> <p>-&gt; Benchmark performance figures including IO transfer rate should be mentioned for the proposed hardware.</p>			
Miscellaneous	<p>On all the nodes (master + compute nodes), the bidder will install the latest 64-bit stable version of CentOS along with the support of all the necessary source code compilation and configuration tools such as cmake, make, etc.</p> <p>The compute nodes should be rebuildable through network install with a kick start file from the master nodes. The user space (RAIDed on the master node) and software directories will be mounted via a standard network file system.</p>			
	Any servicing of compute cluster and storage system will be handled by the respective bidder.			
	The bidder must explicitly include statements in the bids that they agree to the above mode of use of the machines and that such a utilization will have no adverse effect on the warranty of the servers and cluster. The absence of clear statements to this effect will lead to disqualification.			

	The hardware should be from an original equipment manufacturer (OEM). Required management softwares to be installed by the bidder. It is preferable that the bidder for storage solution should be the same OEM/Authorized Partner/service provider of the OEM for the computing cluster and vice versa. In case the tenderer is an Authorized Partner or Service Provider a valid Agency-ship/Dealership Certificate to quote on behalf of OEM should also be enclosed along with the technical bid. <b>A document in support of this must be enclosed.</b>			
	All the components that go in the server (RAM, HDD, etc.) must be tested and validated by the motherboard manufacturer.			
	The entire solution should have redundant power supplies and compatible to at least platinum level (96%). Power consumption of the compute cluster and storage system should be provided.			
	IISc may decide to increase/decrease node count at the time of negotiation based on requirement.			
	The entire solution must be factory integrated. No on-site integration is allowed.			
	All equipment must be compatible with Indian Electrical Standards/Codes.			
	Non-disclosure of various technical specifications listed above may lead to disqualification.			
	If a bidder wins the order, the payment for the product shall be made to the winning bidder after delivery, set-up, and satisfactory verification of the product components. Any component errors detected at the time of the OS installation should be promptly rectified, and the warranty period should be correspondingly extended.			
	During the warranty period, bidder will have to undertake comprehensive maintenance of the entire hardware, hardware components, equipment, software support and accessories supplied by the bidder at the place of installation of the equipment. The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. It should be completed within 2 working days for individual server and next working day for central components like power supply, networking and storage after the intimation of fault.			

	<p>A letter of commitment for three years with respect to hardware support from the OEM should be enclosed in the cover for Technical bid. Appropriate support for software should also be clearly mentioned in a technical bid. <b>Offers will be rejected if they are not accompanied by commitment letter from the OEM.</b></p>			
	<p>Additionally, the bidder must provide three references where they have carried out installations of equal to or above 20 TFlops and 1 PB Storage in the past 3 years. The Purchase Committee shall independently obtain inputs from the provided referees before arriving at a final decision.</p>			

**Instructions to bidders:**

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate which of the technical specifications (key specifications or desirable specifications) they are able to meet or otherwise, IISc may ask for clarifications or further information.

**Other Mandatory Conditions: (Compliance to be given for each point)**

1. Stability: Quoted storage solution must have at least One installation of 1 PB, with similar or better throughput.
2. Bidders need to submit the benchmark for 2 PB Storage System with 30 GBps or better read/write throughput (in 1 MB block size) across the usable 2 PB proposed storage system with the bid. Submitted Benchmark must be done on the proposed Storage system. Bidder may submit the benchmark on smaller capacity modules and extrapolate the results for 2 PB.
3. Bidder needs to mention exact number of ports required for InfiniBand / OPA and management networks.
4. Bidder must provide solution compatible to latest CentOS based client servers and provide required drivers, client software and related support.
5. Documentations: Detailed solution description along with architecture diagram, Product Data sheets, brochures etc. and detailing compliance to specification.

**Scope of Work:**

1. Installation, commissioning and integration of Compute cluster and storage solution.
2. Configuration of compute cluster, storage and backup policies.
3. Establishing Compute and Storage benchmark.
4. Bidder should provide details of power and cooling requirements.
5. Documentation and Manuals of all sub-systems, configurations and policies implemented.
6. Training on below topics for research members.
  - 6.a. Must cover compute cluster and storage system Hardware management
  - 6.b. Management and Monitoring solution for quoted solution
  - 6.c. Parallel File System and Hadoop File System Management
  - 6.d. System Administration of compute and Storage system.

**Signature of the Bidder**

Tender No:  
CNS/IISC/JTTO/HPCS/07/2019

Dated: 20<sup>th</sup> March 2019

**Supply, Installation and Deployment of Computing cluster and  
Storage system with Scalable Architecture suitable for high-  
performance computing**

**Section 5: BID**  
**Part – B : Commercial Bid**

**Centre for Neuroscience**  
**Indian Institute of Science**  
**Bangalore-560012**

**COMMERCIAL BID (PRICE BID FORMAT)**  
**PART-A (Compute Cluster and Storage)**

<b>Sr No</b>	<b>Name of the Item</b>	<b>Make, Model No, Part No</b>	<b>Unit Cost with Currency</b>	<b>Qty</b>	<b>Customs Duty (if applicable)</b>	<b>GST (%)</b>	<b>Total</b>
1)	Processors GPU cards						
2)	Motherboard						
3)	Core count per node						
4)	RAM per node						
5)	HDD						
6)	One Master Node and One Login Node with same specifications						
7)	Network switches						
8)	Virtualization and aggregation software						
9)	Storage system						
10)	Other Charges (if applicable) In INR Only.						
			Sub-Total (Foreign Currency) components, if any. (excluding Customs / GST)				
			Sub-Total (INR) Components (excluding Customs / GST)				
<b>Bidder may add rows and columns appropriately, if required/felt necessary.</b>							

**PART-B (UPS and other requirements)**

<b>Sr No</b>	<b>Name of the Item</b>	<b>Make, Model No, Part No</b>	<b>Unit Cost with Currency</b>	<b>Qty</b>	<b>Customs Duty (if applicable)</b>	<b>GST (%)</b>	<b>Total</b>
1)	Power Requirement and UPS						
2)	Server Rack						
3)	Cooling for Nodes and Server Room						
4)	Other Charges (if applicable) In INR Only.						
			Sub-Total (Foreign Currency) components, if any. (excluding Customs / GST)				
			Sub-Total (INR) Components (excluding Customs/ GST)				
<p><b>Bidder may add rows and columns appropriately, if required/felt necessary.</b></p>							

**Signature of the Bidder**

## SECTION 6 – CHECK LIST

(This should be enclosed in the Envelop A)

**The following items must be checked before the Bid is submitted:**

### 1. Envelope “A”: Technical Bid

Section 5: Part – A :Technical Bid (each pages duly sealed and signed by the authorized signatory)

Annexure I : Undertaking from OEM

Annexure II : Annual sales Turnover

Annexure III: Details of purchase orders

Annexure IV: Declaration regarding experience

Annexure V : Declaration regarding clean track

Annexure VI : Declaration of acceptance to tender terms and Conditions

Annexure VII: Details of items quoted

Copy of this tender document duly sealed and signed by the authorized signatory on every page.

Checklist

### 2. Envelop “B”: Commercial Bid

Section 5: Part – B : Commercial Bid

Your quotation must be submitted in two envelopes Technical Bid (Envelope A) and Commercial Bid (Envelope B) superscribing on both the envelopes the Tender no. and due date and both these sealed covers are to be put in a bigger cover which should also be sealed and duly super scribed with our Tender No. & Due Date.