Ref. No.: IISc/CDS/YS/Genome/2020-09

Sep 10, 2020. Updated on Sep 24, 2020.

Tender Notification for the Procurement of a Computing Cluster and Storage Server *(Updated)*

Last Date for Bid: Oct 15, 2020 5PM

This is an open tender for the purchase of a Storage Server and a Computing cluster at the Department of Computational and Data Sciences (CDS), IISc, Bangalore for the Genome India Data Analysis project.

The *Storage Server* will serve as the head node of the cluster. It should include local storage as well as have access to distributed storage (e.g., HDFS) on the Computing Cluster, which together are 200TB (0.2PB) or larger, as defined in the specifications given below.

The *Computing Cluster* should follow the specifications given below. The cluster should be expandable to a GPU cluster through the addition of separate GPU servers/workstations in future through the switch. The compute servers supplied do not have to have GPUs installed or need compatibility.

1 Technical Specifications

1.1 Item 1: Storage Server: One unit, with following specification

No.	Component	Specification
1	Processor	• Minimum of 32 cores/64 threads • Minimum clockspeed of 2.4GHz • 1 or 2 Sockets configuration • Should offer a minimum of 1500 Giga FLOPS of Sustained (Rmax) performance per node, to be validated using High Performance Linpack (HPL) by successful bidder before acceptance • Total TDP of less than 500W • Latest generation server processors: Intel Xeon Cascade Lake Scalable (or) AMD EPYC Rome, or more recent • Specify Make/Model of Motherboard
2	Memory	• Minimum of 256GB DDR4 ECC DIMM with homogeneous DIMMs • DDR4-2933 or faster • Expandable to ~~2TB~~1TB
3	SSD	• 950GB (or larger) SSD with NVMe ~~PCI Express SSD~~interface • Form factor is flexible (e.g., M2, U2, PCIe, etc.) • Professional or Enterprise grade • 2GBps (or faster) sequential read/write speed rating • Specify Make/Model
4	HDD	• 8 Nos. of 12TB 3.5" Enterprise SAS HDD at 6Gb/s 7.2K RPM or faster • Total 96TB HDD storage • Specify the make and model • All drives to be mounted on hot-swap drive bays

5	HDD Controller	• High quality 6Gbps SAS hardware RAID Controller to support 8 or more HDD • Minimum 2GB cache, and with battery backup unit • Support for RAID levels 0,1, ~~4,~~5,6, 10 • Specify the make and model.
6	NIC	• 2 x 10 GbE NIC
7	Power Supply	• Redundant power supply of 80 Plus Platinum level, or better • The minimum PSU wattages should be suitable for the provided solution.
8	Form Factor	• 1U/2U Rack mountable Chassis • Specify Make/Model of Chassis
9	Management	• Dedicated DCMI or IPMI 2.0 LAN
10	Expansion slots	• Minimum 2 PCI-3.0/4.0 x16 slots should be free
11	USB	• Minimum 2 USB 2.0 (or better) ports
12	Display Out	• Minimum 1 onboard VGA (or better) port
13	Operating System	• CentOS to be installed • Should support CentOS and Ubuntu
14	Peripherals	• Rack-mounted 19” (or larger) monitor, keyboard and mouse

1.2 Item 2: Computing Cluster: Sixteen nodes, each with the following specification

No.	Component	Specification
1	Processor	• Minimum of 16 cores/32 threads • Minimum clockspeed of 2.4GHz • 1 socket configuration • Should offer a minimum of 750 Giga FLOPS of Sustained (Rmax) performance per node, to be validated using High Performance Linpack (HPL) by successful bidder before acceptance • 1 Socket configuration • Total TDP of less than 250W • Latest generation server processors: Intel Xeon Cascade Lake Scalable (or) AMD EPYC Rome, or more recent • Specify Make/Model of Motherboard
2	Memory	• Minimum of 128GB DDR4 ECC DIMM with homogeneous DIMMs • DDR4-2933 or faster • Expandable to 1TB
3	SSD	• 950GB (or larger) SSD with NVMe interface • Form factor is flexible (e.g., M2, U2, PCIe, etc.) • ~~NVMe PCI Express SSD~~ • Professional or Enterprise grade • 2GBps (or faster) sequential read/write speed rating • Specify Make/Model
4	HDD	• 1 No. 12TB 3.5" Enterprise SAS HDD at 6Gb/s 7.2K RPM or faster

		• Specify the make and model • Drive to be mounted on hot-swap drive bay • Should have a minimum of 2 additional SAS ports for future expansion
5	NIC	• 2 x 10 GbE NIC
6	Power Supply	• Redundant power supply of 80 Plus Platinum level, or better • The minimum PSU wattages should be suitable for the provided solution.
7	Form Factor	• 1U Rack mountable Chassis • Total 4 or more Hot-swap drive bays • Specify Make/Model of Chassis
8	Management	• Dedicated DCMI or IPMI 2.0 LAN
9	Expansion slots	• Minimum ~~2~~ 1 PCI-3.0/4.0 x16 slots should be free
10	USB	• Minimum 2 USB 2.0 (or better) ports
11	Display Out	• Minimum 1 onboard VGA (or better) port
12	Operating System	• CentOS to be installed • Should support CentOS and Ubuntu

1.3 Item 3: Peripherals

No.	Component	Specification
1	Primary Network Switch	• 10GBASE-T Ethernet Switch • 24x 10Gbps copper ports • Minimum of 2 additional SFP+ 10Gbps ports • Cat6 (or better) cabling for all servers
2	Rack/chassis	• Full height rack with space for 32 hot-pluggable 1U nodes, Two 2U node and Four 1U switches (38U available in total) with the required power strip for these provided in the rack. • 38 (or more) compatible sockets with PDU(s) in 3-Phase with MCB(s)-No extra cabling.~~38 or more C-14 socket PDU in 3-Phase with single MCB-No cable.~~ • Network switches ideally located at the top of the rack.
3	Cluster management software	• ROCKS with Ganglia, or other open source cluster management software
4	Management network switch	• 48-port 1 GigE switch, with cables for IMPI interconnect

1.4 Possibility of Additional Procurement

Based on the budget availability, the following additional items may be procured from the successful bidder for the above requirements. Quotes may be provided for these options as well.

1. 4 additional compute nodes
2. 8 additional compute nodes
3. 12 additional compute nodes
4. 1TB of total memory (with homogenous DIMMS) on Storage Server

2 GENERAL TERMS & CONDITIONS

1. **Warranty**: Comprehensive on-site warranty should be valid for a period of 3 years from the date of acceptance of the equipment. The warranty on all components should be included in the quoted costs. During the warranty period, the bidder shall attend to all the hardware problems on site and shall replace the defective parts at no extra cost to the purchaser. During the warranty period, the bidder shall attend to all failures relating to system software installation, configuration, management and performance. Periodic maintenance with respect to system software upgrades, updates and patches, as well as preventive maintenance, are the responsibilities of the bidder.
2. **Two-bid system**: Separate technical and commercial bids should be submitted in individually sealed covers, and superscribed respectively as "CDS/YS/Genome/2020 – Technical Bid" and "CDS/YS/Genome/2020 – Commercial Bid". The two covers must be enclosed in a larger envelope, sealed, superscribed as "CDS/YS/Genome/2020 Cluster".
3. **Multiple bids**: Bidders proposing multiple options must quote for each of them separately, as self-contained bids.
4. IISc may decide to increase/decrease the compute node count beyond 16 based on requirement.
5. The Technical Bid and the Commercial Bid should be duly signed by the authorized representative of the bidder.
6. The bidder should have installation/service center base in Bangalore for such units and a fully equipped service center. Please provide details of Karnataka Registration and Office Address.
7. IISc reserves the right to cancel the tender at any time without assigning any reason whatsoever.

3 TECHNICAL BID – TERMS & CONDITIONS

1. The technical bid must clearly specify the following:
    a. Executive summary of the proposal
    b. Technical details of the system
    c. Technical compliance statement stating compliance against each item in the technical specifications given in the enquiry
    d. Terms and conditions of the offer
    e. Supporting technical materials, including datasheets and brochures, highlighting detailed technical specifications and unique characteristics
    f. A copy of the masked Commercial bid of the bill-of-materials
2. Vendors who include price information in the technical bids will be automatically disqualified.
3. The vendor must provide three references where they have carried out supply, installation and support of clusters at or above 10 TFlops in the past ~~3~~ 5 years. IISc shall independently obtain inputs from the provided referees before arriving at a final decision.
4. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids. Vendors may be required to give presentations.

4 COMMERCIAL TERMS & CONDITIONS

1. Price bids of only technically qualified vendors will be considered. Commercial bid shall be opened for the technically qualified bidders after the technical evaluation. The Institute will communicate, by email provided in the technical bid, the date and time of opening of the

commercial bid to the qualified bidders. Commercial bids will be opened on the said date and time, irrespective of the presence of the bidders / authorized representatives.

2. Costs of individual components: The quotes should give the costs of the individual components including
   a) The cost of the 1 unit of Storage Server Item 1
   b) The unit and the total cost of the 16 Compute Nodes in item 2,
   c) The cost of each peripheral components in item 3.
   d) The cost of each of the 4 options listed in Section 1.4 for possible additional procurement
3. The commercial bid should contain among other things, payment terms, warranty, installation, commissioning etc. as per requirements of IISc mentioned in the tender document. Costs for warranty, installation, commissioning etc., if any, should be listed separately from the equipment components. All such conditions must be in line with the tender. In case of any deviation or conditional offer, the bid may be treated as non-responsive and hence will not be considered for evaluation.
4. Prices may be quoted in US Dollars. IISc is registered with DSIR in order to get concession / exemption in Custom Duty / IGST (for import). Also only 5% GST (for indigenous items) is applicable for IISc purchases as per DSIR registration. IISc will provide necessary documents required for availing concession / exemption in Custom Duty / IGST for import or 5% GST for indigenous items. Bidders should consider these facts while offering their price bids for this tender. RBI price of US dollar on the last date for submitting of tender will be considered for all calculations.
5. Indigenous order should be with GST only and must be on FOR basis. In such cases, any kind of custom duty exemption certificate will not be provided. IISc will only provide relevant documents for availing concession / exemption in GST subject to submission of documents (viz. Proforma Invoice, acceptance of the order) required from vendor side.
6. In case of rupee offer, the component of tax, and any other statutory levies should be shown separately and not included in the total amount, to enable us to avail exemption.
7. In case of imports, the commercial bid should contain among other things, the name and address of the Indian agent, if any, and the agency commission payable to the agent (if any). Import order should be preferably in 'DDP - Delivered Duty Paid – IISc Bangalore' terms. However, we can accept import bids, which is CIP-Bangalore basis also, but in this case, insurance should be on "Warehouse to Warehouse" basis and should not terminate at Bangalore airport. Bids on the FOB or Ex-work basis will not be accepted in case of import order.
8. For DDP, Bill of Entry must be in the name of IISc, Custom duty must be paid by the vendor only. Before release of final payment, all original documents with regard to import must be handed over to IISc, failing which final payment may not be released.
9. For CIP, IISc will arrange for custom clearance from Bangalore Airport. However, it will be sole responsibility of the vendor to provide all documents (e.g. Airway Bill, Invoice, Packing List, Bill of Lading etc.) required for filing of Bill of Entry and custom clearance must be provided to IISc well in advance. In case of any penalty / fine / demurrage is imposed due to delayed submission of documents from the vendor, then such amount will be deducted from the bill of vendor while releasing the payment.
10. Proposals should contain the name and contact details, viz., phone, fax and email of the designated person to whom all future communication will be addressed.

11. Prices should be quoted in detail for all the subsystems given in the Technical Specifications part of the tender. Further, bid and price validity should be for three months from the date of opening of the technical bids.
12. IISc will place the purchase order only on the successful bidder as per the decision of IISc. In this regard, decision of IISc will be final and binding.
13. The lowest bid will be identified as the successful bid. In computing the commercial offer, the cost of the servers, Installation and Commissioning charges, if any, agency charges, if any, and warranty charges for 3 years will be included. Pricing of optional items will not be considered in the cost for deciding the lowest bid.
14. Resolving Price Conflicts: In case of a price conflict, the vendor with the following components will be preferred in the following order of priority.
    a) Higher memory on the compute node
    b) Higher memory on the storage node
    c) Offer of longer duration of warranty

5 PAYMENT TERMS

1. The total project cost will consist of Equipment supply and installation and warranty for three years from the acceptance and successful installation as decided by IISc.
2. On delivery completion, the inventory check will confirm that the systems have been delivered with the ordered configuration. Post this, the vendor shall install and configure the system with CentOS, cluster management software, Cloudera Data Hub (CDH), other system software, users, storage, RAID, IMPI, etc. The vendor shall demonstrate one successful run of High Performance Linpack (HPL) on each storage node and compute nodes independently, which achieves the required Rmax in the tender. Up to 5% performance deviation in HPL Rmax below the tender specification will be allowed. ~~the require per-node performance for HPL~~ The system will be subjected to 48 hours of burn-in test, that includes running of hardware diagnostics and performance tests on all components continuously for a period of 48 hours to eliminate possibility of any hardware failures. The successful completion of this will lead to acceptance of the system.
3. For Indigenous supplies, ~~100~~80% payment shall be released by IISc against delivery~~,~~ and inspection, and remaining 20% payment shall be released against successful installation, commissioning and acceptance of the equipment at IISc Bangalore.
4. For orders placed in foreign currency (Import), payment terms should preferably be 100% payment after delivery, inspection, successful installation, commissioning and acceptance of the equipment at IISc Bangalore in good condition and to the entire satisfaction of the Purchaser. However, IISc may consider payment of 80% of the total order value of equipment only after submission of all valid dispatch documents. Rest of the amount will be paid only after completion of installation, commissioning, inspection and satisfactory acceptance by the IISc Committee followed by submission of satisfactorily report regarding completion of the work by the Committee. Payments will be released through RTGS / LC at the discretion of IISc to be mentioned in the purchase order.
5. Payment will subject to deduction of TDS as per rules / laws and any other deduction as per PO terms.
6. The total solution as per the agreed bill of materials must be supplied within 6 weeks after receiving a firm PO from IISc. The installation and acceptance must be completed within 3 weeks after supply of the equipment.

6 Important Dates

1. Release of tender: **September 10, 2020**
2. Last date for sending queries: **September 21, 2020**. Queries may be sent to Prof. Yogesh Simmhan (simmhan@iisc.ac.in)
3. Pre-bid clarification meet: **September 24, 2020 at 11AM** over Video Conference (to be announced to interested parties). No queries will be entertained after pre-bid clarification meet.
4. Release of corrigendum to the tender based on the queries, if necessary: **September 28, 2020**.
5. Submission of the bid: **October 15, 2020, 5PM IST**

The bid should be addressed to:

The Chair
Department of Computational and Data Sciences (CDS)
Indian Institute of Science (IISc)
Bengaluru India - 560012.