Name of the Work: Supply, installation and commissioning of Computational System for Drug Discovery, System Management Stack and Linux Workstations.

Specifications:

Item 1 - Computational System for Drug Discovery (quantity =1)

Technical Specifications of each Node is as below	
Processor(s)	x86 Architecture based with clock speed of at least 2.35 GHz base frequency, with 32 or more Cores. Supports DDR4 2933 or better memory speed. 1.35MB cache per core or higher, with AVX2 or better instruction set supported natively
No. of Processors	Two or more
Chipset	Compatible Chipset of reputed brand or better
RAM	512GB or more from reputed brand using 64GB memory modules. Memory modules/slots with advanced ECC or Chip-Kill or an equivalent technology. Per node scalability (after populating offered no. of memory modules system must be scalable up to 1536 GB per node)
RAID	SAS 12Gbps controller with provision to support up to 200+ HDDs , and supports RAID 0, 1, 10, 5 ,50 ,60 & 6 with dedicated 2GB cache memory. RAID card must support all HDD bays w/o any additional item to be added with supported backplane for drive bays and JBOD. System must provide array configuration and management utilities, Independent of port auto-negotiation, optional battery backup unit for future upgrade. Must Support Supports SSP, SMP, STP protocols or more
HDD(s)/SSD	HDD/SSD Storage space – using SAS/SATA drives. 24TB storage space or more before RAID 5, using 7.2K RPM based drives . Capacity per HDD must not exceed 6TB. Volume Configured in RAID 5 or equivalent.
Storage Bays	16 or more HOT Swap Drive bays – for SAS and SATA HDDs and SSDs. Which includes at least 2 dedicated NVMe Bays or more . NVMe controller/ports must support RAID 0,1, and 10 natively

	A secondary storage enclosure connected via 12Gbps external SAS link is allowed to be offered to meet the requirement
NIC	2 x 1G (RJ-45) Ethernet LAN ports , 2 x 10G (RJ-45)using on board controller or AOC
Hi Speed Interconnect	Single Port based 100Gbps InfiniBand controller (for storage connectivity)
Graphics	On board Server Grade Graphics with dedicated graphics memory
Accelerator	1 x Computational GPU with double precision performance @ 9.5TFlops or more , on board GPU Memory : 40GB, supports creation of multi GPU instances >=7, must support OpenACC, OpenCL & CUDA, System should be able to support 2 double width A100 GPU cards from day one with required expansion slots and optimum power supplies. An external enclosure to house multiple GPUs if quoted must be supplied with the system from day one.
Exp. Slots	2 × PCIe (must be the latest generation supported with the CPU model offered) (x16) slots
Diagnostics	Thru LEDs for power on/off, HDD activity, Network activity, System Overheat
Compilers	GNU Toolchain Preloaded
OS	Latest version of Enterprise/CentOS/Ubuntu Linux Operating System 64 Bit or better
OS Compatibility	Red Hat/ SUSE and Microsoft Windows compatible server system (certification to be provided)
Regulatory Compliance	On Site Warranty on same business day support basis. OEM have not been black listed or banned or debarred or stopped from doing business by any govt organisation in the past. OEM with registered office/service support centre in India.
AI Frameworks Preloaded	AI Frameworks supported -1.CPU Optimised Tensor Flow 2.CPU Optimised Pytorch 3..CPU Optimised Theano 4. CPU Optimised Caffe 5.CPU Optimised Text2speech 6.CPU Optimised Mxnet 7.CPU Optimised CuDNN 8.Accelerator Optimised Tensor Flow 9.Accelerator Optimised Pytorch 10.Accelerator Optimised Theano 11.Accelerator Optimised Caffe 12.Accelerator Optimised Text2speech 13. Accelerator Optimised Mxnet 14. Accelerator Optimised CuDNN 15. Clara Deploy SDK or equivalent16.Deep vision AI17. BIGDFT 18. Parabricks or equivalent 19. R 20. Microsoft CNTK 21.Keras 22. Accord.NET 23.Spark Mlib 24. MLPack 25.Paddle Paddle 26. MKL 27. DNN

Containerization Support	Containerizing Different Framework Testing of Algorithms with container Building Customer Containers
Cloud Access License	System with Cloud Access License for pre compiled ML/DL frameworks must be provided for unlimited users. License to be issued in the name of RCB Faridabad, Datasheet must be attached
Management	Out of band Management Capabilities, Stack with a full IPMI implementation, Hardware Health monitor, Remote power control, Console Redirection HTML web Console Redirection.SMTP Support, Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles, LDAP Support, Windows Active Directory and Open LDAP support. Product datasheet must confirm the compliance. Support for Remote debug
Inference Deployment & Performance Tools	1. TensorRT 2. OpenVX 3. OpenCV 4. Kaldi 5. Kinetica
Scheduling Licensed Utility	Licensed based Unified system management/monitoring toolset for configuration, diagnosis and management of the system. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customize the node, And tool set with provisioning, monitoring, and reporting capabilities. With JOB scheduling capabilities on single node for CLI and GUI based end user applications. Commercial S/W utility can be either from the H/W OEM or a Commercial Licensed S/W from an ISV.
Ports	2 USB, 1 x Video, 2 x 10G (RJ-45), 1 x Management ports
Form Factor	Total rack space not more than 6U (including all enclosures with the system)
Accessories	32 inch monitor, mouse, keyboard & Laptop (i7, 16 GB RAM, 2 GB graphics card, 14' monitor, backlit keyboard, 1 TB SSD, Windows Professional) for remote monitoring of jobs
P. Supply Warranty	Redundant Power Supplies, with N+N redundancy configuration 80 Plus Platinum Rating or higher 3 Years Onsite Warranty

Item 2: System Management and other S/W Stack (quantity =1)

WORKLOAD MANAGER with Below Features

S.No	Description
1	Perpetual & floating S/W stack support for all nodes with warranty upgrade. Fully featured version with no limitation to no of jobs and scalability of nodes
2	Integrated advanced scheduling features including cross-system scheduling, peer to peer scheduling with advanced fair share & hierarchical fair share reservations, preemption, access control lists (ACLs), Role based access control and backfilling scheduling, multi-system scheduling, Meta-scheduling for job scheduling and management across distinct computational units
3	Power aware job scheduling to support auto shutdown and auto boot of node(s) as per the workload to be supported.
4	Topology-aware scheduling (both inter- and intra-node) to ensure maximum application performance while minimizing cross-job network contention;
5	Preemption and checkpointing (suspend/checkpoint/requeue) allow users to immediately run high-priority work
6	Plugin framework for custom health checking, mitigation, and notification capabilities including off-lining flaky nodes, restarting scheduling cycles and requeuing jobs
7	The Management Suite must offer Web/CLI based Job submission, monitoring, management and 3D remote visualization capability with secure access control which can be integrated with LDAP.
9	The system Management Suite must have Web based tool for administration of system including real time monitoring, historical repository based on jobs, users, application etc.
10	S/W offered must be licensed support backed, bidder or the ISV (back end arrangement with bidder) must provide end to end support for the same.
11	Operating System: Operating system should support Latest version of RHEL
12	Operating System is required
13	Resource Management/Job Scheduling Support is required

14	System Management S/W: Unified system management, monitoring toolset for configuration, diagnosis and management of the system, Node(s) manager with provisioning, monitoring and reporting capabilities Support Package and Image based provisioning Intuitive web interface to manage and customize the system Customizing networks and compute node profiles through GUI Customizing compute node (up to changing kernel parameter) Able to Push configuration changes and updates to the compute nodes without the need of reinstalling and rebooting
15	There should be software support for both serial and parallel environment.

Item 3: Technical Specifications for Linux Workstation are as below (quantity =3)

Processor(s)	1 x CPU (Intel Xeon Scalable x86 architecture based) each with minimum 16 Cores and operating a clock speed of 2.8GHz or higher clock speed and 1.35MB Cache per core or more. Scalable to dual processor configuration in future.
Accelerator	1 x Computational Graphics GPU with on board GPU Memory : 16GB, memory interface @ 256 bit , with 3000 + CUDA Cores, System must support two such accelerators from day one with required expansion slots and optimum power supplies
Chipset	Intel® C620 series Chipset or better
Management	Out of band Management Capabilities, Stack with a full IPMI implementation, Hardware Health monitor, Remote power control, Console Redirection HTML web Console Redirection.SMTP Support, Email Alerting methodology, User management functionality with SSL based security , Multi User Permission Levels, Multi User Profiles, LDAP Support, Windows Active Directory and Open LDAP support. Product datasheet must confirm the compliance. Support for Remote debug
RAM	128GB DDR4-2933 or higher ECC RDIMM/LRDIMM System scalable to 1024GB/768GB using 3DS LRDIMMs/ RDIMMs. at least 12 DIMMs available System must support Intel OPTANE modules as well .User may opt to replace current ECC DIMMs with Optane DCPIMM modules subsequently for in memory computation and storage support. DCPIMM support including appdirect and memory/persistent memory type usage.

RAID Controller	SATA RAID controller with RAID levels 0,1,10 or higher
HDD(s)/SSD	1 x 480GB SATA Enterprise Grade SSD
Storage Bays	5 or more Drive bays – for SATA HDDs and SSDs. Which includes at least 1 dedicated NVMe Bays or more.
NIC	2 x 1G (RJ-45/SFP+) Ethernet LAN ports using on board controller or AOC
Exp. Slots	3 PCI-E 3.0 x16 or more, 2x additional PCIe slots for AOCs (if some of the slots are usable only if 2nd CPU is populated then that's acceptable)
Diagnostics	Thru LEDs for power on/off, HDD activity, Network activity, System Overheat
Utility	Licensed based Unified system management/monitoring toolset for configuration, diagnosis and management of the system. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customize the node, And tool set with provisioning, monitoring, and reporting capabilities. With JOB scheduling capabilities on single node for CLI and GUI based end user applications. Commercial S/W utility must be only from the H/W OEM .
Compilers	GNU Toolchain Preloaded
OS	Enterprise Linux Operating System 64 Bit or better pre-loaded
OS Cert	Red Hat/ SUSE and Microsoft Windows certified system (certification for both must be submitted with the bid)
Regulatory Compliance	BIS Registered and Certified OEM Product On Site Warranty on same business day support basis from the OEM.
Containerization Support	Containerizing Different Framework Testing of Algorithms with container Building Customer Containers. OEM Utility for the same must be preloaded with system from day one. Datasheet for the same must be provided with technical bid
Ports	2 USB, 1 x Video, 2 x 1G (RJ-45/SFP+), 2 x 10G (RJ-45/SFP+), 1 x Management ports
Form Factor	Tower or Rack Mount Capable system with not more than 4U rack space required Including JBOD if any)
Display	1 x 27" (68- 71 cm) ,3840 x 2160 resolution, IPS panel, TCO-7 , Height Adjustable, 99% sRGB Colour Gamut Monitor
Power Supply	Less than 1400W per power module, 80 Plus Certified Power supply
Warranty	3 Years Onsite Warranty