NATIONAL CENTRE FOR SUSTAINABLE COASTAL MANAGEMENT
Ministry of Environment and Forests (MoEF)
Koodal Building, Anna University Campus
Chennai – 600025

Specification for HPC Cluster

Supply, Installation, testing, commissioning and training for HPC Cluster (Master & Compute Nodes) 3year warranty

Sl. No.	Technical Specification	
	HPC Cluster	
	Master Node with accessories:	**Quantity**
1	Intel Xeon E5-2600 Series with 3.0GHz 10Cores or AMD Opteron 6300 Series with 2.8 GHz 12Cores or Higher 128GB (8x16GB) 2Rx4 L DDR3-1600 R ECC or higher 6 x 900GB 10K RPM SAS Disks, Hardware RAID with support for 0, 1 and 5 or Higher Four Gigabit Ethernet ports with PXE boot capability. One 4x FDR 56Gbps Infiniband HCA compatible with the quoted Infiniband switch DVD-RW drive, IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. Redundant and Hot Pluggable power supply. OS Combatiability with RHEL5.x, RHEL6.x, SUSE Linux, Ubuntu and Centos Operating system. 2U or better form factor. 80 Plus or better certified power supply. Power cables of IEC C13 type compatible with the quoted rack. Fan upgrade kit hot-plug redundancy Cable powercord rack, 4m, grey	1

	Compute Node:	**Quantity**
2	Intel Xeon E5-2600 Series with 3.0GHz 10Cores or AMD Opteron 6300 Series with 2.8 GHz 12Cores or Higher 128GB (8x16GB) 2Rx4 L DDR3-1600 R ECC or higher 2 x 1TB SATA HDDs, with support for RAID 0 & 1 IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features. Four Gigabit Ethernet ports with PXE boot capability. 56Gbps 4X FDR Infiniband HCA card Compatible with Quoted Infiniband switch 2 x16 PCI-E Gen3 slots for Intel Xeon Phi Card, Two numbers of Intel Xeon Phi Coprocessors 5110P or equivalent. Fully certified with RHEL5.x, RHEL6.x, SUSE, Ubuntu and CentOS Linux Operating system. 80 Plus or better certified power supply. Power cables of IEC C13 type compatible with the quoted rack. Fan upgrade kit hot-plug redundancy Cable powercord rack, 4m, grey 2U or better form factor.	4
	42U Closed Server Rack with Accessories:	**Quantity**
3	42U Closed server rack with high density cooling integrated into the rack enclosure with following specifications : • Integrated high density cooling with horizontal air flow for even cooling • Automatic back-up ventilation • Capable of Air-cooled and Water-cooled systems • Remote monitoring and Smart controls are a nice to have feature (Optional)	1
	Primary Communication Network:	**Quantity**
4	18 Port 56Gbps 4X FDR Infiniband Switch or higher, Support for OFED, iSER, SDP, IPoIB, RDMA & uDAPL Suitable management software to manage the switch. Redundant power supply along with the power cables. QSFP Infiniband Cables compatible with the quoted HCA cards in servers. 15 Numbers (7 Nos. of One Mtr. 8 Nos. of Three Mtr.) Power cables of IEC C13 type compatible with the quoted rack.	1
	Secondary Communication Network:	**Quantity**
5	16 ports, L2 Gigabit Ethernet switch Port trunking capability High speed stacking capability Cat6 Cables: 20 numbers of 3m cables, 15 numbers of 2m cables, Power cables of IEC C13 type compatible with the quoted rack. Rack mounting kit	1
	Cluster Management Network:	**Quantity**

6	16 ports, Fast/Gigabit Ethernet switch Power cables of IEC C13 type compatible with the quoted rack. Rack mounting kit	1
7	**KVM Monitor & KVM Switch**	**Quantity**
	19" Rackmount KVM Monitors (Connected with all Nodes) 8 Port KVM Switch Rack Mountable	1
8	**Training**	
	The vendor should give training in two sessions (Pre-Installation & Post Installation) to a group of NCSCM personnel on hardware, operating system, system software and development tools including API. The training must be arranged at NCSCM, Chennai.	
9	**Software:**	
	Cent OS Operating System, C & Fortran Compiler, Math Libraries. Vendor specific Infiniband stack on Linux OS, if available, should be supplied. Vendor specific MPI implementation on Linux OS, if available, including MPI over IB and IpoIB, should be supplied. Scheduler – Scheduler proposed should be compatible with proposed infrastructure and fully supported by bidder. Enhanced scheduler (PBS pro or LSF) as options. (Scheduler should have the following minimum capabilities: it should support scheduling policies, dynamic priorities, reservations and fairshare capabilities).	
10	**Cluster Management Tool features:**	
	Cluster Management (Add, Modify, Delete Compute Nodes) with GUI Based(Web) Profile based compute node, storage node provisioning Fully automated system provisioning Managed Services from cluster tool (DNS, DHCP, NIS etc.) GUI (Web) Monitoring Cluster tool must support various flavor of Linux OS Redhat, Cent OS, SuSe Linux Power Management support Configuration Automation (installation of Application in compute node thru Cluster Management Tool) Parallel command execution GUI display of Cluster Hardware & Software configuration Cluster Tool must support Master Node HA	

	Benchmarking	
11	Demonstration of HPL Benchmark performance atleast 80%	
	Warranty, Technical Support and Documentation	
12	**Cluster management and support for 1 year** **Hardware Warranty for 3 years** One skilled L2 or L3 level trained personnel should be available to help at any time either remotely or in person. A helpdesk email account which is regularly monitored should be available to the users. An escalation matrix for issues not resolved by the support personnel, with an expected time line, should be clearly mentioned. The person should have enough experience to handle cluster hardware and software troubleshooting to resolve the problems faced by the users. This should include fine tuning of the scheduler's various capabilities. The person should be able to produce required status report of the cluster when asked using the software installed in the cluster to manage it. When handing over the cluster the vendor should provide the full design of the cluster installation including the electric connections, network connections, user manual clearly explaining how to use the cluster.	