		1. Specification for Master Node
Sr. No.	**Features**	**Description**
Server Specification		
1	Processor Type	64 bit processor or latest generation
2	No of Processor	2 x 10 Cores 2.9Ghz or higher
3	Threads	The complete system should have 320 threads (master + compute nodes) or, the system should provide minimum 1 Tera Flop sustained speed or above.
4	Memory (RAM)	System should be equipped with at least 256 GB memory with Expandability to 1024GB RAM
5	Cache Memory	Minimum Cache should be 2.5 MB per core or above
6	System Memory Bandwidth (GB/s)	System should support total memory bandwidth of 85GB/socket or above
7	Internal Hard Disk Capacity	2 x 1 TB SATA/ SAS Disks with RAID1
8	Bus technology	PCIe Gen3 or higher
9	GPU Support	System should support Nvidia Tesla GPU for Computing
10	I/O Slots	Minimum 5 PCIe hot plug Gen3 slots
11	Infiniband Port	EDR 100 GbPS inifniband port
12	Storage Adaptor	16Gb Dual port FCAL HBA adaptor
13	Ethernet Port	1 Gbps Ethernet 4 ports
14	Power supply	2 x 900W Power supply or above and Redundant Cooling fan/subsystems
15	Operating System	RHEL
16	Form factor/Node Type	1U/ 2U 19- inch wide Rack Mountable with rail kit
17	Graphics	On-board graphics using Server Grade Graphics Controller
18	Ports	2 USB, 1 x Management
19	FC port	2 x 16 GB FC port
20	Peripherals	18.5" TFT Color Monitor, Keyboard & Optical Mouse
21	Warranty	At least 3 years + 2 years AMC on site

2. Specification for Compute Node

Sr. No.	Features	Description
Server Specification		
1	Processor Type	64 Bit, Processor or latest generation
2	No of Processor	2 x 10 Cores 2.9Ghz or higher
3	Memory (RAM)	System should be equipped with at least 256 GB memory with Expandability to 1024GB RAM
4	Cache Memory	Minimum Cache should be 2.5 MB per core or above
5	System Memory Bandwidth (GB/s)	System should support total memory bandwidth of 115GB/socket
6	Internal Hard Disk Capacity	2 x 1 TB SATA/ SAS Disks
7	Bus technology	PCIe Gen3
8	GPU Support	System should support Nvidia Tesla GPU for Computing
9	I/O Slots	5 PCIe hot plug Gen3 slots
10	Infiniband Port	EDR 100 GbPS inifniband port
11	Ethernet Port	1 GbPS Ethernet 4 ports
12	Power supply	2 x 900W Power supply or above and Redundant Cooling fan/subsystems
13	Operating System	Fully certified/compatible with latest RHEL 7.x
14	Form factor/Node Type	1U/ 2U 19- inch wide Rack Mountable with rail kit
15	Warranty	At least 3 years + 2 years AMC on site

3. Specification for SAN storage

Sr. No.	Features	description
1	Hardware RAID controller	Dual Active Controller with no single point of failure in the storage array
2	Cache	1)The Storage subsystem shall be configured with minimum of 16 GB usable cache 2)It shall support de-staging of cache to disks on power down or shall support internal battery backup of cache for at least 48 hours. The data in cache shall not be lost in the case of power failure.
3	Host Interface	1) Storage system should be configured with 8 numbers of 16 Gbps FC, front-end ports.
4	Drive Interface	Storage should support at least 2 numbers of ports with 12 Gbps or higher SAS for connectivity to disk drives.

5	Support Drives	The storage subsystem shall support 300/450 /600 GB/900GB FC /SAS disk and 2 TB or higher SATA/FATA /Nearline disk drives.
		Storage should support SSD drive. The storage shall also support the functionality to automatically move the data from lower performing disk to SSD, based on the performance requirement. Required licenses for the same shall be provided.
6	Hardware RAID Levels	0,1,5,6,10
7	San Supported	All Standard SAN Switch needs to be supported.
8	Disk Scalability	The storage should be configured with 12 x 8TB 7.2K RPM HDD. The storage should be scalable to at least 240 drives.
9	Availability	1)Should offer dual active-active and failover controllers Should offer redundant power supplies and cooling units Should support hardware based RAID 0, 1, 5 and 10 Should support LUN Masking and software for the same should be configured
		2)It should support Non-disruptive component replacement of controllers, disk drives, cache, power supply, fan subsystem etc.
		System should be quoted from OEM listed in MAGIC Quadrant.
		The storage shall support the following High Availability Clusters solution from HP, IBM, Symantec, EMC , SUN and Windows
10	Licensing	Licenses for software (Storage Array Management, Point-in Time Copy/ snap shot, Volume Copy, multipathing software for host) should be provide as part of the solution
		System should be configured with necessary multipathing components for high availability
		Required licenses for Snapshots/clones should be configured.
11	Management	The storage system shall be configured with GUI based management software as below: •Monitor and manage the storage array •Configuring PIT's •LUN management. •Storage Component replacement, etc.
12	Operating System Support	The storage system shall support the latest OS releases & Cluster of the following mentioned servers / OS:- CISC/RISC/EPIC-based Servers running Microsoft, HP, IBM, Sun, Linux
13	Power Supply	Min 900W or above, 1+1 redundant, hot-plug power supplies

4. Hi Speed Interconnect Switch based on 100GBps Connectivity (Non-Blocking) Qty:	
Ports	At least 24 (100 GBps) Hi speed interconnect ports
Cables	Interconnect switch must be supplied with required cables of sufficient length
Accessories	Required accessories must also be supplied with the switch
Power Supply	Dual-redundant power supplies within built redundancy
Communication and Management	24 port Gigabit Ethernet Switch for communication and management with cables

5. 42U Rack	Qty: 1
42U server rack, front and backdoor should be maximum perforated for heat dissipation with required number of PDUs, cable managers, keyboard tray and all other required accessories	

6. Training	
Installation & Training by Certified Professionals as required	

7 . Software & Installation (Components Include)	
OS	Enterprise Linux (RHEL)
Job Schedulers	
Commercially licensed software only should be quoted (Support should be provided by Server OEM only)	1. Workload cum resource manager with policy-aware, resource-aware and topology-aware scheduling
	2. Advance reservation support
	3. Support of job submission through CLI, Web-services and APIs
	4. Heterogeneous cluster support
	5. Multi-cluster support

	6. Preemptive and backfill scheduling support
Job Schedulers	7.Application integration support
Commercially licensed software only should be quoted	8. Live reconfiguration capability
	9. SLA/Equivalent
	10. GPU Aware scheduling
	11. Intuitive web interface to submit and monitor jobs
MPI	Open MPI, MVAPICH (community)
Libraries	Open Source Libraries for C, C++ & FORTRAN, MPI, MKL, Optimized Blas 1,2,3, Lapack, Scalapack etc.
Resource Management	Torque or supported resource manager from OEM
Cluster Management	The cluster management stack with a web based monitoring for all the cluster nodes.
Cluster monitoring and management software with the following features, Commercially licensed software only should be quoted	1. Cluster manager with provisioning, monitoring and reporting capabilities
Commercially licensed software only should be quoted	2. Support Package and Image based provisioning
	3. Intuitive web interface to manage and customize the cluster
	4. Linux based cluster manager
	5. Customizing networks and compute node profiles through GUI
	6. Customizing compute nodes to max, upto changing kernel parameter
	7. Able to Push configuration changes and updates to the compute nodes without reinstalling and rebooting

The bidder should provide support in installing and running recent versions of weather and climate models (i.e., WRF, RegCM, MPAS, etc.).