

High Performance Computing

CIRM, NBU





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THE CLUSTER

The NBU cluster is configured with one Head node and storage Node and twenty-eight of Compute Node with 150 TB Storage Space. All compute nodes and head node are connected with Infiniband PDR cluster interconnects with 100GB bandwidth for each node and head node.

HARDWARE INFRASTRUCTURE

Head Node

20 nos. of IBM Power8 core / 8 Thread
per core 2 x 1TB HDD
Infiniband PDR Cluster Inter
Connect. 512 GB RAM
4-port 1 GiG Ethernet

Compute Node

20 nos of IBM Power8 core / 8 Thread
per core 2 x 1TB Storage Space
Infiniband PDR Cluster Inter
Connect. 512 GB RAM
4-port 1 GiG Ethernet

All head node and compute node is connected with Mellanox Infiniband switch.



SOFTWARE STACK

- The Operating System installed in Master Node to configure the Cluster is Power Edition Cent OS 7.2.
- IBM Spectrum Cluster Foundation community Edition with xCAT(Xtream Cluster Administration tool) has been used for HPC management software .
- IBM Spectrum Cluster Foundation community Edition with xCAT has been installed in Master node for HPC Management. The entire compute node has been installed as compute node appliance by kick start process from Head Node with PXE boot process through network.
- All cluster storages are mounted on /home file system which is exported through NFS and mounted to all nodes as Cluster storage.
- All compute node has been implemented with 1 TB free space for scratch directory for users. Name of the cluster is MASTER.
- The head node name is master.nbu.ac.in.



MONITORING

IBM Spectrum cluster monitoring is available for gui through web browser and xCAT command line option also available for monitoring.

JOB SUBMITTING AND SCHEDULING

Open Source SLURM has been implemented for PBS job submitting and scheduling. Master Node has been configured as admin and submit host. All compute node has been configured as execute node. Job need to submitted through Master node only. computationally-intensive processes run on the login node will be killed without warning.

PARALLEL ENGINE

Open MPI 2.2 has been implemented as Default MPI parallel Engine. Other MPI as mpich, mpich2 and mvapich2 has been also implanted. Binary Path needs to be given to compile with this mpi and the excusable needs to run from exact path.

AUTHENTICATION AND SECURITY

For the cluster, user must authenticate and run computational jobs. The format is available at <https://nbu.ac.in/doc/qls/HPCRegistrationForm.pdf> For security reasons, as soon as you have received your credentials for a system, you should login and change your password.



ACCESSING THE CLUSTER

Accessing the Cluster at NBU Campus

The cluster is accessible from any computer system connected to the NBU network through LAN / Wireless / VPN with the help of ssh client.

Accessing the Cluster from outside of NBU Campus Network

NBU HPC can be accessed outside of NBU Campus Network, from any geographies, via VPN. Users are requested to follow the instructions given at <https://nbu.ac.in/qls/remoteAccess.aspx>



FILE TRANSFER

It is likely that you will wish to upload files to the HPC system, or download them to your desktop/laptop. Linux users can do this by using the OpenSSH utilities suite like WinSCP.

