CASE STUDY

HIGH PERFORMANCE COMPUTING

For Oceanographic research, NIO uses many computational and simulation applications such as NEMO, WRF, MOM4 codes. All these applications are Computational and memory intensive. It demands huge CPU and memory capacity for each of the jobs. NIO scientists need to perform multiple iterations of these jobs to arrive at the end results which could be useful for their Oceanographic research. Earlier, they used to run most of these applications on the individual workstations. The execution of these jobs used take long time and used to have frequent rum time failures

Also, individual workstations means separate resources, no collaborative efforts and long queue of the jobs and long wait till the existing jobs are finished. This leads to delays in Research Activities and oceanographic predictions.

Concept Team approached NIO scientists with solutions for these problems faced by NIO. Researchers at NIO sensitized us with their pain areas and challenges. We requested them to share few of the jobs of different applications so that they could be assessed about their compatibility for parallel processing on the HPC set up. These jobs went through test run at HP's HPC Lab and benchmarked on various sizes of HPC. Based on the sizes of the jobs and their volume, the size of the required HPC was designed as 32 node HPC system with Mellonox FDR Infiniband interconnect. Since NIO being the research organization, Open Source software was the obvious choice for the users.

NIO has to follow tender process for their procurement. Concept offered the best prices and got the order form NIO to supply HPC system with NFS storage of HP make. The HPC system includes:

- Compute nodes HP SL6500 High density servers with 2xIntel E5-2600 Xeon 8C– 32 Nos.
- Master Node - HP DL380 Server
- Interconnect : Mellonox 36 ports FDR Infiniband Switch
- NFS Storage : HP EVA6350 storage
- HP Cluster Management Utility software
- Open source CENT OS, Open PBS, MPI Libraries and Compilers.

Concept managed to complete the installation in next 7 days of time after loading few of the Oceanographic applications on this HPC system. NIO Researchers are able to use this system to its fullest capacity extent now. They are running various jobs in different applications in 24x7 run on the HPC compute nodes. They could vastly cut the long run time of the jobs and getting the results in almost 1/20 of the time. Recently NIO upgraded their NFS storage to accommodate large sizes of the output files of the executed jobs.

Concept is proud of its technical knowhow in HPC domain and count NIO as one of the prestigious Institute in our list of satisfied HPC customers in India.

Solutions
10TF HPC system with 30 TB NFS Storage