

High Performance Computing (HPC) facilities at IIT Guwahati

Existing facility: Param-Ishan

Param-Ishan, the High Performance Computing (HPC) facility at IIT Guwahati, was installed on September 19, 2016. It is a part of the National Supercomputing Mission which was started in India by the Indian government since last couple of decades to bring the research performed in the Indian institutes in the league of those performed in the top universities of the world. Param-Ishan was inaugurated by then the Human Resource Development minister honourable Shri Prakash Javedakar. The facility has been setup as a part of the joint project between IIT Guwahati and Center for Development of Advance Computing (C-DAC), Pune.

It is one of the premiere facilities in India with a computing capacity of 250 Teraflops and equipped with 300 TB storage. It was installed at IIT Guwahati with the aim to boost both quality and volume of research activities of the Institute. The cluster consists of computing nodes connected through the high speed infiniband FDR network. It has 162 computing nodes having a total of 3888 CPU cores. It also has the 16 GPU nodes with configuration 2 NVIDIA Tesla k40c per node and 16 nodes with Intel PHI coprocessors for high speed calculations.

Since its inception, the facility has widely been used across the departments and centres, thus becoming an important ingredient in facilitating the world class research outputs from the Institute. This facility is also being used by researchers and faculty members from various other institutes like Cotton University, IASST Guwahati, CSIR -Central Food Technological Research Institute, Mysore etc. In addition, 5 sponsored projects granted under National Supercomputing Mission is also executing in this cluster.



Research activities carried out using this facility includes Molecular Dynamics simulation, Fluid turbulence, Quantum optics, Electronic structure of the material, Drug Discovery, Computational Biology, Computational Chemistry, Bio-oil production and upgrading, Computational Genomics, Machine Learning, Natural Language Processing etc. Various licensed and open source software are installed in the cluster to support the computational need of the diverse research activities. Some of the major installed software are Intel Parallel Studio, Ansys, Gaussian, AMBER, Matlab, Tensorflow, Gromacs, NAMD, WRF, Orca, LAMMPS, COMSOL, Quantum espresso, VASP etc.

Upcoming facility: Param-Kamrupa

Param-Kamrupa is a 838 Teraflops with 1 PB storage, High Performance Computing cluster which is being installed at IIT Guwahati. This facility is also set up as a joint project between IIT Guwahati and CDAC. This cluster will have 146 CPU-only computing nodes, 10 GPU nodes with 2 NVIDIA V100 GPU cards per node. This system has the flexibility to add another 64 GPU cards if needed in future. This facility will provide a major boost to High Performance Computing at IIT Guwahati.