

Abstract

Phase II Project Proposal for Joint Collaborative Research Activities on Computational Aspects of Numerical Weather Prediction(NWP) at NCMRWF, Noida and C-DAC, Pune

Organization: NCMRWF, Noida and HPCS Group, C-DAC, Pune

NCMRWF under MoES having scientific domain expertise (problem identification and analysis, algorithm development) and C-DAC under DeitY, MCIT having expertise in computing (software and tools development, hardware installation) have collaborated on Computational aspects of NWP through joint research.

Objectives of the Project

- Collaborative research work on implementation of global weather model codes on open source Linux Cluster.
- Integrating weather applications with indigenously developed C-DAC HPC Resource Management Engine (CHReME).
- Exploring HPC for weather models with General-Purpose computation on Graphics Processing Units (GPGPUs).

Activities Completed:

- Porting and Execution of following three CUDA enabled modules of WRF Model on GPGPU platform:
 - 1) WRF Single Moment 5 Cloud Microphysics kernel
 - 2) WRF Fifth Order Positive Definite Tracer Advection kernel
 - 3) WRF-Chem KPP-generated Chemical-kinetics Solver kernel
- Porting and Benchmarking of Unified Model on x86_64 based Linux Cluster
- Development of scripts to automate disk management, System utilization and Security of HPC system
- System Administration for existing PARAM PADMA Storage, PARAM VAYU HPC Facility & Storage.