Contribution ID: **26**   Type: **30 minute oral presentation**

An Update of CMA HPC System

Thursday, 27 September 2018 10:30 (30 minutes)

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CMA HPCS provides reliable HPC resources and high performance computing services for weather and climate applications, generating millions of meteorological data products daily. Now there are two systems including "PI-Sugon"and IBM Flex P460. The new HPC of CMA -" PI-Sugon" system has the peak performance over 8 PFLOPS, with a total physical storage capacity over 20 PB. The architecture includes common CPU computing nodes, GPU and Knights Landing (KNL) nodes. The average CPU utilization of "PI-Sugon " subsystem 1 is above 60% within a few months after online. IBM Flex P460 system consists of two identical national subsystems and another 7 regional subsystems, which provides a total peak performance of 1.7 PFLOPS with 6.7PB physical storage capacity. The average CPU utilization of the IBM Flex P460 operational subsystem is 73% while the research subsystem is 80%. The CMA HPCS provides resources for GRAPES (Global and Regional Assimilation Prediction System) and BCC_CSM (Beijing Climate Center Climate System Model). Besides, it provides research services for dozens of models.

The accurate resource management system and the monitoring system provide efficient management of HPCS resources, and the stable operational environment and job scheduling system support model running and R&D. The model version management system provides standardized code management and cooperation service for model R&D based on HPCS. The GRAPES integrated-setting experiment tool (GISET) is a GUI for experiment construction and running of model R&D.

In order to explore the applicability of the meteorological numerical model on the multicore platform, CMA has been carrying out the program porting and optimization for GRAPES and BCC_AGCM (Beijing Climate Center Atmospheric General Model) on "Sunway TaihuLight",GPU and KNL platforms.

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Track Classification: 18th Workshop on high performance computing in meteorology