Building a High Performance Computing Infrastructure for Novosibirsk Scientific Center

Content:
Novosibirsk Scientific Center (NSC), also known worldwide as Akademgorodok, is one of the largest Russian scientific centers hosting Novosibirsk State University (NSU) and more than 35 research organizations of the Siberian Branch of Russian Academy of Sciences including Budker Institute of Nuclear Physics (BINP), Institute of Computational Technologies, Institute of Computational Mathematics and Mathematical Geophysics (ICM), Institute of Cytology and Genetics, Trofimuk Institute of Petroleum Geology and Geophysics.

Since each institute has specific requirements on the architecture of the computing farms involved in its research field, currently we’ve got several computing facilities hosted by NSC institutes, each optimized for the particular set of tasks, of which the largest are the NSU Supercomputer Center, Siberian Supercomputer Center (ICM) and a Grid Computing Facility of BINP. Recently a dedicated optical network with the initial bandwidth of 10 Gbps connecting these three facilities was built in order to make it possible to share the computing resources among the research communities of participating institutes, thus increasing the efficiency of operating the existing computing facilities, providing mechanisms for transferring large amounts of data and offering the common platform for building the computing infrastructure for future scientific projects. Unification of the computing infrastructure is achieved by extensive use of virtualization technologies based on both XEN and VMware platforms.

This contribution gives a thorough review of the present status and future prospects for building and supporting the infrastructure of NSC supercomputer network and the ongoing computing farm integration activities performed by the institutes involved in the project.

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