Contribution ID: **188** Type: **Plenary reports**

IT solutions for JINR tasks on the "Govorun" supercomputer

Thursday, 8 July 2021 11:45 (45 minutes)

The "Govorun"supercomputer is a heterogeneous computing system that contains computing architectures of different types, including graphics accelerators. The given architecture of the supercomputer allows users to choose optimal computing facilities for solving their tasks.
To enhance the efficiency of solving user tasks, as well as to expand the efficiency of utilizing both the computing resources and data processing and storage resources, a number of special IT solutions were implemented on the "Govorun"supercomputer. A hierarchical hyper-converged data processing and storage system with a software-defined architecture is referred to the first type of IT solutions. The implementation of this system is caused by the fact that modern supercomputers are used not only as traditional computing environments for carrying out massively parallel calculations, but also as systems for Big Data analysis and artificial intelligence tasks that arise in different scientific and applied tasks. According to the speed of accessing data, the system is divided into layers that are available for the user's choice. Each layer of the developed data storage system can be used both independently and as part of data processing workflows. The second type of IT solutions lies in resource orchestration, which means that computational elements (CPU cores and graphics accelerators) and data storage elements (SSDs) form independent computing and data storage fields. Due to it, the user can allocate for his task the required number and type of compute nodes (including the required number of graphics accelerators), as well as the required volume and type of data storage systems.
The implementation of the above technologies made it possible to perform a number of complex resource-intensive calculations in the field of lattice quantum chromodynamics to study the properties of hadronic matter at high energy density and baryon charge and in the presence of supramaximal electromagnetic fields, to qualitatively increase the efficiency of modeling the dynamics of collisions of relativistic heavy ions, to speed up the process of event generation and reconstruction for conducting experiments within the NICA megaproject implementation, to carry out computations of the radiation safety of JINR experimental facilities, to significantly accelerate studies in the field of radiation biology and other applied tasks solved at JINR at the level of international scientific cooperation.

The studies in this direction were supported by the RFBR special grant ("Megascience –NICA"), No. 18-02-40101.

Summary

Primary authors: PODGAINY, Dmitry (JINR); STRIZH, Tatiana (JINR); ZUEV, Maxim (JINR)

Presenter: ZUEV, Maxim (JINR)

Session Classification: Plenary reports