Contribution ID: **328**   Type: **not specified**

Coscheduling tasks in computer network using lightweight virtualization

Thursday, 6 July 2023 15:30 (15 minutes)

One of the promising areas in the field of high-performance computations is co-scheduling, which allows to schedule computational tasks with the possibility of coexecution on a single node. The common approach of running one task on each node simultaneously does not allow to utilize the resources of the computer network to the full extent. With usage of co-scheduling mechanism it is possible to increase efficiency of HPC system overall as well as to reduce its energy consumption.

In this work several tasks are completed. First of all, several scheduling strategies for computational tasks execution, which can work on arbitrary number of nodes, are introduced. Secondly, a scheduler and proposed strategies are implemented using Docker containerization mechanism and Scala programming language. Thirdly, a computational experiment is performed in order to compare efficiency of strategies. In the experiment strategies' execution time is measured on different combinations of tasks from well-known NASA Parallel Benchmarks (NPB) set.

The results of the computational experiment show that one of the proposed strategies is working better than the trivial one under some assumptions. Further development of this strategy and the scheduler may make this strategy better than the trivial one overall.

Summary

Primary authors: EGOROV, Aleksandr (Saint Petersburg State University); KORKHOV, Vladimir (St. Petersburg State University)

Presenter: EGOROV, Aleksandr (Saint Petersburg State University)

Session Classification: Student section