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Simulation Model of an HPC System for Super Charm-Tau Factory

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This work describes the design of a digital model of an HPC system for processing data from the Super Charm-Tau factory electron-positron collider of the "megascience" class. This model is developed using the AGNES multiagent modeling platform. The model includes intelligent agents that mimic the behavior of the main subsystems of the supercomputer, such as a task scheduler, computing clusters, data storage system, etc. Using simulation modeling allows for the maximally reliable representation of the exact characteristics and volume of the needed equipment for developing the desired HPC system. The simulation model accounts for all the aspects of operation of this system from parallel data storage system to arrangement of the parallel launch of tasks. The developed system for processing software errors and equipment failures, as well as the system for ensuring energy efficiency make it possible to estimate the needed equipment with account for all possible emergency situations. This model allows calculating the parameters of the computing system necessary for processing and storing the results of operation of the Super Charm-Tau factory after its commissioning.

Summary

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