



Contribution ID: 472

Type: Sectional talk

Digital twins of distributed data acquisition, storage and processing centers: status and prospects

Thursday 10 July 2025 15:45 (15 minutes)

Digital twins (DT) of distributed data acquisition, storage and processing centers (DDC) can be used to improve the technical characteristics of computing systems, make decisions on the choice of equipment configurations as part of the task of scaling and resource management. The report discusses a method for creating and using DDC digital twins. A distinctive feature of the method is the ability to model data processing and storage, taking into account the characteristics of data flows and job flows, the probabilities of failures and changes in the equipment performance. A software package has been developed based on the method. Verification and experimental operation of the software package was carried out during the creating DT for computing infrastructures for acquisition, storing and processing experimental data in the field of high-energy physics. In the future, it is planned to improve the developed method and add a multi-criteria optimization function when choosing an equipment configuration. As criteria, both more detailed technical parameters and cost parameters of the equipment included in the DDC will have to be taken into account. The web service for user interaction with the DT will be upgraded to improve the user-friendliness of the software package. The results of the work will make it possible to expand the functionality of using the software package in the tasks of designing, creating, supporting and developing DDCs for large scientific projects.

Author: PRIAKHINA, Daria (JINR, MLIT)

Co-authors: КОПЕНЬКОВ, Владимир (JINR); ТРОФИМОВ, Владимир (JINR)

Presenter: PRIAKHINA, Daria (JINR, MLIT)

Session Classification: Computing for MegaScience Projects