Contribution ID: **63**   Type: **not specified**

MarmotGraph @ CSCS - A knowledge graph for linked HPC data

Friday 4 April 2025 10:15 (20 minutes)

A High-Performance Computing (HPC) center typically consists of various domains. From the physical world (hardware, power supplies, etc.) up to highly abstracted and virtualized, dynamic execution environments (cloud infrastructures, software, and service dependencies, central services, etc.). The tools used to manage those different domains are as heterogeneous as the domains themselves. Accordingly, information on how the different layers are designed, set up, and interconnected is spread across various systems, databases, and persons within the organization. Keeping the information consistent across the domain specific tools and gaining an overarching representation of the center is a huge challenge.

At CSCS, we're trying to approach this issue by introducing a central knowledge graph. Within the European research project "EBRAINS 2.0" (successor of the "Human Brain Project"), we're already developing and operating a knowledge graph solution. Whilst this solution has proven its capabilities in a neuroscientific context for more than 6 years, we're now extending it for this new use-case by integrating multi-tenancy capabilities and preparing it to become a generally applicable product under the name of "MarmotGraph". By extracting information from various existing tools in the HPC center and applying them to a common linked metadata model, we can not only make information more accessible to the whole organization but also detect inconsistencies or delays in eventually consistent data states.

In this session, we will present the current state of the development of our solution as well as the designed model, and discuss the challenges, chances, and risks involved with the implementation of a centralized knowledge management system such as the MarmotGraph.

Desired slot length

20

Speaker release

Yes

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Session Classification: Software and Services for Operation

Track Classification: Software and Services for Operation