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Fully containerised approach for the HPC cluster at FAIR

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The scientific program of the future FAIR accelerator covers a broad spectrum of topics in modern nuclear and atomic physics. This diversity leads to a multitude of use cases and workflows for the analysis of experimental data and simulations. To meet the needs of such a diverse user group, a flexible and transparent High-Performance Computing (HPC) system is required to accommodate all FAIR experiments and users.

In this presentation, we present an operational approach for the computing cluster at GSI/FAIR that is characterized by an exceptionally minimal host system. This is achieved by installing and running all user applications in containers. Our successful implementation of this approach on a production system hosting approximately 700 users, 80,000 CPUs and 400 GPUs demonstrates its feasibility and scalability.

We present a transparent solution for interactive work in a containerized environment that addresses different levels of user experience. In addition, users have the opportunity to construct and submit their own containers. The presentation will cover also how usage of Spack and CVMFS contributes to the overall efficiency and adaptability of the computing cluster at GSI/FAIR.

Significance

References

Experiment context, if any

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