Beitrag ID: **17** Typ: **nicht angegeben**

xSDK: an Ecosystem of Interoperable Independently Developed Math Libraries

Freitag, 28. Oktober 2022 09:00 (45 Minuten)

The development of emerging extreme-scale architectures with higher performance potential provides developers of application codes, including multiphysics modeling, and the coupling of simulations and data analytics, unprecedented resources for larger simulations achieving more accurate solutions than ever before. Achieving high performance on these new heterogeneous architectures requires expertise knowledge. To meet these challenges in a timely fashion and make the best use of these capabilities requires a variety of mathematical libraries that are developed by diverse independent teams throughout the HPC community. It is not sufficient for these libraries to individually deliver high performance on these architectures, but they also need to work well when built and used in combination within the application. The extreme-scale scientific software development kit (xSDK) provides infrastructure for and interoperability of a collection of more than twenty related and complementary numerical libraries to support rapid and efficient development of high-quality applications.

This presentation will summarize the elements that are needed to make the xSDK an effective ecosystem of interoperable math libraries that can be built on top of large application codes. We will also discuss efforts to provide performance portability and sustainability, including xSDK testing strategies.

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Sitzung Einordnung: Invited Talks