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Christian Trott is a High Performance Computing expert at Sandia National Laboratories, where he co-leads the Kokkos core team, developing performance portability solutions for engineering and science applications. He heads Sandia's delegation to the ISO C++ committee and is a principal author of features like `mdspan` and linear algebra. Recently, he helped establish the High Performance Software Foundation and serves on its governing board. Before joining Sandia, Christian earned a doctorate in theoretical physics from the University of Technology Ilmenau.

Abstract:

Open Source or Bust: The future of HPC libraries is collaborative!

For a long time HPC software was characterized by small teams reinventing the wheel at every institution.

Incentives, such as being evaluated by paper output and the hurdles to obtaining funding, favored creating your own project, instead of marginally improving an existing one. Over the last 10 years the downsides of this approach have started to grow to insurmountable heights.

Hardware diversity and the complexity of modern computational problems makes it in many cases prohibitively expensive to start projects from scratch.

The answer to these challenges is a shift towards collaboration: developing and maintaining key HPC software projects together and reusing them across wider user bases.

But building successful long-term collaborations isn't an easy feat, and it does take a significant amount of know-how in addition to resources.

The High Performance Software Foundation (HPSF) is here to help. Created as a home for key HPC software projects, it provides a neutral ground for organizing multi-institutional collaborations, and brings together project communities to grow stronger. In this talk I will provide insights into a successful transition of a single institutional project to a community project. Using Kokkos as an example I will show how HPSF has already proven to be the key for further growth, and how it helped us to mature Kokkos into one of the most reliable HPC software libraries available. I will also provide some thoughts on how AI assistant coding will possibly make it even more important for the HPC community to coalesce around the usage of some well maintained key software libraries.