Several high-end HPC cluster systems have already surpassed the 100,000 core mark and machines with over 1,000,000 cores are on the horizon. While this promises unprecedented compute power and opens the door for new scientific discovery through advanced simulation, it comes at the price of increased complexity in both hardware and software. To deal with this complexity, users will require programming environments that scale with the machine. This includes performance analysis and debugging tools, which need to be capable of collecting, analyzing, and presenting data from all cores in a system. To satisfy these requirements we can not simply scale existing tool solutions that work on few hundred nodes; instead we require a set of new techniques that are explicitly designed and optimized for scale.

In this talk I will show how we address this challenge in the ADEPT project at LLNL. In particular, I will focus on three of our tool sets that demonstrate different aspects necessary to achieve scalable tools: the use of hierarchical communication and online analysis in the Stack Trace Analysis Tool (STAT), the need for application specific rapid tool prototyping, as supported by the P^nMPI infrastructure; and the design of a component infrastructure based on the Open|SpeedShop tool set.

KIT – Campus Süd, Fakultät für Informatik, Am Fasanengarten 5, 76131 Karlsruhe, www.informatik.kit.edu

Montag, 10.05.2010, 17:30

Informatik-Hauptgebäude (50.34), HS -101 (UG), Am Fasanengarten 5, 76131 Karlsruhe

www.kit.edu