

10¹⁸ INTERNATIONAL EXASCALE SOFTWARE PROJECT

Several recent high profile studies from the computational science community make it clear that the radical new design properties of future extreme-scale platforms—massive concurrency, processor heterogeneity, constrained power budgets, complex memory architectures, unprecedented data I/O requirements—will require equally radical innovations in the software infrastructure that scientists and engineers will need to enable their extreme-scale research. But the challenge of creating an entirely new software stack for high performance computing is daunting. Because it was clear to many community leaders that, for various reasons, this challenge would demand an unprecedented level of coordination and cooperation within the worldwide open source software R&D community, the International Exascale Software Project (IESP) was created in 2009 to catalyze and help orchestrate the collective effort necessary to meet it. The IESP’s guiding purpose is to empower ultrahigh resolution and data intensive science and engineering research through the year 2020 by developing a plan for 1) a common, high quality computational environment for peta/exascale systems and for 2) catalyzing, coordinating, and sustaining the effort of the

international open source software community to create that environment as quickly as possible.

During its first two years of work, the IESP has organized seven workshops at different locations around the globe: Santa Fe, NM (USA); Paris, France; Tsukuba, Japan; Oxford, UK; Maui, HI (USA); San Francisco, CA (USA); and Cologne, Germany. The agendas for each workshop were structured to provide progressively greater definition for the components of the IESP plan, with each successive meeting building on the results of the previous meeting. Version 1.1 of the IESP Roadmap was published electronically on October 18, 2010. The work of the IESP is also credited with helping to stimulate major new government initiatives in the US, the EU, and Japan focused on (and working together toward) a new HPC software infrastructure for extreme-scale science. Finally, the IESP recently played a leading role in developing a “Co-design Code Team Survey,” which was to assess the software infrastructure requirements of extreme scale application groups in the US DOE community, and a “Survey of System Software Stacks,” which provides an up-to-date snapshot of the software infrastructure at more than twenty supercomputing centers around the world.



INTERNATIONAL **EXASCALE** ROADMAP SOFTWARE PROJECT

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www.exascale.org