

HYP_Link

US Department of Energy Unveils Post-Exascale R&D Program

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RECENT DEVELOPMENT

The US Department of Energy's Oak Ridge National Laboratory [will head up a new \\$23 million research program called New Frontiers](#) that seeks to establish government/industry partnerships to advance HPC performance and efficiency. The initiative will support new and/or accelerated R&D of technologies targeted for production within the next five to ten years and is open to hardware, software, and cross-cutting technologies including:

- Energy efficiency for the next generation of exascale computing
- Open-source and sustainable software technologies for extreme scale HPC systems
- Development of techniques necessary to support emerging workloads of DOE facilities

ANALYST COMMENTARY

This program comes at a critical time when many advanced computing sites can no longer afford purchasing ever-more-powerful supercomputers and instead are opting for smaller, more workload-specific architectures tuned to meet key workload requirements. The name itself "New Frontiers" likely pays homage to Oak Ridge's current flagship Frontier supercomputer while signaling that next generation DOE-funded HPCs will be forthcoming, targeted for both the DOE and perhaps other high end HPC sites. What remains to be seen is whether post-exascale computing will continue the status quo of pursuing bigger, faster systems or mark a paradigm shift for smaller, more specialized systems that demand less power.

If the DOE plans to continue purchasing large supercomputers in whatever form, continued investment at the industry level may be critical to ensuring vendors can supply the appropriate technology and related systems that meet HPC end user requirements. There are significant bottlenecks to ever-expanding computing as Moore's Law predicts limitations on minimum processor sizes and Dennard scaling predicts significant heat production increases for more powerful processors. Initiatives such as this can help incentivize industry leaders to continue to pursue creative solutions but such considerable problems may need substantially more investment from multiple parties to solve. HPC vendors will likely want to see the potential for the resulting technology's commercial prospects in exchange for committing resources to what could be unique government procurement requirements.

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