



## HPC Fabric Wars Are Heating Up

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Hallmarks of high-performance computing (HPC) are the use of parallel processing and the related frequent need for fast communication among processors, and between processors and memory subsystems, while problems are running. This contrasts sharply with the world of enterprise business operations, where problems are almost always embarrassingly parallel and can run from start to finish on a single, isolated processing element. Interconnects are the internal networks within HPC systems that carry processor-processor and processor-memory communications.

During the past decade, the market for HPC interconnects has been dominated by Ethernet and InfiniBand variants. IDC research shows that Ethernet has consistently maintained about a 50% share of this growing market, while the InfiniBand share has grown to nearly 40%, mainly by scooping up the declining market share of proprietary interconnect products.

Proprietary and InfiniBand interconnects, because of their low-latency characteristics, are generally preferred for use in the largest, most powerful supercomputers. Of the top 100 systems on the [November 2014 list](#) of the world's most powerful supercomputers, 50 feature proprietary/custom interconnects, 48 employ InfiniBand, and only 2 use Ethernet. On the entire list, 225 of the 500 supercomputers (45%) employ InfiniBand interconnect fabrics.

It's in the rarified upper altitudes of the TOP500 list, especially the top 100 supercomputers, where the battle for interconnect supremacy seems poised for the greatest competition. Today, Mellanox is king of the InfiniBand mountain. But Intel acquired important interconnect assets from Cray, QLogic, and Fulcrum several years ago. At the SC14 supercomputing conference in New Orleans in November 2014, [Intel announced](#) that its next-generation interconnect fabric, called Omni Scale, will be a non-InfiniBand solution that supports entry-level to extreme-scale HPC systems.

So it's possible that Intel will be introducing an interconnect product that is at least partly proprietary, although IDC expects that the Omni Scale fabric will compatibly support HPC workloads that have been running on InfiniBand and Ethernet interconnects. Still, there is boldness in rolling out a non-InfiniBand solution after a decade of InfiniBand gains at the expense of proprietary interconnects. Intel presumably has the muscle to make this do well in the marketplace, assuming the product is done well.

But that's not all, folks. Germany's [EXTOLL](#) and others are also starting to roll out interconnect products designed to compete head-on with InfiniBand (and Ethernet) rivals. Meanwhile, current market leader Mellanox is not exactly sitting on its hands. At SC14, [Mellanox introduced](#) its EDR 100Gbps ConnectX-4 InfiniBand interconnect adapter. (100Gbps InfiniBand is starting to work its way through the marketplace.)

With data-intensive computing expanding fast on both the simulation and analytics fronts, IDC expects the worldwide HPC market for storage and interconnects to grow at a robust 9.0% CAGR, from \$3.8 billion in 2013 to \$5.9 billion in 2018. Some of the analytics growth will come from online and other commercial firms that have begun adopting HPC for their most daunting business problems.

IDC welcomes your comments on this topic at [hpc@idc.com](mailto:hpc@idc.com).

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