HPC User Site Census: Processors

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EXECUTIVE SUMMARY

The Processors Report is part of Intersect360 Research's Site Census series and provides an examination of the processor use in systems found at a sample of HPC user sites. We surveyed a broad range of users about their current computer system installations, storage systems, networks, middleware, and applications software supporting these computer installations. Our goal in this analysis is to examine the processor suppliers, products, and configurations used in high performance computing systems.

Key findings of this report include the following:

- The x86 processor continues to be the predominant architecture for HPC servers, with more than 90% of systems in our total site survey reported to be based on these processors from AMD or Intel. The data reflects this same x86 dominance when examining processors by node count and by core count.

- Intel remains the market share leader and has widened its margin over its smaller x86 competitor, AMD. More than 90% of new systems (installed in 2014 or later) are built with Intel processors, with AMD's share falling to single digits for the first time in our surveys.

- The number of cores per processor continues to rise. When studied by year of acquisition, the average number of cores per processor has nearly doubled since 2010. Most (90%) processors have more than two cores, with the greatest concentrations at 7-8 cores (22%) and 13-16 cores (25%).

- Memory capacities are increasing at all levels – per core, per processor and per node. Average memory per core is 4.6 GB, more than double that of pre-2010 levels. This will have significant implications on system architectures, application design, and spending habits as core counts continue to rise.

- The share of accelerators in recently deployed systems dropped in our latest survey after four consecutive years of growth. Nvidia continues to be the dominant accelerator supplier, although Intel has made inroads into this market over the last two years.

- Two-socket compute nodes remain the most common configuration in distributed memory systems. The cluster continues to be the most prevalent architecture, with smaller contributions from blade, MPP, and SMP systems.