HPC User Site Census: Systems

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EXECUTIVE SUMMARY

The *HPC User Site Census: Systems* report, part of Intersect360 Research's Site Census series, provides a detailed examination of the server systems installed 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 the applications software supporting these computer installations. Other reports in this series include: *HPC User Site Census: Processors; HPC User Site Census: Applications; HPC User Site Census: Interconnects/ Networks;* and *HPC User Site Census: Storage*.

Our goal in this report was to discover system-level trends within HPC user communities by examining supplier penetration, architecture trends, and node configurations.

Key findings of this Site Census surveys include the following:

- IBM, Dell, and HP were the top named vendors out of 44 in our all-site database. The top five named vendors (also including SGI and Cray) captured 61% of the systems market. Dell is the top named vendor within the commercial and academic sector while IBM is the top vendor at government sites.
- IBM, followed by Dell, were the top named vendors for number of nodes installed when outliers (i.e., systems with 2,000 or more nodes) are excluded.
- Two-processor nodes continue to dominate cluster installations at surveyed sites, with 61% market share. Four-processor nodes are installed on about 16% of the clusters. Both shares have been relatively consistent over the past five years.
- Multi-core processors represent the majority of systems shipped since 2006. For recent installations and upgrades, single-core processor share is now in very low single digits. Eight-core processors hold the greatest share, followed closely by six-core processors.
- Memory usage per node and processor are growing. Memory per core had remained relatively constant over the years until this year, when memory per core increased. As core count increases, so will memory requirements, affecting system design and cost.
- Accelerators are used on about 26% of the installed base with on-node being the preferred configuration. Share of systems with accelerators that were last modified in 2012+ increased significantly to 44%, from 24% in 2011. Intersect360 Research believes that this technology is starting to be used beyond evaluation and testing for some applications, especially for those installations with high accelerator counts. Evaluation is still a significant share of accelerator installations as respondents compare NVIDIA GPUs to Intel Xeon Phi.

COMPANIES MENTIONED IN THIS REPORT

Companies mentioned in this report include:

- Acclereyes
- Ace Computers
- Advanced HPC
- Amazon
- AMD
- Apple
- Aspen Systems
- Atipa
- Bull
- Clustered Systems
- ClusterVision
- Cray
- D.E. Shaw
- Dell
- DRC
- DTI
- E4 Computer Engineering
- Fujitsu
- Generic
- GiDEL
- HP
- HPC System
- IBM
- IBM/ClusterVision
- In-house
- Inspur
- Intel
- Isilon
- Linux Networx
- Megware
- Microway Technology
- NEC
- NVIDIA
- OmniTech
- Opennebula
- Oracle
- Penguin Computing
- PSSC Labs
- R Associates
- Rackspace
- SGI
- Silicon Mechanics
- Supermicro
- Tibco
- T-platforms
- V3Gaming, GPU-Xpander
- VA Linux
- Western Scientific
- Wipro
- YarcData

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TECHNOLOGIES COVERED IN THIS REPORT

- HPC system elements
  - Systems, clusters
    - HPC clusters
    - Supercomputers
    - SMPs
    - MPP systems
  - Server technologies
    - Rack-mounted servers
    - Blades
  - Memory configurations
- Processor elements
  - Accelerators and co-processors
    - GPU computing
    - FPGAs
    - Other accelerators or co-processors
  - Hybrid (accelerated) system processors (e.g. Intel MIC, AMD Fusion)
- Cloud computing, grid computing, utility computing
  - Public cloud technologies
  - Private cloud technologies

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