

HPC User Site Census: Primary Applications at HPTC Sites

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EXECUTIVE SUMMARY

This report is part of our HPC User Site Census series and provides an examination of the primary application software found at a sample of HPTC 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. Other reports in this series include: *HPC User Site Census: Systems*; *HPC User Site Census: Processors*; *HPC User Site Census: Interconnects/Networks*; *HPC User Site Census: Storage* and *HPC User Site Census: Middleware*.

Our goal in this analysis of applications is to examine the suppliers, products, and primary usage of the software packages.

Key findings of the Site Census surveys include the following:

- 320 unique supplier packages were listed by the HPTC sites. About three-fourths appeared at only one site, indicating the diversity of application needs and the research nature of the HPC market.
- Biological/chemical research, fluid dynamics, and structural analysis were the top three usage categories for application software for the last four survey years.
- The leading application software packages were Gaussian, ANSYS's Fluent, and Simulia's Abaqus. All of these top packages were used at multiple sites.
- Of the top 10 applications by number of mentions, five were biological/chemical, three were structural, one was fluid dynamics, and one was weather/environmental modeling.
- Open Source was the leading source of programs, with 34% of mentions, overtaking commercial ISVs with the addition of the 2011 survey results. About 90% of the open source codes were reported by academic and government sites. Commercial ISVs accounted for 31% of mentions. The remaining software was developed in-house or was public software.

System vendors should work to support applications through a multi-stage process, which includes: basic programming support, development of applications support staff, porting of major codes, and development of vertical market expertise.