Cloud Computing in HPC: Rationale for Adoption

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EXECUTIVE SUMMARY

Intersect360 Research conducted a survey of High Performance Computing (HPC) users regarding their adoption of cloud computing resources. This study sought to understand the adoption of cloud computing for HPC applications, as well as the barriers, drivers, and rationales for using or evaluating cloud resources. For the purposes of this study, Intersect360 Research defines cloud computing as the outsourcing of all or part of an IT infrastructure or workflow through the web or a web-like interface. This definition is inclusive of both public and private cloud models, as well as hybrid models that blend the two.

This report looks more deeply into reasons and rationales for using or evaluating cloud solutions. Respondents were surveyed about nine possible reasons to adopt cloud computing, and were also able to provide additional rationales. "Access to extra resources to meet peak system load requirements" is the top reason for respondents to evaluate cloud systems. Major rationales for cloud use were identified:

- Cost Avoidance – The continued demand for compute cycles leads HPC sites on a continuous quest to get as much computing as possible for their budgets. Cloud computing thus becomes interesting for its potential to deliver low-cost computing cycles.

- Capacity Management – Users are considering cloud for capacity management issues including periodic demand peaks and better management of data center growth, power, and cooling issues.

- Collaboration – The integration of internet-based applications and communications may allow HPC users to better work with those both inside and outside of their organizations.

- Evaluation of Cloud Systems – Users looking at the cloud system alternative to determine if and how they can make use of the technology and concepts.

- Organizational Requirement – Making sure that the competition does not "steal a march" with a new technology.

This report provides study results and analysis for the survey questions associated with each rationale and compares responses for cloud evaluators and current users.