Cloud Computing in HPC: Usage and Types

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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.

The goal of this study is to help the HPC vendor community understand the size of the cloud opportunity in HPC and guide them in the development of products and services to meet the needs of HPC users who choose to adopt cloud.

For the purposes of this study, Intersect360 Research defines cloud computing is 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. Other definitions of cloud, including cloud as an architecture or cloud as a singular web-spanning resource, are valid in other contexts but not directly relevant to HPC.

All respondents were asked foundational questions to characterize their use of cloud computing for HPC workflows at this time. Choices were: using, evaluating (with no decision to adopt yet), and not using (evaluated but decided not to adopt). Depending on the response, they were directed to a more detailed panel of questions to provide us with more detailed thoughts about cloud computing.

Those who were using or evaluating cloud systems were asked to identify their cloud systems as public, private, or hybrid model types. The web-based survey received 155 qualified respondents from HPC users.

This report explores cloud system usages and types. Other aspects of the survey will be presented in other "Cloud Computing in HPC" reports. Our major findings include:

- There is greater interest in evaluating private and hybrid cloud systems than public cloud systems. For organizations evaluating cloud types, multiple types are under consideration.

- Hybrid cloud systems may demand new kinds of contracts that spell out ownership and possession of HPC assets and responsibilities for HPC cloud system operations.

- For organizations implementing public, private, and hybrid cloud types, pure-play choices dominate the distribution. These HPC organizations are early adopters and apparently choose an approach to pursue.

- The private cloud type holds the greatest share at this time. HPC sites with larger budgets favor the private cloud type.