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An Overview of Compute-Intensive Utility Computing

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January 2007

Executive Summary

Utility computing is a usage model in which customers pay for computational resources through an established fee-per-time schedule, as if they were utilities. These fees can cover hardware, software, or storage usage, and fees for associated services rendered. Typically the utility computing customer logs into a remote computer hosted by the provider, possibly uploading data pertinent to the calculation. The provider then logs the time and resources used. Utility computing as a service has existed for many years, but with the increased demand for high-performance computing (HPC) resources, it is emerging as a worldwide trend.

As HPC customers strive to maximize their investments, other related trends have also emerged, such as grid computing and on-demand computing. Grid computing is a model in which networked computing systems are virtualized such that the customer does not know (or care) which part of a system is providing the answer, just as most residential customers using electricity on a power grid do not know what type of facility provides the electricity that reaches their homes.

Offerings such as IBM's Deep Computing Capacity on Demand (DCCoD) combine both utility computing and grid concepts and thus might be called "utility grids." The business model is based on utility computing approaches of providing customers with computing resources or capacity on a pay-for-use basis. This business model is enabled by grid concepts and technology.

Although various forms of utility computing have existed for some time, IDC believes that a confluence of market factors is making it more prevalent than before. More companies than ever are seeking competitive advantage through high-performance computing, but many lack the facilities or budgets to expand their own infrastructures to meet the internal demands of their scientists, engineers, or analysts. Furthermore, customers who are seeking to become more responsive to their own customers' needs might wish to have immediate flexibility in their computational capabilities. Lower cost and increased flexibility are two of the main goals of utility computing.

Computationally intensive utility computing is a complex model. Not all equipment providers can successfully deliver it. The required technology, processes, and skilled staff need to be carefully managed *as a whole* in order to make the utility model a success. The utility computing model provides a solution to many compute-intensive problems and has great potential for addressing mainstream IT challenges.

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