What is Cloud Computing and Why Do We Need It?

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In the article "Above the Clouds: A Berkeley View of Cloud Computing" (Armbrust, et. al, 2009) the authors hail cloud computing as "the long-held dream of computing as a utility" (p.1) where capacity is seemingly infinite, scalability is instantaneous, and users only pay for what resources they use and only for as long as they use them. Cloud computing is not new, but the term has been embraced as a way to describe IT service offerings which are untethered from the need to own and maintain the infrastructure which supports them. The idea of cloud computing has evolved from the computer time-sharing visions of the 1960s, through distributed computing and the rise of networks, to the Internet and the online services found today. While some online services that are part of the cloud have been around for a while - such as email, information hosting, and data storage - the concept of the cloud as a platform for applications is evolving. The Cloud Security Alliance (2009) declares that the "cloud describes the use of a collection of services, applications, information, and infrastructure comprised of pools of compute, network, information, and storage resources. These components can be rapidly orchestrated, provisioned, implemented and decommissioned, or scaled up and down" … (p. 13).

There is currently no singularly agreed upon definition of cloud computing but one proposed by the National Institute of Standards and Technology (NIST) has gained fairly broad acceptance - being referenced in guidance produced by the Cloud Security Alliance (CSA) and the European Network and Information Security Agency (ENISA), among others. NIST defines cloud computing as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell & Grance, 2009, p. 1). The NIST definition of cloud computing includes five essential characteristics (on-demand self-service, broad network access, resource pooling, rapid elasticity, measured service), three service models (infrastructure, platform, software), and four deployment models (private, community, hybrid, public) (Mell & Grance, 2009). Two items which are not specified as requirements in the NIST definition - virtualization and multi-tenancy - are likely to be commonplace in cloud computing. ENISA (2009) states "Cloud providers, by their very nature, are tasked with providing a multi-tenant environment, whether this is via virtualization on a server or the common network shared by the customers" (p. 43).

Now that we have an idea as to what cloud computing is all about, let's examine why an organization would consider cloud services. Not surprisingly, the potential for cost savings is a huge factor in the equation. In the 2010 Global Information Security Survey, Ernst and Young (2010) found organizations searching for ways to reduce IT expenditures without sacrificing technological advantages, stating: "Their interest lies in computing services that require significantly less initial investment, fewer skilled internal IT resources and lower operating costs. As a result, cloud computing services are gaining greater adoption …" (p. 10). Two cloud user surveys from IDC (2008, 2009) show that the potential for cost

savings is the major driver of cloud services adoption by organizations. The most recent IDC (2009) survey found that of the top five ranked cloud service benefits selected by participants, three were economical in nature: "pay for use (#1), payments streamed with use (#3) and shift of IT headcount and costs to the service provider (#5)" (para. 3).

The cloud does seem solve some long-standing issues with the ever increasing costs of implementing, maintaining, and supporting an IT infrastructure that is seldom utilized anywhere near its capacity in the single-owner environment. There is an opportunity to increase efficiency and reduce costs in the IT portion of the business and decision-makers are beginning to pay attention. Vendors who can provide a secure, high-availability, scalable infrastructure to the masses may be poised to succeed in getting organizations to adopt their cloud services. So, why wouldn't an organization consider cloud services? We will examine some of the issues in the next article.

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