



A Sunny Outlook for Cloud Computing

by Jill Gilbert

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Cloud computing is emerging as a new information technology (IT) delivery method. Organizations large and small have mature IT systems that are ready for replacement. They need to consolidate systems and standardize business processes, in addition to being concerned about regulations and reporting requirements, accountability, and transparency. With increasing complexity, aging technology, and outdated systems, organizations are looking to the Internet to accomplish their IT missions with limited resources.

Cloud Computing Clarified

Cloud computing is an approach to sharing IT infrastructure,¹ with the delivery of services and software via the Internet—the Cloud—rather than using software or storage on a local PC. The National Institute of Standards and Technology's definition of cloud computing features five essential characteristics, three service models, and four deployment models (see Figure 1).

Common Uses of the Cloud

You are already in the Cloud if you use any of the following services:

- A software-as-a-service (SaaS) application in your enterprise. Several leading environment, health, and safety (EH&S) software firms offer their applications via the Internet (see "Software as a Service—A New Generation of Online Software Delivery," *IT Insight, EM* October 2007, p. 26).
- Windows Live portals/shared workspaces in your small business (home.live.com).
- OpenOffice applications—spreadsheets, word processing, and more (openoffice.org).
- Google applications (docs.google.com).

Typical business uses include:

- **Business analytics and computing**—organizations can tap into data centers like those offered by Amazon and IBM to analyze large data sets, scaling capacity up or down as needs change, while paying only for the capacity actually used.
- **Data storage and information archive**—a simple Web services interface allows users to store and

retrieve data, any time, from anywhere via the Internet.

- **Relational database**—users can set up, operate, and scale a relational database (e.g., MySQL or Oracle) in the Cloud. The service provider takes care of database administration tasks.
- **Software application development and testing**—software firms and IT departments can rent capacity to meet peak computing needs instead of installing and maintaining their own servers.
- **Collaboration**—file sharing, Web conferencing, instant messaging, e-mail, scheduling, and contact management can all be handled via the Web.
- **Business desktop**—online versions of familiar office software applications.

Growing Acceptance

Massive increases in storage and computing power now make number crunching possible at very large scales and with declining costs.² Also, advances in wireless technology make communicating over the Internet almost second nature. This makes the Cloud attractive to businesses.

Organizations use the Cloud to achieve a variety of objectives. For example, many companies subscribe to commercial EH&S SaaS applications and 20 million businesses use Microsoft Cloud services to deliver familiar software applications;³ in February, over 11,000 airline crew members at KLM migrated to Google's Gmail to send and receive e-mail from any location, using any Internet-connected device (e.g., laptop, shared computer,

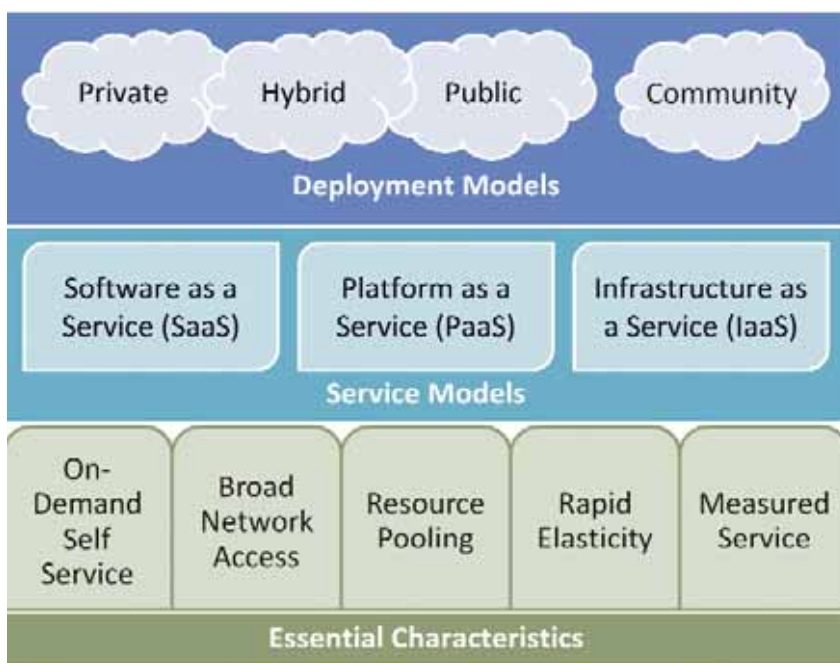


BlackBerry, SmartPhone, or PDA);⁴ and Coca-Cola Enterprises recently migrated to Microsoft Online Services, using collaboration tools for electronic content management, automated workflow, instant messaging, and Web meetings.⁵

Benefits and Challenges

Some organizations welcome the move to cloud computing, while others are not as accepting. Cloud computing has many benefits:

- **Reduced infrastructure risk**—the service provider installs servers, database software, and application software; the user does not have to make large capital investments.
- **Managed**—the service provider manages and maintains the IT hardware and software, allowing users to focus on higher value-added activities.
- **Flexible and scalable**—the “on demand,” self-service provisioning of resources allows users to meet a variety of computing and storage needs without engineering for peak loads.
- **Reliable**—the use of multiple redundant sites and automated backup routines support business continuity and disaster recovery needs.



- **Sustainable**—the service provider makes technology upgrades.
- **Secure**—security is often as good as or better than traditional systems.

Figure 1. NIST visual model of cloud computing. Source: <http://csrc.nist.gov/index.html>.



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Best Practices for Moving to the Cloud

The Cloud Security Alliance (CSA), a nonprofit organization formed in March 2009 to promote the use of security best practices and provide education on the uses of cloud computing, recently released Version 2.1 of “Security Guidance for Critical Areas of Focus in Cloud Computing” (www.cloudsecurityalliance.org/csaguide.pdf).

The CSA recommends a risk-based approach when considering a move to the Cloud:

- Determine exactly what data or function is being considered.
- Assess how important the data or function is to the organization.
- Determine which options are acceptable: public; private (internal); private, (external); community; hybrid.
- Evaluate the degree of control available to mitigate risk.
- Map the data flow in and out of the Cloud to identify points of exposure to risk.⁷

- **Low cost of entry**—small and large businesses alike can take advantage of computing power, as they forego internal hardware and software capital expenditures.
- **Cost effective**—service providers offer “pay as you go” metered usage, often with no long-term contracts or commitments.
- **Reduced complexity**—simplified, centralized on-demand platform, not limited by local IT resources.
- **Workload optimization**—lower energy use by harnessing otherwise idle computing and storage capacity; potentially reduced IT impact on the environment.
- **Better user experience**—on the whole, software and services built on Web platforms are more intuitive and user-friendly.

Cloud computing also presents several challenges:

- **Access to stored data**—the service provider, not the user, physically controls the data.
- **Limited choices**—users are limited to the applications or services their provider offers.
- **Information security**—data stored on servers that may be shared with other clients requires more complex security measures than data managed wholly on premises.
- **Compliance**—the Sarbanes-Oxley Act (2002), the Health Insurance Portability and Accountability Act (HIPAA; 1996), and other issues call for

transparency, a defensible audit trail, and privacy while moving data in the Cloud.

- **E-Discovery**—how, and how quickly, the vendor will help meet data requests in the face of lawsuits, compliance audits, data breaches, and other legal situations.⁶
- **Integration**—little or no ability to integrate with systems outside the Cloud.
- **Customization**—typically lacks the ability to customize software.

The bottom line is, the return on investment (ROI) for any IT initiative depends on internal IT resources, budget, need for customization, and integration with other software applications. Beyond the ROI calculation, each organization has a certain risk tolerance and must decide what is right for them.

Moving to the Cloud?

The Cloud changes how organizations deliver information, offering on-demand, anytime, anywhere capabilities. It helps put idle computing resources to work, potentially reducing IT’s carbon footprint. It removes cost-of-entry barriers by allowing users to “rent” hardware and software capacity, and opens new collaboration possibilities. **em**

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