American
Technology Services

# BEST PRACTICES: CLOUD COMPUTING

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There is a large amount of information (and misinformation) circulating about "moving to the cloud" — and many businesses are jumping to cloud computing without fully understanding the technology, its capabilities, or limitations. Instead, we recommend that businesses take a step back to learn what "the cloud" means for them today and what it can deliver in the future.

American Technology Services, Inc. wants our clients to understand what moving their environment to cloud computing really means, not only from a cost standpoint, but also strategically and operationally. The impact on everyday productivity and quality of work must be evaluated along with the long-term pros and cons. By having this essential understanding, businesses can have realistic expectations of how they will be affected positively and/or negatively by moving to the cloud.

This paper is part of a series of "best practices" guides for American Technology Services' clients. We offer these guides a tool to evaluate important issues in information technology, and to clarify concepts that are sometimes hard to understand.

**Definitions**

**Cloud:** A term that is sometimes used to refer to the Internet as a whole, but in our definition, "the cloud" means a computing utility that delivers on-demand IT services (usually in a per user pricing format). The cloud is accessible via the Internet, but could also be set up with private access that is not available to everyone via the Internet. The key concept is "on-demand" service. The "cloud" is the computing equivalent of an electric utility. It provides a specific function, offered on-demand, although there may be sign-up processes and fees associated with using it.

**Cloud computing:** The use of on-demand resources located in a computing utility, which is generally a public data center environment. Cloud computing may also be located in a private data center, and accessible either through the Internet or through private data communications lines. The key concept is the on-demand aspect – that is, in order to use cloud computing, a user need not be concerned about purchasing equipment. In theory, a cloud computing user simply asks for and receives the access as needed, when needed.

**Private Cloud:** A computing utility designed and implemented as an on-demand environment for a specific user or organization. For example, a private cloud is typically set up specifically for a single organization with unique needs that cannot be met using standard cloud capabilities. For example, a private cloud might be suitable for a bank with high security on-demand computing needs, or for an organization that wants to replace its in-house traditional server infrastructure with an on-demand computing environment. By definition, private clouds have different cost structures than totally public on-demand cloud environments.

**SaaS:** Software as a Service, or SaaS, is one of many types of cloud-based computing. SaaS refers to the ability to use a specific type of application in an on-demand form. Examples of SaaS are Salesforce.com, Gmail, Hotmail, and QuickBooks Online. In most cases, the user pays a monthly fee for service (and sometimes, no fee at all), and there is no license to be purchased. Generally SaaS does not require the user to install anything either. Every function is delivered through a web browser interface or "app"

packaged especially for the SaaS purpose. To appreciate the potential impact of the SaaS model, compare it with the traditional method of accessing an application such as Dreamweaver. In the traditional model, one buys Dreamweaver as a license, either downloaded or in a retail box, where the license covers a specific number of copies in perpetuity. In contrast, using Dreamweaver in a SaaS environment typically features a subscription model, where the use is metered but there is no commitment and the rights to use are limited to the instance of the subscription.

**PaaS:** Platform as a Service, or PaaS, is another type of cloud-based computing. PaaS refers to the on-demand delivery of cloud-based computing platform and solution stack. PaaS is especially beneficial to developers, giving them the application infrastructure for design, deployment, and testing. Examples of PaaS are Google Apps and Oracle Fusion Middleware.

**IaaS:** Infrastructure as a Service, or IaaS, is another category of cloud-based computing in the form of network infrastructure. This model provides an organization with all the capabilities it would receive from maintaining its own server, software, and other network equipment onsite, but on an on-demand outsourced basis. The provider operates, owns, and maintains the equipment rather than you housing it on-premise. Examples of IaaS are Amazon web services, GoGrid, and VMware vCloud.

**Microsoft and Cloud Computing**

It is difficult to discuss cloud computing as it relates to general business without mentioning Microsoft and their use of the term. Microsoft has invested a large amount of money in a cloud infrastructure, and when they talk about cloud computing they are often referring to their cloud-based application bundle of Exchange/Outlook, Office Live Meeting & Communications Online, and SharePoint. Initially marketed as Business Productivity Online Services (BPOS), the new term for this bundle is Office365, which was officially launched on June 28, 2011. In its planned official release, it will also include Office applications, like Word and Excel. Significantly, it will offer licensing through a subscription model, either as an installed product (as the applications are used today) or an online-only model (as simplified web versions of the current Office applications.) Clearly, these moves are in response to Google Docs and Gmail, which threaten to take market share from Microsoft.

It is also important to specifically mention SharePoint, which will continue to be offered in Office365, since this platform is a major focus of Microsoft. SharePoint is a great tool; however, it can also add complexity. For example, without SharePoint, you may have previously stored your data in a file server, requiring the activities of a network administrator. With SharePoint, in contrast, you will need both a network administrator and a SharePoint/web server administrator. Additionally, SharePoint requires a build out based on your business' needs, so that the data is housed in a way that works for you and your employees. In short, SharePoint does not create less work for you, and often it actually creates more. With SharePoint 2010 and Office 2010, there is an application called SharePoint Workspace that facilitates the replication of data and files with a cloud-based SharePoint instance.

**Common Questions**

*Why move to cloud computing?*

Cloud computing allows you to access your business applications from anywhere in a per-user cost format. It also eliminates the need to store, maintain, and depreciate the infrastructure equipment on your premises, which can result in significant overhead cost savings. Cloud computing also easily allows for unlimited storage and easy scalability based on business needs.

*Can you move everything to the cloud?*

At this point, all business applications can be moved to the cloud. However, just because they *can* be moved to the cloud, doesn't mean they *should*. The biggest concern is retaining control of your organization's data and files that are moved to the cloud, both from a security and permissions aspect.

*When do you need more than just Office365?*

Office365 is the upgrade of Microsoft BPOS that will offer a combination of on-line services and hosted software in the cloud. Office365 includes Office Professional Plus, Exchange, SharePoint, and Lync (formerly Office Communications Server).

However, you may need more than the Office365 online-only model, if you like to use Word, PowerPoint, and other Microsoft applications included in Office365 when you are not connected to a cloud. If the cloud is down or you are in a location where it cannot be accessed, you want to have the applications and data available to you. In this case, the Office365 subscription model that allows you to install the applications locally with a combination of SharePoint and the client-based SharePoint Workspace application might provide a better solution.

*When is a file server in the cloud not ideal?*

1. Graphics files – unless you have a really fast connection (>5Mbps,) it is not ideal to house large graphics files in the cloud. It is cumbersome to upload and download these large files (>100MB) over the Internet.
2. High growth in the number of files – meaning the number of large files to be stored will keep growing
3. Highly sensitive files – where is this information being stored in the Cloud and ultimately who has access to it?

*What about data protection, privacy, and security?*

When moving to the cloud, it's important to keep in mind that you don't know exactly where your data is being stored or who has access to your business' information. The real benefits of cloud computing must always be weighed against the risk of relinquishing direct control of infrastructure and applications, the potential use of unknown subcontractors, implications of data flow and storage

location, liability, and indemnification issues, privacy and data breach notification considerations, and compliance with the overlapping web of federal, state, local and international laws and regulations.

Remember that not all clouds are the same: there are premium and discount cloud providers. If you have regulatory requirements and sensitive data, you will want to have a clear understanding of these issues.

**Best Practices**

*Adjust bandwidth accordingly.* When you move to the cloud, you will need to increase your bandwidth to get the same performance. Additionally, the Internet connection will have to be prioritized as regular traffic will compete with Cloud traffic. Example : A person watching YouTube could inhibit the functionality of other applications.

*Have a redundant Internet connection.* It is important to have a redundant connection to the cloud with different carriers. This will give you another way to access your applications if one carrier experiences an outage.

*Set realistic user performance expectations.* Understand that there is a potential for operational inefficiencies. Expect periodic delays and slower applications when moving to the cloud from on-premise (especially in the case of legacy applications). While you do enjoy the capacity for unlimited storage and the benefits of not housing equipment in house, uploading and downloading is slowed when dealing with the cloud. Also, time delays are experienced based on user actions as well as your Internet Service Provider's capacity.

*Establish as much integration across applications as possible.* This will make working more convenient (you won't have to login to multiple applications with different user names and passwords) as well as make staff changes easier to manage, including the need to quickly lock down resources if necessary. Look at federated domain services to allow synchronization of user permissions and policies between on-premise and cloud services and applications.

Domain services, in a Microsoft Windows Server environment, are the domain controllers that provide user account control and security. Allows users to access multiple resources in multiple locations. When an employee leaves the company, the user's account can easily be disabled. In the absence of the domain controller, or in a non-Windows environment, some other process must fill those needs.

*Recognize the need to keep certain resources onsite*. Example: You may want to have a domain controller on-premise.

*Evaluate the feasibility of moving legacy applications into the cloud.* Some older applications will run slower in the cloud and others may have such poor performance they should not be moved to the cloud.

*Do your homework.* Thoroughly evaluate cloud vendors before selecting a provider. Check how long they have been in business, as well as Service Level Agreements, security measures, compliance, financial information, etc. Keep in mind a vendor offering discounted pricing may be doing so because they are lacking in some area that is important to your organization.