



HYBRID CLOUDS

THE BEST OF BOTH WORLDS



ABSTRACT

Cloud Computing is not a specific technology, but a model of computing. The term “Cloud” refers to both the applications delivered as services over the Internet and the hardware and system software in the datacenters that provide said services .¹

When a cloud is offered as an on-demand (pay-as-you-go) service, it is considered a Public Cloud. On the other hand, a Private Cloud refers to internal datacenters, not open to the public, that are deployed within an organization’s firewall. Private Clouds are sometimes referred to as “on-premise” Clouds, as they are hosted within the organization instead of with a third party vendor. Hybrid Clouds fuse both models together where organizations deploy an on-premise Cloud, but also utilize Public Cloud services.

So, what type of virtualization is best for you? In order to make that decision, you need to weigh many factors including:

- ▶ **The number of employees in your organization.**
- ▶ **What current data storage systems are in use.**
- ▶ **If your data is sensitive and in need of large amounts of security.**
- ▶ **Cost**

After looking at your organizations needs, you then need to familiarize yourself with Cloud product offerings before making a decision.

INTRODUCTION

Cloud Computing isn't a new concept. John McCarthy, world renowned computer scientist, introduced the idea during his speech at the MIT Centennial in 1961:

"If computers of the kind I have advocated become the computers of the future, then computing may someday be organized as a public utility just as the telephone system is a public utility."

Now, more than fifty years later, computing as a utility is a reality thanks to advancements in networking systems and interconnectivity.

As of 2009, the information technology sector has been buzzing with terms such as "Cloud Computing", "virtualization", "in the Cloud", etc... So the question is:

WHAT EXACTLY IS CLOUD COMPUTING?

"Cloud Computing" isn't a technology, but rather a model of computing.² In this model, servers, applications, and other resources are offered to an end user via a network connection (usually the Internet). So anytime "Cloud" is mentioned, it is referring to hardware, software, or services that are accessible from virtually anywhere, with a simple network connection.

*“Half the servers in a company
are devoted to software
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but they’re idle for
90% of the time.”*

Rick Telford, IBM

WHY ORGANIZATIONS GO INTO THE CLOUD

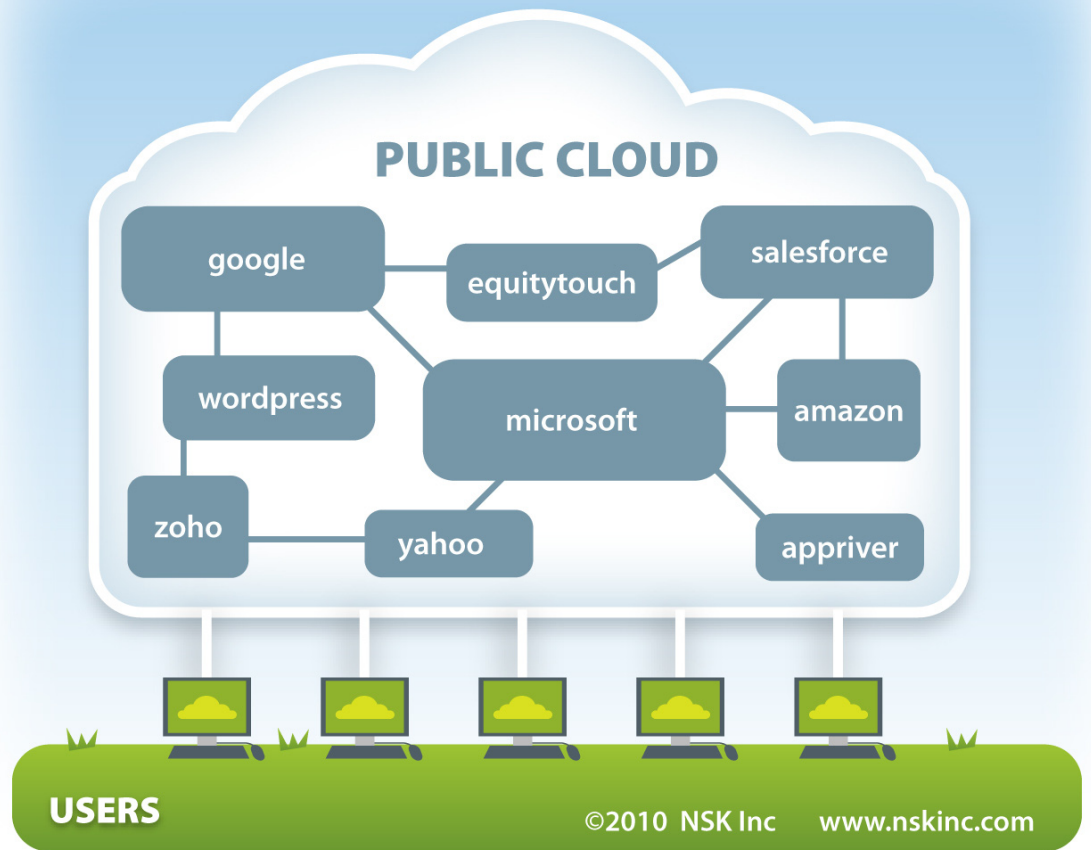
There are a multitude of factors as to why an organization would want to become virtualized. The most common reason why businesses adapt the Cloud model is efficiency. Cloud computing drastically reduces the amount of time, money, and maintenance needed to operate a traditional data management system. With traditional systems, an organization has to buy equipment; dedicate space within the office; provide specific power and cooling needs to house the hardware; and hire administrators to install, secure, and maintain the data system.³

Cost efficiency is usually the main reason why organizations become virtualized. According to Rick Telford, VP of Cloud Services at IBM, “Half the servers in a company are devoted to software development and testing, but they’re idle for 90% of the time.”⁴ Virtualization can maximize performance, reducing costs of buying additional equipment.

Cloud Computing is ideal for data storage, running desktop applications, and collaboration applications.

The Cloud is also ideal for back-up disaster recovery. Hosting data virtually allows for rapid recovery from system failures or physical damage to hardware. Say for instance the main server at your organization fails. Your in-house staff can launch a virtual version of the main server on a backup server completely identical to the original physical server. The process takes minutes and can save the organization costly downtime and aggravation.

There are three specific options for Cloud Computing and they are – **Public Clouds**, **Private Clouds**, and **Hybrid Clouds**.



THE PUBLIC CLOUD

"Having a Cloud computing model in place, organizations can trim their IT budgets"

Simplicity and scalability are the overarching benefits of having a Public Cloud. Public Clouds are offered as a service, usually over an Internet connection. An off-site third party provider hosts and manages the system. Users connect to the system via web applications or services. Public Clouds usually charge a monthly usage fee per gigabyte and bandwidth transfer charges.

Cost Having a Cloud Computing model in place, organizations can trim their IT budgets because they don't have to purchase physical hardware (which also saves on energy costs), as the servers are virtualized. Organizations can customize their Clouds with specific storage parameters, applications, and security options so that they only pay for what they need. Since the Cloud is hosted by a third party, the organization doesn't need an employee to monitor the system.

"A Public Cloud is a cost-efficient scalable alternative to hosting multiple disk arrays."

Time In house servers take time to maintain. If hardware or software configurations need to be altered, or if a server crashes or needs to be restarted, the process can often take a couple of hours or a couple of days depending on the situation. With Cloud Computing, because everything is virtualized, reconfiguring the Cloud takes minutes.⁵ Also - because the servers are hosted in the Cloud, if one server fails, another can instantly be activated, drastically reducing potential down time.

Maintenance Due to the fact that the Public Cloud system is hosted off site, internal employees are not responsible for maintaining the system. The design lets users update or introduce technologies into the system at a much faster rate as everything is managed at the host company. Utilizing resources that are in the Cloud means never having to deal with a physical server. It can all be maintained from a simple configuration dashboard.⁶

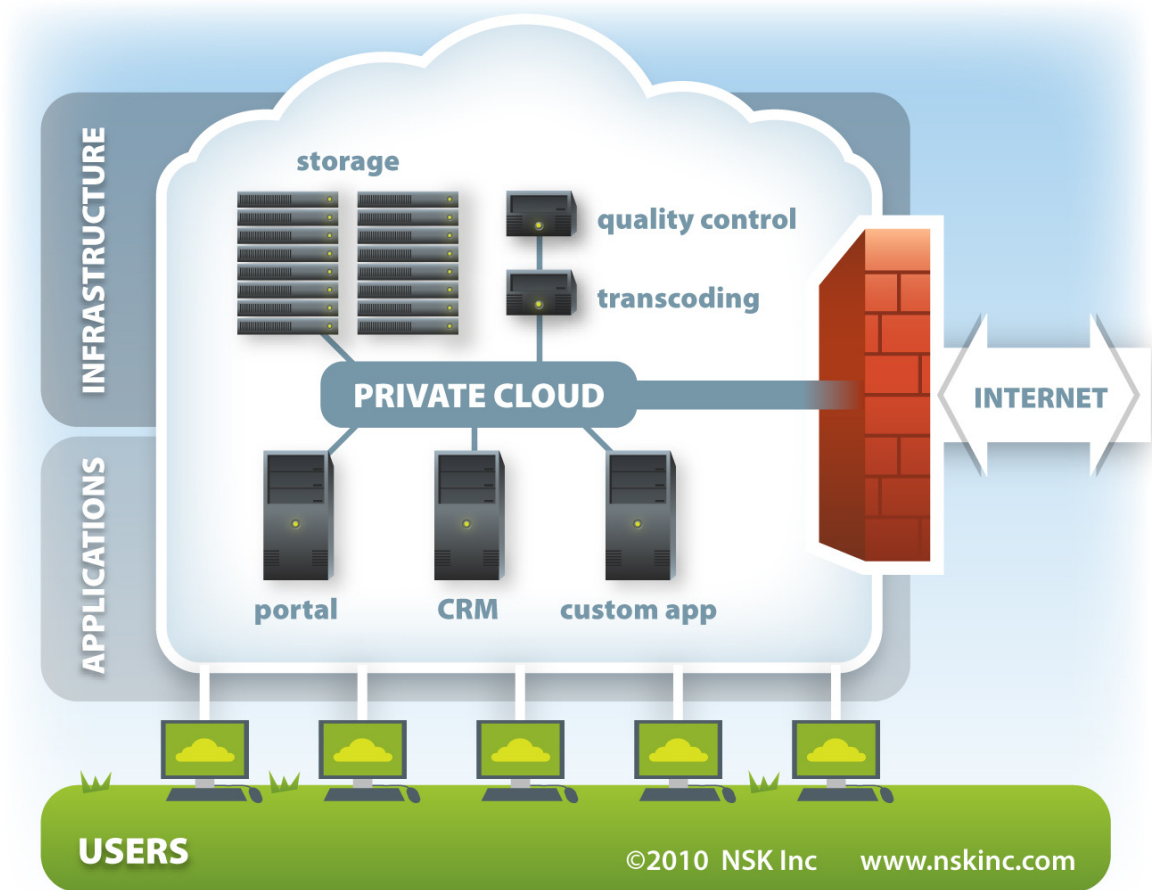
Reduced Redundancy A Public Cloud can eliminate the hardware and resources needed for data redundancy. Many organizations rely on data redundancy to keep their IT systems fail-safe. A Public Cloud is a cost efficient scalable alternative to hosting multiple disk arrays on site.

DISADVANTAGES OF A PUBLIC CLOUD

Lack of Control Due to the fact that third party providers are in charge of storing and maintaining the data systems, many feel as if they don't have enough control over their personal data.

Speed Public Clouds are based on internet connections, meaning the data transfer rate is limited to that of the Internet Service Provider (ISP), which is usually no more than 10mbps. If your organization is storing and transferring large amounts of data (high definition video for example) a Public Cloud may not be your best option.

Lack of Investment Although a great cost saving method by reducing the need to invest upfront, renting the service from an outside provider also means that there is little capital gained. Having items such as servers and network equipment can pay off in the long run as assets with tax advantages.



THE PRIVATE CLOUD

Private Clouds run on hardware attached to the organization's private network. The difference between a Public Cloud and a Private Cloud is that a Private Cloud is controlled by the organization. (Although an initial investment due to the fact hardware is required, a Private Cloud costs considerably less than traditional data management systems.) The cost savings is due to virtualization in which one physical server acts as host to several virtual servers, each of which runs on a layer of software.⁷

Control Since the hardware is on-site, organizations have more control over their data. The organization is in charge of monitoring and maintaining the data, giving them complete oversight.

Performance The Private Cloud is deployed inside the firewall on an organization's intranet, meaning that transfer rates are dramatically increased. Read access off of Private Clouds can be as fast as 100mbps, or even more if the organization has a gigabit Ethernet connection. Storage capacity is also higher with a Private Cloud. Private Clouds usually start with a few terabytes and can be increased by adding additional disks.⁸

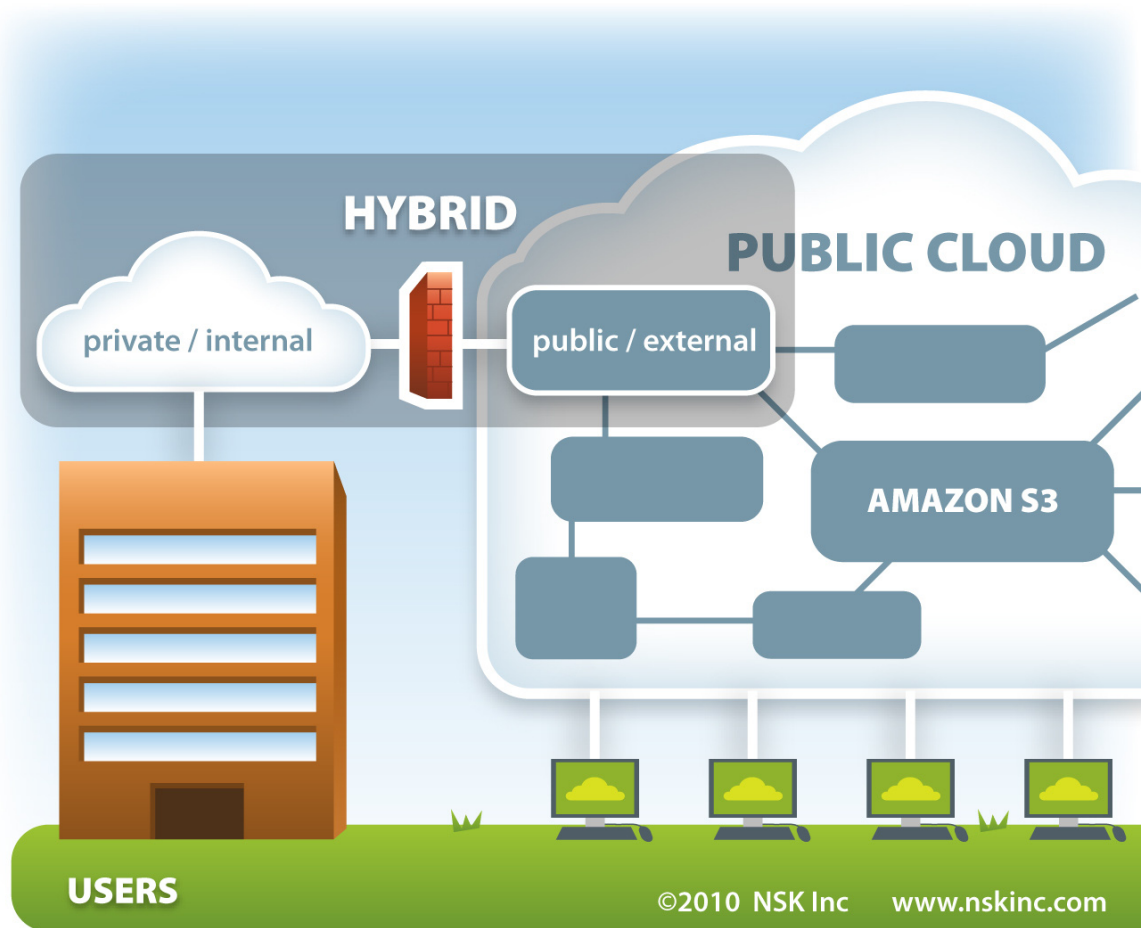
*“One system administrator
could easily manage a
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DISADVANTAGES OF A PRIVATE CLOUD

Cost Private Clouds are more expensive than public because they require both hardware and maintenance personnel. To build a Private Cloud, an organization needs to invest in hardware or use already existing systems whereas a Public Cloud is all handled off site. Private Clouds also require system administrators. However, one system administrator could easily manage a 100-node Cloud with a part-time effort.⁹

Maintenance Since the private Cloud is hosted on site, the organization needs to provide adequate power, cooling, and general maintenance. The host organization also runs the risk of data loss due to physical damage of the unit (i.e. fire, power surge, water damage, etc.).





“Hybrid Clouds offer the best features of both computing models.”

HYBRID CLOUDS

Hybrid Clouds offer the best features of both computing models, as they are a combination of both Private and Public Clouds.

With a Hybrid Cloud, an organization has their own private (internal Cloud) with services running within their firewall. However, Hybrid Clouds allow users to access data that is stored off site via a Public Cloud.

This model is beneficial when an organization wants to have control over their data storage, but needs additional space for archiving data. They have the security and supervision of the Private Cloud in their network, but can store excess data in a scalable on-demand Public Cloud.

PAVIS® CLOUD SOLUTIONS

Pavis® Cloud Solutions from NSK Inc, offer Hybrid Cloud technology providing the flexibility of a Public Cloud with the security of a Private Cloud environment.

An NSK technician installs Pavis® Cloud on your existing network and then the system can delegate what information and applications are hosted on the internal private network, and what is sent to the Cloud.

The Pavis® Cloud Suite includes:

- ▶ **Pavis® Backup - cost effective alternative to tape back up systems.**
- ▶ **Pavis® Storage - on demand storage solution.**
- ▶ **Pavis® Archive - flexible storage system for nonessential data.**

ABOUT NSK INC

NSK Inc is a leader in information technology consulting, with a focus on IT management for SMB companies. Headquartered in Boston, MA with an additional office in Palo Alto, CA, the company offers a wide array of IT services for business driven information challenges. They provide service and support for small and medium-sized businesses and groups working within large organizations. NSK Inc also creates custom software products for investment banks, equity management organizations, and other specialized industry areas. For more information, please visit <http://www.nskinc.com>.

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