

Considerations for every type of cloud implementation

September 2011 | by [Jaqui Lynch](#)

It's difficult to have a discussion around technology today without looking at cloud computing and where it fits into the data center. Cloud computing is the natural evolution of technologies such as virtualization, service oriented architecture (SOA), autonomic, and utility computing. They're combined in such a way as to enable on-demand network access to a shared pool of computing resources that can be rapidly provisioned with minimal human interaction. The promise of cloud computing comes from the way in which it can provide computation, software, data access and storage services that don't require the end user to know the configuration of the system that delivers the services.

Key Concepts

Cloud computing is dependent on several concepts. The first is virtualization, which provides the capability to share resources between servers and LPARs for many customers and clients. This allows for flexible scaling up and down and enables flexible usage-based pricing. The final concept is the one that provides much of the savings: manageability. Service-automation techniques enable on demand rapid provisioning and reduce human intervention. Additionally, it provides for services that can be delivered over the network on any platform.

These characteristics are critical to the ability to provide an agile, low cost cloud environment that's reliable, scalable and well performing. Device and location independence are also integrated into the cloud and software transparency is provided via the use of APIs. It should be noted that automation is a critical component of a cloud environment. It provides standardization and scalability while reducing manual intervention and potential errors. It also assists with audits and process governance.

For most companies there are three reasons to consider going to a cloud environment.

- Resources are only paid for when they're used, so it's possible to reduce both capital and operating costs.
- Managed clouds allow companies to refocus their personnel into the business rather than maintaining the hardware and software.
- The scalability of clouds enables clients to easily scale their environments both up and down to meet business needs.

Cloud Strata

There are three tiers of cloud environments and each has its own small flavors. The first is infrastructure as a service (IaaS). An IaaS typically consists of a virtual machine (VM) that's delivered to the customer. The provider takes care of the physical assets such as servers, network, devices, disks, etc and puts the operating system on the VM. The client is responsible for the rest and owns nearly all of the security.

The next option is platform as a service (PaaS), which consists of the resources in an IaaS plus the solution stack and middleware. The client is responsible only for the application infrastructure and may

end up managing the security for the middleware as well as the database and application runtime environments.

The final option is software as a service (SaaS), where the whole stack—including the application—is delivered as a service. All of the application upgrades and security functions are the responsibility of the cloud provider.

Deployment

There are also three varieties of cloud deployment options: private, public and hybrid. In a private cloud services are provided over an Intranet, within the enterprise and behind a firewall. These are sometimes called internal clouds and address many of the concerns regarding data security, governance and reliability. They can be wholly managed and hosted internally (private), hosted internally but managed by a provider (private managed) or hosted externally and managed externally (private hosted). The key is they're for private use only and the location of servers and data is well known.

Many cloud-related concerns come into play with public or external clouds. This is where IT becomes a service (ITAS). In a public cloud, the provider covers the costs for all of the hardware, bandwidth and applications in a shared environment. Examples of public clouds would include salesforce.com, Dropbox and Google docs. They provide the best pricing, but also require the most planning.

Hybrid clouds allow customers to transition to cloud computing while maintaining regulatory compliance. They're typically a combination of a private cloud and a public cloud with services placed where they meet the requirements for compliance, performance, security, etc.

Preparing to Surf the Clouds

Like any technology, it's important to plan for cloud computing. See "Key Questions" for a list of questions that you need to be able to answer before going into a cloud, regardless of whether it is private, hybrid or public.

First, you'll need to analyze all existing processes and determine what can be automated. In particular, full provisioning automation requires that approvals can be delegated in order to remove manual approval steps. Once that's done it's important to identify security and compliance needs for the applications and data. Different countries have different privacy laws, so it's important to understand how those might impact you. The locations where data is stored must be taken into consideration in terms of privacy laws, jurisdiction and so on.

You'll also want to ask who the provider uses for the various functions to support you and what access they will have to your data and applications. Probably the two key questions clients haven't been asking are around exit strategies and what the service-level agreement (SLA) really covers. For the SLA, it's important to read the fine print and ensure that every component in your cloud is included. If it only covers the Web servers but not the data, then the SLA has no teeth. You also need to ensure it's clear what's meant by an outage in the SLA.

Exit strategy is another critical issue. When moving into a cloud you need to plan for what happens if the cloud provider has legal problems, goes insolvent, has financial problems, gets broken into or just decides to get out of the business. At least four cloud providers have decided to get out of the business in the last year, so this isn't a remote possibility. A good exit strategy should cover how you get your data back in a format you can use and how you plan to replace those applications that are in the cloud, especially if you didn't write them or are in an SaaS environment. There have been some significant cloud outages or shutdowns in the past three years, so it's important to look into these issues.

Cloud Takeaways

Cloud computing offers considerable savings, especially once you migrate to hybrid and public clouds. However, it's important to be able to answer some key questions and properly plan for the worst case.

Remember: Putting something in the cloud doesn't mitigate your responsibility for it. It doesn't go over well with compliance organizations when you try to explain, "The cloud ate your data."

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Key Questions

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What does the provider mean by backup and recovery? Is it just disaster recovery or will I be able to get back individual files?

Is data encrypted? If so how are the keys managed?

When I want data deleted what happens? Is it actually deleted or do they simply delete the encryption keys?

How will you meet data-retention requirements if the data is in the cloud?

What kind of change control and maintenance planning is in use? Do you get proactive notifications of maintenance activities, especially upgrades to software?

What are your key performance indexes? How do you plan to monitor the way you're being billed and whether service level agreements are being met?

What are your disaster-recovery or failover options? Make sure you understand the implications of different kinds of outages including regional or whole country outages.

Are they using standard APIs or will you be locked in if you move to this provider?

What are your fallback plans in case of a provider outage?

Does the vendor offer solutions to issues such as de-identifying data for trans-border data flow?

Can the movement of data be controlled?

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<http://www.redbooks.ibm.com/abstracts/redp4553.html>

Cloud Security Guidance

<http://www.redbooks.ibm.com/redpieces/abstracts/redp4614.htm>

Cloud Battle of the Titans

http://www.businessweek.com/print/magazine/content/11_11/b4219052599182.htm

Busting Cloud Myths

http://www.businessweek.com/print/technology/content/jun2009/tc20090622_355135.htm

Open Cloud Manifesto

<http://www.opencloudmanifesto.org/>

The Big Switch: rewiring the world from Edison to Google, Nicholas Carr SNIA – Managing Clouds for Data Storage

<http://www.snia.org/forums/csi/knowledge>

/CSI_Private_Hybrid_Cloud_White_Paper_final.pdf

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