



ARCHER SOLUTIONS SUMMARY:
“THE CLOUD”

Lately, we have been asked to review a number of general proposals provided to our clients for “Cloud” services and provide an analysis for management review. Based on the frequency of these questions, we thought it would be helpful to provide a general purpose educational summary. This is definitely an area that the technology management team has been closely monitoring and assessing for the last few years.

I think it would be useful to first review and explain what “the cloud” actually is. Let me begin by pointing out that “The Cloud” is a vague and sometimes overly broad term. It can mean anything from software accessed through the internet to internet hosted virtualized servers. In simple terms, “The Cloud” really just means “on the Internet” and involves moving some or all of a company’s systems and resources to equipment managed and operated by an internet-based third party provider.

One of the most common “cloud” scenarios is accessing software via the internet. While it has certainly become more popularized in the last few years, the concept of internet-based software has been around since the late 90s when it was called “Software as a Service” (SaaS). Whether you realize it or not, you are “in the cloud” when you use Hotmail, Google Docs, Salesforce and even Netflix. When you run a program and access data entirely on someone else’s systems via the internet, that’s “the cloud” in one sense of the term.

The other common usage for the term “cloud” is the technology of virtualization where physical servers can be transformed into a virtual software instance and be hosted on share resources with other virtual servers on shared hardware. Basically, instead of a separate computer for every server, it is possible to have many different servers running simultaneously together on shared servers and hard drives and able to dynamically shift loads and resources between them. The technology has been around for a number of years and is a proven solution, but it is also still a somewhat evolving technology. This is a revolutionary change that can provide for flexibility, redundancy, and far better resource allocation. It is not yet perfect, and there are some important limitations, but it is likely to be the next evolutionary step for IT over the next few years.

To further muddy the terminology waters, there are also varying degrees of “cloud” implementations available. There is a ‘pure’ cloud where all systems a company uses are online and hosted by a third party. This is most often used by very small offices, where there is less complexity or proprietary software and where there is less of a need to maintain physical control of the company’s data. There are ‘hybrid’ cloud implementations where some, but not all, systems are hosted online while other critical systems are kept in-house. The level and complexity of integration between online resources and local resources, security, connectivity and interoperability can be challenging. Lastly, there is also a ‘private cloud’ where cloud technologies and virtualization is used internally, but not hosted by a third party. This is most often seen with large companies or where strict control of company data is required.



There are pros and cons when looking at a 'cloud' based offering, and I outline them below, but it is worth noting that many companies have already begun implementing some 'private cloud' solutions and will be doing more as moving into 2013. For instance, many companies already have servers virtualized in-house or have already made key systems redundant and fail-over capable. Many have already have built a geographically disperse redundant wide-area network, or have set up co-location facilities for business continuity. And for nearly two decades, many companies have used Terminal Servers or Citrix to connect to firm systems and work via the internet from anywhere. Many of these solutions have been in place for years now, and are tried and trusted. In a lot of ways, 'the cloud' is already happening at many companies in a careful and controlled fashion. The only difference between what companies have been doing and "the cloud" in this context is that they haven't been handing off the actual equipment and hardware administration of core systems to an off-site third party.

Obviously the decision to do so must be made very carefully and with a full understanding of the consequences and costs. This is especially challenging when looking at expenses and ROI in the long term because cloud hosted services are monthly ongoing expenditures, whereas in-house systems tend to be heavier on up-front costs, with lower ongoing expenses beyond administration and maintenance. In many ways, it is the difference between buying and renting. There is not a 'right' answer; there is only the best cost benefit ratio for your particular circumstances.

In very simple terms, these are the pros and cons of "going to the cloud" (moving a company's systems and resources to a third party internet-hosted provider):

Pros:

1. In theory, you can offset in-house hardware costs for servers and storage by simply renting space on a third-party's existing infrastructure. Further, you can eliminate the support costs of hardware maintenance on these servers, as that becomes the responsibility of the third party hosting service. (However, you are really exchanging a one-time expense for a recurring monthly expense and while hardware maintenance costs are eliminated, this is often a minor expense overall and you still have to provide for at least some portion of administration of the software and systems. Further, large volume data storage also means an increased monthly expense that doesn't exist when you own the hardware)
2. Cloud based systems are generally available from anywhere at any time, and are highly redundant.
3. Scalability is much more flexible because you do not have to provision additional resources for processing power, memory, or additional hard drive space and install them on premise as more capacity is needed. Instead, you can simply increase your service level with the provider (at an increased monthly cost). This can significantly reduce the time needed to upgrade or expand your systems.
4. General Security can often be better at a cloud host where they (presumably) have **dedicated** teams of experts to protect all of their systems and infrastructure and as a result you benefit from that effort. (Note this still provides no protection from weak passwords or



program vulnerabilities). On the flip side, large cloud hosting sites are much more likely to be targeted.

Cons:

1. Because these systems are accessible via the internet, they are subject to internet outages, both at the hosting site, and at your own offices. As we know all too well, the internet can, and does, go down. Further, even the best and biggest cloud hosting companies with extensive redundancies and failover in place still experience significant outages, and if a company has all of their resources at a hosted service, that means everything becomes unavailable and the business cannot function. You can read [CNN's article here](#) for more information.
2. Bandwidth is the elephant in the room for cloud-based solutions. With everything that a user needs to access available only through the internet, you must provision a lot more bandwidth to ensure that there is enough data transfer capacity for everyone working at the same time. Files and data that must be moved back and forth constantly for every user every minute of the work day, and that means more substantially more internet traffic. This is also an exponentially expanding problem when dealing with large amounts of data, and slower performance can be a significant problem is not properly provisioned. This is a hidden cost often glossed over by cloud salespeople.
3. Despite the promise of simplification for cloud-based small offices, the reality for mid-size businesses and businesses with specialized software is that not all systems can be moved to the cloud, and inter-connecting local on-site systems with internet hosted systems and guaranteeing smooth interoperability can be very complex and challenging.
4. Data Control is also an extremely important concern. Obviously, when your systems are being hosted by a third party along with countless other people's key data, you must completely rely on them to safely and correctly protect, safeguard and partition your data away from anyone else, including the third-parties own staff, which may or may not even be in the same country. This becomes even more concerning when redundancy replication means that your proprietary and confidential information may be replicated across multiple different systems. Except at the higher end of custom cloud implementations, clients have little or no control over how their data is handled, and you are often sharing servers and storage with any number of other companies. There are obviously safeguards and assurances made, but it requires a great deal of trust and there are often limited auditing capabilities for you to confirm or verify that your data is being handled appropriately.
5. Data ownership and reclamation is another serious concern. Once you have moved your business to a third-party host, it can be difficult or impossible to change providers or come back from "the cloud". If your provider goes out of business, how can you continue to work with all of your assets and resources off-site? If your provider decides to raise their rates, how can you leave to another provider when they have custody of your entire business? What happens in the event of a billing dispute where they can simply shut down your business or discard your information for lack of payment? If you do manage to depart, what assurances are there that your company's data is correctly and completely deleted from the host's systems? Who is legally responsible for a data breach if one occurs? Once you have shed your



in-house servers and infrastructure, how expensive would it be if you decided to bring your systems back in-house? These concerns can be addressed, but they require intense scrutiny, and are often not adequately addressed in standard hosting agreements.

6. Regulatory compliance concerns. Many companies have significant compliance concerns for storage, protection, and access of data including PCI, HIPPA, Sarbanes-Oxley and EU regulatory requirements. Most shared cloud hosting offerings do not meet these requirements, because they share servers and storage amongst multiple clients and servers and storage is not physically partitioned. Many of the larger cloud hosting companies do provide options for physical segregation and compliant solutions are available but at significant additional expense.

For these reasons, the technology management team does not usually recommend a company-wide transition to ‘the cloud’ at this time, though we will continue to monitor this promising and evolving technology. This should not be interpreted to mean that we do not recommend cloud services – we often do. However, it must be addressed carefully on a case-by-case basis and must meet a specific functional need not met by existing systems or provide a compelling cost savings without negatively impacting productivity or capabilities of the company. Despite sales hype and marketing, we often find that this is only applicable in certain instances with special circumstances. We expect that as the “cloud” industry continues to evolve and mature, we will see more and more of these issues satisfactorily addressed and that it will continue to become a viable alternative for more businesses. We will continue to implement many “cloud” technologies such as virtualization and shared storage internally, leveraging many of the technology advancements while eschewing the use of a third-party internet based host until the situation changes.

Lastly, it is critical that when your company considers transitioning some portion of applicable services to a third-party cloud host, we would want to select a vendor partner that has the proven history, resources, and area-specific expertise to provide the support we will need.

I hope this analysis has been helpful and informative, and as always I am at your disposal if you have any questions.

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