

CLOUD COMPUTING – WHAT IT IS AND WHAT IT ISN'T

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Cloud Computing is the latest technology to appear in the media that will apparently “change everything”. This is not strictly true, but as people begin to understand what it really means (and hopefully this paper will help), they will appreciate that some of the advantages and benefits are valid.

Therefore, a little more clarity regarding this subject may be useful and helpful. Particularly when dealing with companies claiming to provide these services.

WHAT IS 'THE CLOUD'?

Since the advent of data communications some 50 years ago, most of the people involved in marketing these networks have depicted them as cloud shaped entities. This was easier and faster than trying to draw the very complex and often incomprehensible diagrams that network engineers usually worked with. As a result, when the Internet and the World Wide Web migrated from the lab into the real world, any connections to it were drawn as lines into a cloud shaped body. The description 'Cloud Computing' was adopted to describe computing services accessed or delivered over the Internet.

In truth, very few people have any clue what the internet is and how it works. They understand when they access their bank account, or book an airline ticket online, that this is done via 'The Web', using either the Broadband service from home or on their mobile phone. But how the data gets to where it's going and how the responses get back to them, they couldn't care less and, as long as it is secure and they get the result they want, they don't need to know.

Being able to access information quickly and easily from any location has revolutionised the way in which we connect, communicate and do business. Compared to the expense and difficulty companies had trying to develop their own communications networks years ago, the situation today is several magnitudes cheaper and easier. But as I hope to explain, this progression is now extending beyond connectivity to different systems, into what those systems are becoming, how they work and where they are located.

To briefly recap, 'The Cloud' is simply a description for the Internet and any services accessed by connecting to it.

Note: There are some large companies that provide access to their private communications networks using similar technologies. These are frequently described as 'Private Clouds', but they only make financial sense for some global corporations, Governments and the Military.

SO WHAT IS CLOUD COMPUTING?

What it is NOT, is being able to access your existing systems running on servers or computers you own, in your offices, remotely through the Internet. This is just remote access.

This is where a lot of confusion arises. Many vendors describe solutions they provide as 'Cloud Services', or 'Cloud Hosting'. What they really mean is that instead of you installing and running the computer servers in your offices, they are located in their offices, or occasionally, in racks in a local data centre operated by another specialist company. But you essentially still 'own' the servers. While there may be advantages to doing this, this is not 'Cloud Computing'.

It makes a great deal of sense to have the people that develop your systems close to them for servicing and upgrades. This is primarily so they can respond quickly when anything goes wrong. It makes even more sense for small companies to have their systems supplier look after the servers directly, so they don't need to dedicate existing staff or employ their own systems specialists to take care of the equipment.

This trend has been growing as the Internet becomes more reliable and everyone becomes more relaxed about accessing sensitive data remotely. But having your systems supplier look after the equipment running your business, while located in their office is not new. This was originally described as Remote Application Hosting or Application Service Provision (ASP) and was quite common in the early part of this century.

Although a number of companies built large data centres to house the servers used to provide these solutions, many of them failed commercially. However, the benefits of resilient operations they provided were, and remain, valid. Backup power supplies, secure access and robust links into the Internet, all became important considerations as companies appreciated how much they now depended on information systems.

But these were not, are not and should not, be described as 'Cloud Computing' solutions.

They are simply 'Hosted' solutions, because although they may be housed away from the organisation using them, they are still running on the servers, applications and databases dedicated (and purchased, rather than rented) specifically to them.

This difference is key to understanding what 'Cloud Computing' and 'Cloud Services' are and why, economically, it will make a huge difference to the way organisations exploit information technology.

Cloud Computing is all about information systems and services being available as a 'Utility', in the same manner as water, gas and electricity. These public utilities are operated by specific suppliers and their product is delivered across a common infrastructure. Users do not care how many miles of pipeline, valves or wire are used in getting the water or energy to them. They just want it when they want it and pay only for how much they use.

The resources necessary to deliver computing services in a similar manner are considerable and therefore beyond the reach of most vendors. Unsurprisingly, the biggest players in the market at the moment are Amazon Web Services, Microsoft and Google. IBM, HP and a few specialists are also expanding their efforts to compete with them.

INFORMATION SERVICES AS A 'UTILITY'

So what's involved in providing information services as a 'Utility'? Essentially, it means ensuring that the amount of processing and storage any user may require, at any time, is available to them for as long as they need it. This has huge implications for the way hardware, databases and applications are configured.

When most companies want to add additional users, or expand, or upgrade applications and databases, the process requires planning, additional hardware purchases and software license negotiation. This all takes some time to conclude, often at significant expense.

In a Cloud Computing environment, if you need to add users or access increased processing power, you just request it online and it's usually available within minutes. When you have completed that task, you can revert back to your existing configuration just as easily. The costs are reflected on the monthly invoice from the provider and usually only cover what you have used for the time you use it.

Users never know, or need to know, where the servers are, or where their data is processed. If they make the same request five minutes later, the chances are that a completely different set of servers will be involved. But this does not matter and the users do not care.

It must also be noted that this does not in any way compromise security. User data, customer data and other proprietary information is at least as secure as it is in other systems. The difference is how it is controlled and managed across these shared system services. They are only 'shared' in terms of being shared across system resources allocated by the controlling programmes, rather than the data being 'shared' outside of your organisation.

Another big change is that users should be able to select from a range of applications, from a range of software suppliers, sign up and get going. Some even provide the 'Try before you buy' option.

This is very different to what usually happens, with companies deciding what applications they want to run in their major operations, selecting the vendors, requesting a proposal from each one, doing the cost benefit analysis and then selecting the winner. This is then followed by months of negotiating the price, developing the implementation plan, training the users and deploying the application in the business. The time and cost involved is huge.

Salesforce.com and Workday.com have proven that this model is now obsolete through their spectacular growth. Their customers are using their enterprise-class applications to serve thousands of users, with selection, sign-up, training and implementation, all done online, adding new users within minutes ([Information Week UK](#)).

This approach is completely different to the way a majority of organisations exploit information systems now. It also raises some interesting questions for liability and compliance legislation as it cuts across many of the prevailing norms. But the operating costs to the users are often fractions of the conventional models. This is one of the reasons SAP developed their Business By-Design solution ([ZDNet](#)).

Needless to say, very few applications currently used in the Logistics industry are designed to operate in this manner and to do so they will need to be completely redeveloped. The underlying technologies used by the Cloud vendors are themselves very different. They use modern, open source technologies, database and programming languages designed specifically for these environments.

Google for example, has long used their own server designs, essentially just a few chips on a board (cheap, fast and disposable) arranged by the hundred, in 20 ft shipping containers bolted together ([Wired](#)). When a majority of the boards have failed in a box, it's just unplugged, removed and replaced by another, with the removed one heading for recycling.

Amazon's EC2 (Elastic Compute Cloud) has a huge range of services available to help customers and developers, design and build solutions to run as Cloud Services delivered from Amazon Cloud Data Centres ([Amazon Web Services](#)). Many major corporations are exploring how they can leverage this emerging trend to cut costs and improve customer service.

Amazon, Google, Apple and others have established huge, anonymous data processing facilities around the world, all interconnected with almost 100% availability and uptime, as the platform for these services. They continue to invest billions in this effort and Amazon has already acknowledged that their AWS division is already generating \$1.5bn in revenues and continues to grow faster than projected.

To further illustrate the point, how many Gmail or Hotmail users know where the servers holding their email are located? Indeed, many corporate email systems use Gmail as their underlying platform for their operation. Google App services allow companies to host all of their corporate email and productivity apps on their servers, without changing their existing .com, .net or any other domain name. Most users and correspondents are completely unaware they are running on Gmail.

Many of the software start-ups are designing their applications and services specifically for these Cloud platforms. The business model for using these services is by subscription or by transaction. It allows the very small, innovative, developers to deliver solutions across the globe and at scale that previously, could only be done by much larger companies. The explosion of 'Apps' available via Apple's 'App Store' is a great illustration of how users can select from a range of capabilities, download them and begin using them. Enterprise applications will be available in a similar manner. SAP already has an iPhone "App for that!"

As these services develop and users continue to find and select applications online and download onto any device, it will challenge existing cost structures. It is particularly challenging to established IT

departments, who will struggle to justify spending money on internal hardware and licensed applications that may only be used for less than 50% of the time. They will need to become advisors and champions of how users can migrate and exploit these services.

Existing application vendors should already be reviewing how they can redevelop and migrate their applications (and users) into a real Cloud Computing environment. Not just offering to transfer users existing servers from their offices into a local data centre and claiming they are now Cloud solutions.

Legal departments of major corporations should consider how much they understand about the challenges that true ubiquitous computing services will pose to the way they operate.

Finance Directors and CFO's need to appreciate that technology is migrating from a CapEx to OpEx, becoming a line item in the ledger just like water, power and phones.

As I said at the beginning, there is a large amount of hype and misinformation surrounding this topic. Much of this can be attributed to confusion in the market and a lack of a real understanding for the fundamental principles involved by both users and, in some cases, by vendors. Companies should begin to try and learn more about how they can exploit these developments and how they can prepare themselves to adapt to this environment. Done well, it should bring cost advantages and enhance, perhaps transform how they work.

About the Author

Ken Lyon is a long term innovator in the development of collaborative supply chain networks and communities. He is a recognised industry expert, experienced public speaker, government advisor and technology consultant.

Ken is a Member of the Advisory Board for Transport Intelligence, specialising in Technology. In addition, Ken is Managing Director of Virtual Partners.

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