White Paper: Introduction to cloud computing

The boom in cloud computing over the past few years has led to a situation that is common to many innovations and new technologies: many have heard of it, but far fewer actually understand what it is and, more importantly, how it can benefit them. This whitepaper will attempt to clarify these issues by offering a comprehensive definition of cloud computing, and the business benefits it can bring.

In an attempt to gain a competitive edge, businesses are increasingly looking for new and innovative ways to cut costs while maximising value – especially now, during a global economic downturn. They recognise that they need to grow, but are simultaneously under pressure to save money. This has forced the realisation that new ideas and methods may produce better results than the tried and tested formulas of yesteryear. It is the growing acceptance of innovative technologies that has seen cloud computing become the biggest buzzword in IT.

However, before an organisation decides to make the jump to the cloud, it is important to understand what, why, how and from whom. Not all cloud computing providers are the same. The range and quality of services on offer varies tremendously...

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What is ‘cloud computing’?

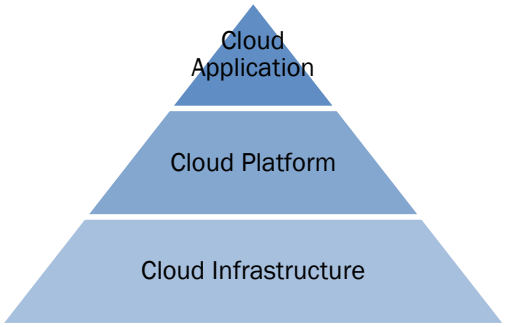
Many people are confused as to exactly what cloud computing is, especially as the term can be used to mean almost anything. Roughly, it describes highly scalable computing resources provided as an external service via the internet on a pay-as-you-go basis. The cloud is simply a metaphor for the internet, based on the symbol that’s used to represent the worldwide network in computer network diagrams.

Economically, the main appeal of cloud computing is that customers only use what they need, and only pay for what they actually use. Resources are available to be accessed from the cloud at any time, and from any location via the internet. There’s no need to worry about how things are being maintained behind the scenes – you simply purchase the IT service you require as you would any other utility. Because of this, cloud computing has also been called utility computing, or ‘IT on demand’.

This new, web-based generation of computing utilises remote servers housed in highly secure data centres for data storage and management, so organisations no longer need to purchase and look after their IT solutions in-house.

What does it comprise of?

Cloud computing can be visualised as a pyramid consisting of three sections:



Cloud Application
This is the apex of the cloud pyramid, where applications are run and interacted with via a web browser, hosted desktop or remote client. A hallmark of commercial cloud computing applications is that users never need to purchase expensive software licenses themselves. Instead, the cost is incorporated into the subscription fee. A cloud application eliminates the need to install and run the application on the customer's own computer, thus removing the burden of software maintenance, ongoing operation and support.

Cloud Platform
The middle layer of the cloud pyramid, which provides a computing platform or framework as a service. A cloud computing platform dynamically provisions, configures, reconfigures and de-provisions servers as needed to cope with increases or decreases in demand. This in reality is a distributed computing model, where many services pull together to deliver an application or infrastructure request.

Cloud Infrastructure
The foundation of the cloud pyramid is the delivery of IT infrastructure through virtualisation. Virtualisation allows the splitting of a single physical piece of hardware into independent, self governed environments, which can be scaled in terms of CPU, RAM, Disk and other elements. The infrastructure includes servers, networks and other hardware appliances delivered as either Infrastructure “Web Services”, “farms” or "cloud centres". These are then interlinked with others for resilience and additional capacity.

Types of Cloud Computing

Public Cloud
Public cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned on a fine-grained, self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who shares resources and bills on a fine-grained utility computing basis

An example is Cloudserve, who provide a multi-tenant architecture for providing services such as Hosted Desktops, Software as a Service and Platform as a Service. Other popular cloud vendors include Salesforce.com, Amazon EC2 and Flexiscale.

Private Cloud
Private cloud (also called internal cloud or corporate cloud) is a marketing term for a proprietary computing architecture that provides hosted services to a limited number of people behind a firewall. Advances in virtualization and distributed computing have allowed corporate network and data centre administrators to effectively become service providers that meet the needs of their "customers" within the corporation. Marketing media that uses the words "private cloud" is designed to appeal to an organization that needs or wants more control over their data than they can get by using a third-party hosted service.

An example of private clouds generally exist in large blue chip organisations who will buy private clouds from companies such as IBM to run distributed SAP or Oracle services.

Hybrid Cloud
A hybrid cloud environment consists of multiple internal and/or external providers will be typical for most enterprises. A hybrid cloud is a cloud computing environment in which an organisation provides and manages some resources in-house and has others provided externally. For example, an organization might use a public cloud service for general computing but store customer data within its own data centre.

Although cloud computing is often said to be the future of the industry, the hybrid model is more prevalent for a number of reasons. Large enterprises often already have substantial investments in the infrastructure required to provide resources in-house. Furthermore, many organisations would prefer to keep sensitive data under their own control to ensure security.

Why switch from traditional IT to the cloud?

There are many reasons why organisations of all sizes and types are adopting this model of IT. Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Ultimately, it can save companies a considerable amount of money...

Removal / reduction of capital expenditure

Customers can avoid spending large amounts of capital on purchasing and installing their IT infrastructure or applications by moving to the cloud model. Capital expenditure on IT reduces available working capital for other critical operations and business investments. Cloud computing offers a simple operational expense that is easier to budget for month-by-month, and prevents money being wasted on depreciating assets. Additionally, customers do not need to pay for excess resource capacity in-house to meet fluctuating demand.

Reduced administration costs

IT solutions can be deployed extremely quickly and managed, maintained, patched and upgraded remotely by your service provider. Technical support is provided round the clock by reputable providers like Cloudserve for no extra charge, reducing the burden on IT staff. This means that they are free to focus on business-critical tasks, and businesses can avoid incurring additional manpower and training costs. Cloud computing allows individuals, teams, and organizations to streamline procurement processes and eliminate the need to duplicate certain computer administrative skills related to setup, configuration, and support.

Improved resource utilisation

Pooling resources into large clouds drives down costs and increases utilisation by delivering resources only for as long as those resources are needed. Businesses and developers need not be concerned about over-provisioning for a service whose use does not meet their predictions, thus wasting costly resources, or under-provisioning for one that becomes wildly popular, thus missing potential customers and revenue. Move more and more applications, infrastructure, and even support external to your company and into the cloud. This can free up precious time, effort and budgets to concentrate on the real job of exploiting technology to improve the mission of the company. Make better use of your time. It really comes down to focusing on your business and allowing cloud providers to manage the resources to get you to where you need to go. Sharing computing power among multiple tenants can improve utilisation rates, as servers are not left idle, which can reduce costs significantly while increasing the speed of application development. A side effect of this approach is that computer capacity rises dramatically, as customers do not have to engineer for peak loads.

Economies of scale

The economies of scale enjoyed by cloud computing providers, who typically use very large-scale data centres operating at much higher efficiency levels... allowing them to pass on savings to their customers.

Scalability on demand

Scalability and flexibility is a highly valuable advantage offered by cloud computing. It allows you to respond quickly to changing IT needs, adding or subtracting capacity and users as and when required. Even better, because cloud-computing follows a utility model in which service costs are based on actual consumption, you only pay for what you use. Increase capacity based on real rather than projected needs. This elasticity of resources, without paying a premium for large scale, is unprecedented in the history of IT.

Quick and easy implementation

Without the need to purchase hardware, software licences or implementation services, a company can get its cloud-computing arrangement off the ground in minutes.

Helps smaller businesses compete

Cloud computing has made it possible for small companies to compete on an even playing field with much bigger competitors. 'Renting' IT services instead of investing in hardware and software makes them much more affordable, and means that capital can instead be used for other vital projects. There's a huge gap between what's available to small businesses and enterprises. Providers like Cloudserve take enterprise technology and offer SMBs services that would otherwise cost hundreds of thousands of pounds for a low monthly fee.

Quality of service

Your selected vendor should offer 24/7 customer support and an immediate response to emergency situations.

Guaranteed uptime, SLAs.

Reliability and guaranteed service levels to ensure you applications and or services are online and accessible.

Anywhere Access

Cloud-based IT services let you access your applications and data securely from any location via an internet connection. It's easier to collaborate too; with both the application and the data stored in the cloud, multiple users can work together on the same project, share calendars and contacts etc. It has been pointed out that if your internet connection fails, you will not be able to access your data. However, due to the 'anywhere access' nature of the cloud, users can simply connect from a different location – so if your office connection fails and you have no redundancy, you can access your data from home, the nearest Wi-Fi enabled point. Because of this, flexible / remote working is easily enabled, allowing you to cut overheads, meet new working regulations and keep your staff happy!

Technical Support

A good cloud computing provider will offer round the clock technical support. Cloudserve customers, for instance, are assigned one of our support pods, and all subsequent contact is then handled by the same small group of skilled engineers, who are available 24/7. This type of support model allows a provider to build a better understanding of your business requirements, effectively becoming an extension of your team.

Disaster recovery / backup

Recent research has indicated that around 90% of businesses do not have adequate disaster recovery or business continuity plans, leaving them vulnerable to any disruptions that might occur. Providers like Cloudserve can provide an array of disaster recovery services, from cloud backup (allowing you to store important files from your desktop or office network within their data centres) to having ready-to-go desktops and services in case your business is hit by problems. Hosted Desktops (or Hosted VDI) from Cloudserve, for example, mean you don't have to worry about worry about data backup or disaster recovery, as this is taken care of as part of the service. Files are stored twice at different remote locations to ensure that there's always a copy available 24 hours a day, 7 days per week.

Should I be concerned about the security?

Many companies that are considering adopting cloud computing raise concerns over the security of data being stored and accessed via the internet. What a lot of people don't realise is that good vendors adhere to strict privacy policies and sophisticated security measures, with data encryption being one example of this. Companies can choose to encrypt data before even storing it on a third-party provider's servers. As a result, many cloud-computing vendors offer greater data security and confidentiality than companies that choose to store their data in-house. However, not all vendors will offer the same level of security. It is recommended that anyone with concerns over security and access should research vendors' policies before using their services. Technology analyst and consulting firm Gartner lists seven security issues to bear in mind when considering a particular vendor's services:

1. Privileged user access—enquire about who has access to data and about the hiring and management of such administrators
2. Regulatory compliance—make sure a vendor is willing to undergo external audits and/or security certifications
3. Data location—ask if a provider allows for any control over the location of data
4. Data segregation—make sure that encryption is available at all stages and that these "encryption schemes were designed and tested by experienced professionals"
5. Recovery—find out what will happen to data in the case of a disaster; do they offer complete restoration and, if so, how long that would take
6. Investigative Support—inquire whether a vendor has the ability to investigate any inappropriate or illegal activity
7. Long-term viability—ask what will happen to data if the company goes out of business; how will data be returned and in what format

Generally speaking, however, security is usually improved by keeping data in one centralised location. In high security data centres like those used by Cloudserve, security is typically as good as or better than traditional systems, in part because providers are able to devote resources to solving security issues that many customers cannot afford.

What about integration?

In order to make the most of your existing IT provision, the cloud computing services you decide to subscribe to should be able to integrate easily with your current infrastructure. Key to Cloudserve's enterprise offerings is being able to easily integrate with customers' existing networks, so that our services become a seamless extension of those already provided by in-house IT departments. Cloud computing infrastructure should allow enterprises to achieve more efficient use of their existing IT hardware and software investments.

Cloudserve works with many channel partners to provide an end-to-end solution to small businesses, so if a company wishes to evaluate, plan migrations and move towards cloud computing, this can be done quickly and simply, hand in hand.

Conclusion

When your business grows, your IT needs grow too. The scalability offered by cloud computing means that you can expand your IT provision instantly to meet increased requirements, and you can also scale it down again whenever you want. The flexibility and responsiveness of cloud-based IT services mean that you can react quickly to a changing business environment. Waste (of both time and resources) is reduced, allowing you to effectively do more with less. This provides you a leaner, more efficient IT model, available on demand.

About Cloudserve

Cloudserve provides Cloud Computing Service to Small and medium sized businesses. Launched in 2008 with the aim of disrupting the way that businesses currently purchase, use and manage IT, Cloudserve provides enterprise class IT to small and medium businesses. Cloudserve removes the management and cost burden of owning IT by offering it to customers as an on demand service. Its current services include Hosted desktop, Exchange, VoIP, Hosted Blackberry Enterprise Service and Dynamic Server Infrastructure. With Cloudserve, each employee is given their own personalised hosted virtual desktop that can be accessed from anywhere in the world through an Internet connection. Cloudserve customers only pay for what they use, based on the needs of the business and can scale up and down at the click of a mouse. For more information visit http://www.Cloudserve.co.uk/.