

Top 5 things you should know about Cloud Computing

(1) What is Cloud Computing?

Cloud computing is a way providing the delivery of documents, applications, emails and data through the internet from servers hosted at data centres to the end users in their web browsers.

It essentially gives users access to all their information and daily working practices through the internet from their desktop, laptop or mobile device, such as an iPhone, iPad, PC or laptop.

Cloud Computing uses large scale datacentres to house all the applications and data. The information is streamed down the user via internet communications, such as ADSL, Leased lines, Fibre or over Wireless devices.

Businesses leverage the benefits of not having to build their own infrastructures for the hosting of software(s) or development areas in data centres, whilst having the capability to turn the service on or off or flex it up or down, without the risk of the larger time and cash investments.

Service providers deliver flexible access to infrastructure, development platforms and software applications from these data centres and businesses subscribe to one or more of their services, generally on a per user, time and capacity usage basis. I'll explain more about this as we progress with some examples of various providers and their charge mechanisms.

In simple terms, because the services are in cloud and accessed over the internet, any internet devices can connect to the them, assuming they have enough bandwidth connection speed and a browser (IE, Chrome, Firefox, Safari) on their device. E.g. Mobile handsets, iPads, Blackberrys, iPhones, laptops, PC's, terminals etc.



Devices connecting to the data centre

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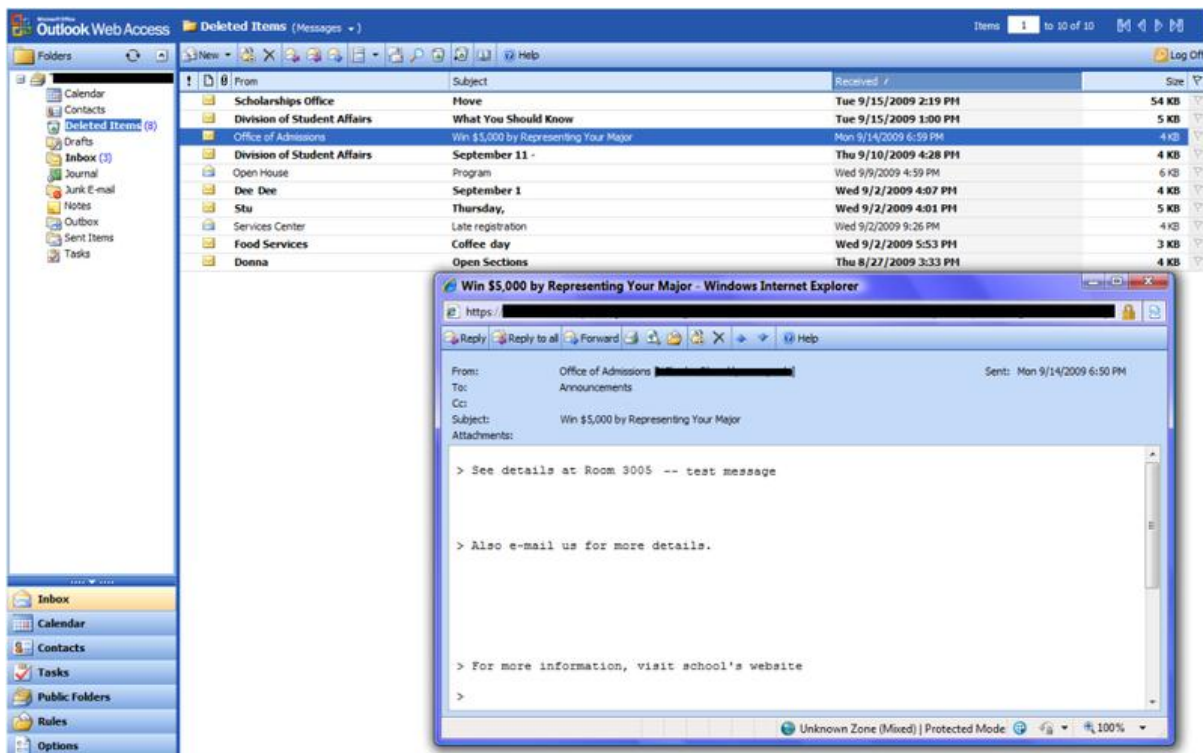
(2) What are the Cloud Computing service models?

Essentially, there are three service models that prevail in the market, as follows:-

(2.1) Software as a Service (SaaS)

This is the most common of the three and utilises software running on a Cloud based infrastructure giving users the ability to perform their usual work in an application that is presented to them through a web browser. All the data that the user works on within the application is actually sitting on the server(s) in the data centre, so the user can connect to it from anywhere in the world, as long as they have their login credentials and a web browser internet access. A great example of this is Salesforce CRM, where the user logs into the application with a user-id and password through a web browser session by typing in <https://login.salesforce.com/>. Other SaaS examples are Microsoft BPOS (Business Productivity Online Suite, which includes Exchange, SharePoint, Live Meeting and Communicator) and Google Apps.

Some applications do have a local client, such as Outlook connecting to a hosted Exchange server that is located in the cloud. The overriding common theme however, is that the data is stored on a server in a large data centre and can be accessed through a browser, so it's not dependant on having Outlook installed on your desktop as there is an Outlook web client you can use for access through Internet Explorer, Chrome or another browser.



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Another equally distinguishing feature of Cloud Computing SaaS is the ability for software to be published to multiple businesses under their own segmented domain and charged discretely. The business may well be accessing the application that is published to multiple businesses but the beauty of SaaS is that it allows applications to be multi-tenanted without any interference between each business. So take for example a user from company A connects to the same application (i.e. Salesforce) in the cloud as a user from Company B but they are completely independent of each other and are completely segregated within the application, so never the twain meets. ISV's (Independent software vendors) have to convert their application to be multi-tenanted as they migrate or develop for the Cloud.

(2.2) Platform as a Service (PaaS)

This enables businesses to develop Cloud based software applications (again a good example is Salesforce), using specific programming languages, development frameworks and tools then deploy them onto a Cloud infrastructure. The platform is accessed across a private network or the internet and used to build applications rather than owning, running and developing on an internal IT infrastructure.

The software and the hardware within the cloud infrastructure are called 'Cloudware' and are accessed through the web. Multiple types of the development software can sit on different cloud infrastructure but all combining to give their specific application solution.

It's probably useful for all readers to understand that a Platform describes a software framework or multiple pieces of software, sitting on a hardware (multiple virtualised servers) framework, that allows software to run in this manner. It's frequently described as a stack, so the bottom level is the infrastructure stack, then the platform stack sits on top of this, literally installed on it. A common platform in computing is the LAMP stack (this is an acronym for the following), Linux (operating system), Apache (Web server), MySQL (Database), and PHP stack (Development Language) combined to make the LAMP stack. E.g. Ruby on rails [Ruby on Rails](#) is the development product which sits on Herokus platform [Heroku](#). Other cloud platform providers include [Google app engine](#), which supports Java and Python (development languages), and [Engine Yard](#), which supports Ruby on Rails.

Cloud PaaS suppliers, supply these familiar platform stacks to users, without the need for them to maintain the underlying hardware or upgrade the supporting software, so the benefit being all they need is in one place, ready to write their applications and publish them in the cloud.

With PaaS, the user doesn't manage the underlying infrastructure themselves but they do control all the applications that are developed on it and the code that they write.

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(2.3) Infrastructure as a Service (IaaS)

This provides businesses with virtual resources located at data centres. E.g. storage (server space), networking hardware, processing power, and other infrastructure services. The massive stacks of hardware servers built in the data centres and virtualised to create private clouds or public clouds using software, such as [VMware vSphere](#), [Citrix XenServer](#) or [Microsoft's Hyper-V](#).

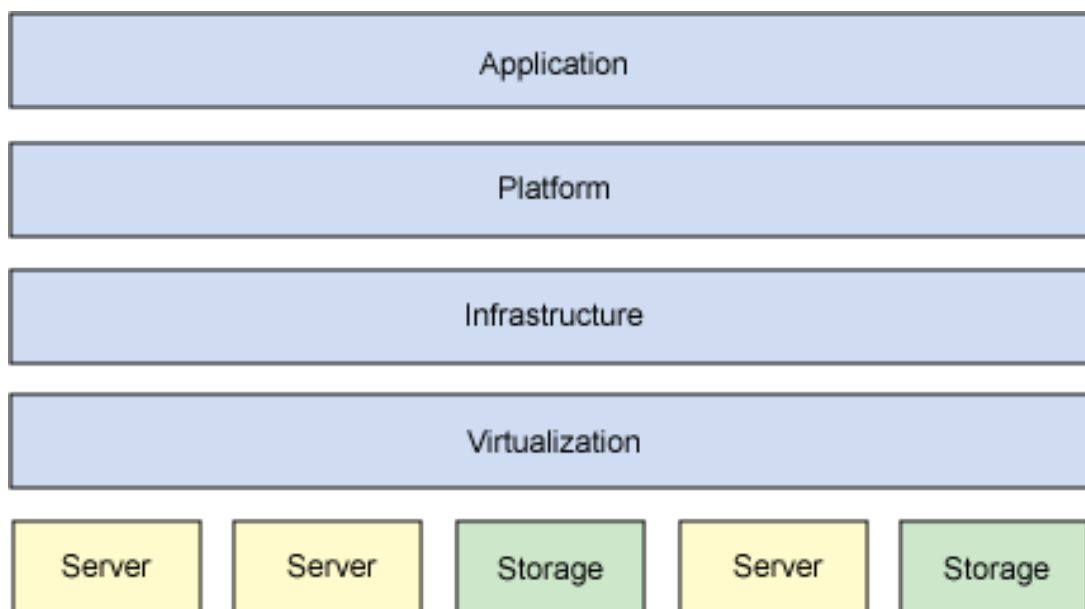
IaaS generally means a company can rent server space/capacity, from an IaaS service provider and use it across the internet, rather than having an amount of IT infrastructure on their own premises.

Again the business doesn't control or manage the infrastructure but they do have control over the operating systems, the applications, the capacity (storage and processor) and the development frameworks.

The key benefit is that the business can buy as much capacity as they need and grow or shrink it as required, which means they don't need to invest in large racks of hardware, merely rent (or subscribe to) what they need, when they need it.

Typical providers of IaaS are:-

- [Amazon EC2](#)
- [Go Grid](#)
- [Rackspace](#)



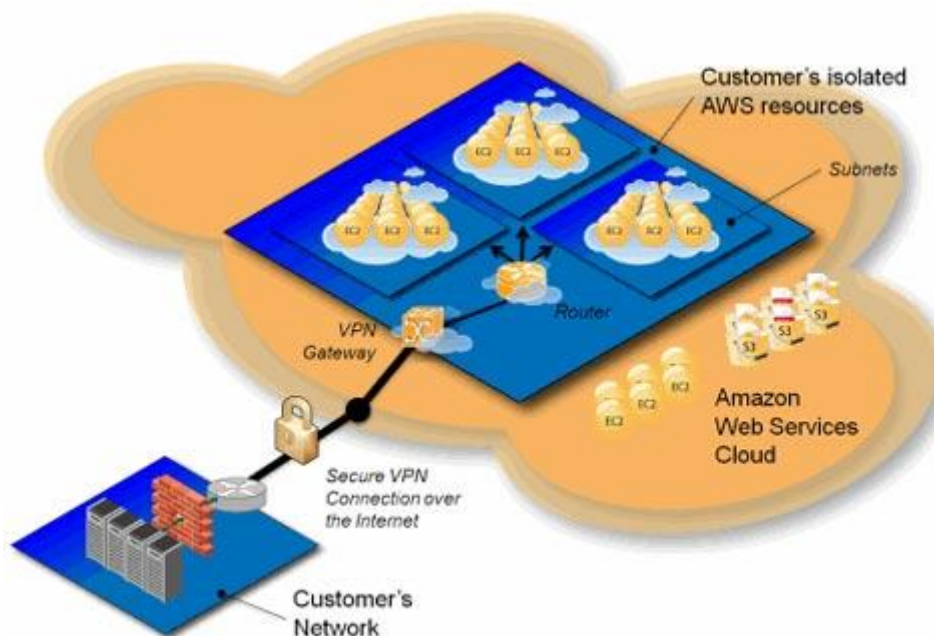
An example of the service stacks.

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(3) How are the different service models deployed?

(3.1) 'Private Clouds' are operated purely for one business, organisation or entity. The business may manage the private cloud structure themselves or indeed have a third party MSP (Managed Service Provider), such as [TechQuarters](https://www.techquarters.com) to manage it for them. The MSP may specify the configuration and perform a 'migration' or 'build and deploy' project for the client. Another key factor about Private Clouds is that they can sit internally within their own data centre or indeed be located at a 3rd party data centre within their own Virtual Private Cloud accessed through a Virtual Private Network (VPN) connection. However, generally the kit is bought, built and deployed by the business itself and located in its own IT infrastructure network.



A secure Virtual Private Cloud hosted within the Amazon Public Cloud infrastructure

(3.2) 'Public Clouds' are basically the general standard for Cloud Computing, where service providers deliver storage, applications, infrastructure and platforms to businesses. Users of public cloud infrastructures pay on a per usage model by hours of use, capacity and user subscriptions. E.g. [Amazon Web Services](https://aws.amazon.com)

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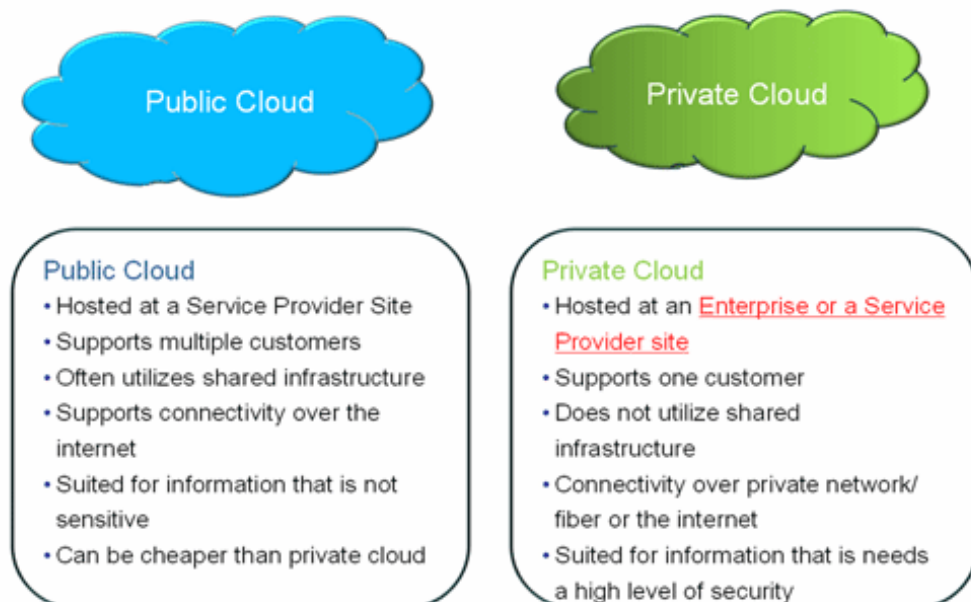
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The key difference between public and private is as one would expect 'Public' means typically the groups of users are from independent businesses and have their own segregated secure areas, which are virtualised portions of the massive configurations of servers on servers in 3rd party data centre warehouses. These are developed for the provision to any user or business who subscribes to it, however the private cloud is an infrastructure specifically designed and secured to that business or organisation on their own dedicated infrastructure. Public Clouds are essentially virtualised environments that users access through a turn on, turn off mechanism.

Typical providers of Public Cloud services would be Google, Amazon Elastic Compute Cloud (EC2), Microsoft Online Azure, Elastic hosts, IBM's Blue Cloud.

Public Clouds are typically priced on per usage basis over time. E.g. Amazon Elastic Cloud EC2 charges \$0.01/hour for an Amazon Machine Instance (AMI). On top of this you may then select Amazon Elastic Block Store (EBS) for \$0.10 per allocated Gb per month and then an archive data store from Amazon Storage (S2) for \$0.150 per GB/month of storage.

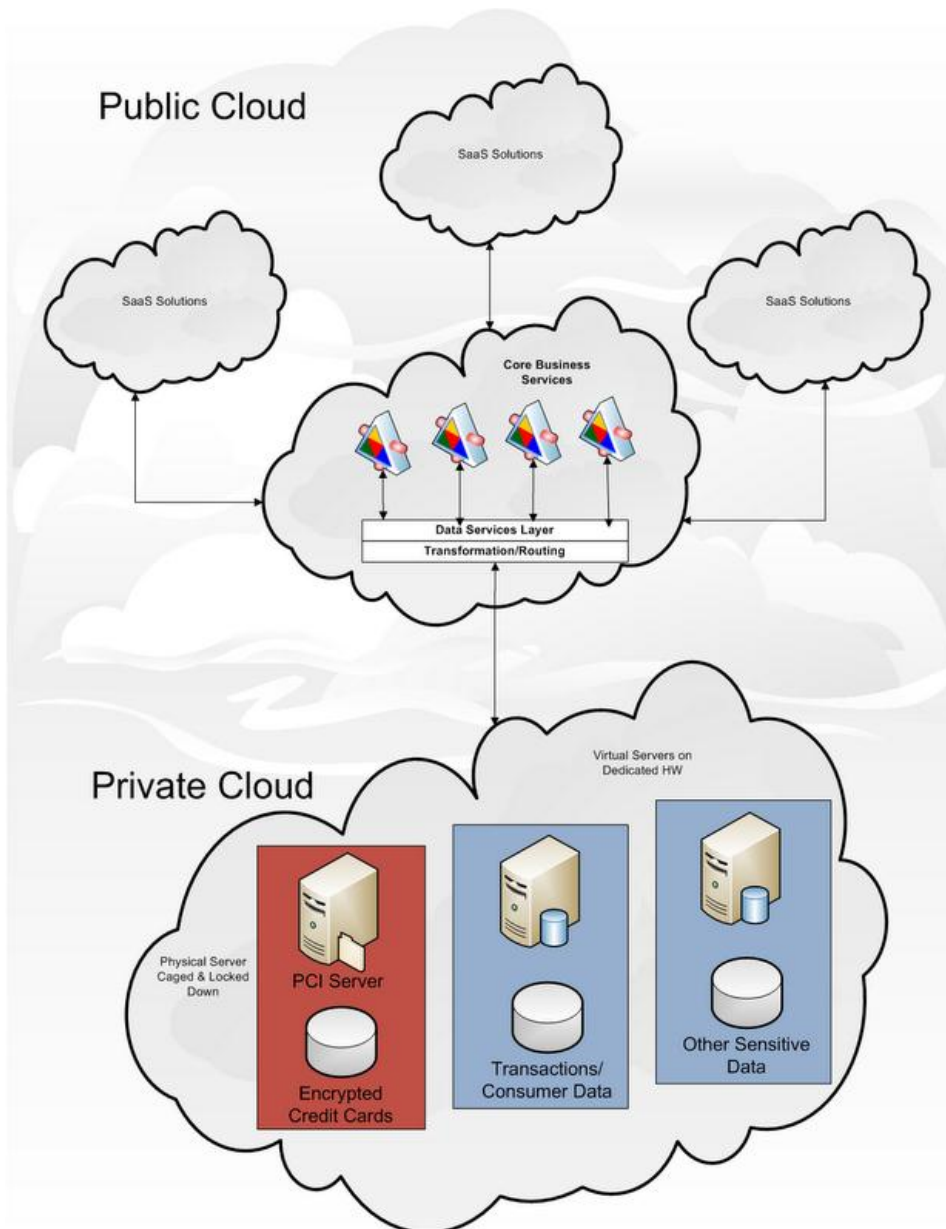
'On-Demand Instances let you pay for compute capacity by the hour with no long-term commitments. This frees you from the costs and complexities of planning, purchasing, and maintaining hardware and transforms what are commonly large fixed costs into much smaller variable costs.' Amazon Web services (EC2, Elastic Cloud 2)



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(3.3) 'Hybrid Clouds' combine private and public clouds. Depending upon the functional requirement, the business might choose to have it's operational data on a private cloud but use the benefits of the low cost capacity from a public cloud provider to store archived data. Another example would be where a company uses Salesforce for it's CRM and hosted Exchange for it's email in the public cloud but other company data stored in it's own private cloud.



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(3.4) 'Community clouds' feature infrastructure that is shared by several organizations and supports a specific community. They may be managed by the organizations or a third party and may exist on-premises or off.

A community cloud is a cloud made available to a certain group or association. For example, a consortium of schools or college faculties, might decide to create a community cloud. Payments for use of the cloud might be made via annual subscriptions to the consortium.

(4) What are the benefits of Cloud computing?

Cloud computing has a number of benefits compared to more traditional approaches, including:

- Reduced IT costs
- Enterprise level back-ups
- Better for the environment and green IT
- Reverses the economics of IT from large capital layouts to pay as you go
- Business acceleration with new ideas
- Gives the masses easy access to massive, powerful state of the art infrastructures
- Gives the 'new economy' business models ability to launch quickly e.g. Social media sites
- Scalability of service
- Access to new technology
- Greater opportunities for flexible working practices

(4.1) Reduced IT costs

If a business delivers software solutions or wants to host applications, then they can cut the costs of specifying, purchasing, building and deploying their own infrastructure through the rental from an IaaS provider, such as Amazon. Coupled with this they don't need to build the development stack as this is also available through a PaaS provider.

As businesses shift their applications to internet based solutions, they no longer have to provide infrastructure to sit the application on internally. They also potentially save on the upfront costs by subscribing to a Cloud application and helping manage cash flow.

Businesses can also reduce their on-going costs, as maintenance and other upgrades can be managed 'off site' by the cloud computing service provider.

(4.2) Enterprise level back-ups

Cloud computing enables businesses to have an enterprise level backup solution. The old style tape backup being picked up by the Iron Mountain van doing the rounds will diminish as more businesses turn to online backups as their preferred method on as a backup to a backup. Technology has evolved with internet communications being more robust and guaranteed uptimes, online backup solutions housed in Cloud IaaS providers data warehouses are firmly in the here and now.

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(4.3) Better for the environment and green IT

Businesses, who use Cloud computing will reduce their own energy consumption. Cloud service providers are investing in environmentally friendly data centres, that will provide business with a greener alternative to the more traditional approach to IT like Memset, who are carbon neutral hosting business [Memset IaaS](#).

Businesses, who are leaders in this field choose to allow their users to work from their home offices using hosted VoIP and Cloud access to their servers. This really helps the environment with less travel pollution through the daily commute. Businesses are becoming more switched on to the fact that they can reduce their costs with less office space and allow their users to work from home, which uses technology to benefit the environment, so everyone wins.

(4.4) Reverses the Economics from large capital layouts to pay as you go

If business chooses to invest in an application in the cloud, rather than buying the licenses and hosting it internally, they can simply subscribe to the application, pay on a monthly basis and scale up or down by the users or capacity required on pay as you go basis, essentially like the analogy of the renting a DVD as opposed to buying one.

(4.5) Business acceleration with new ideas

If businesses have new ideas, they can test them quickly and get to market a lot faster with less outlay because their test rig is ready and waiting in the cloud on a rental basis. The Cloud also allows them to scale incredibly quickly by the simple addition of more virtual capacity without a planning and build exercise.

(4.6) Gives the masses easy access to massive, powerful, state of the art infrastructures

Now that the likes of Amazon has already set up these infrastructures, the technology resources available to organizations are now in reach, again without the considerable upfront investment.

(4.7) Gives the 'new economy' business models ability to launch quickly

Without the infrastructures and platforms available, the new economy internet businesses would have struggled to extend themselves and so projects may well have folded without significant outlay. Just a mere look at the staggering social media user populations are a tribute to the Cloud providers ingenuity and designs.

(4.8) Scalability of the services

This is very much akin to a rheostat (distinct memory from my old Physics O'level days!), by simply moving the dial and more service capacity is provided or bringing it down. This is all controlled via the services providers online administration panel for each business but the flexibility is the key and the charge mechanism maps onto it. Cloud providers give businesses the capability increase their service provisions quickly and easily. Take for example Amazon; if you need another Virtual Machine or processor, then it can be set to extend automatically if you so wish.

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(4.9) Access to new technologies

The Cloud providers will always be up to speed with the latest technologies and so will you if you join them. A business will never have to worry about those important upgrades or even should they upgrade. The interesting thing is, take for example Google docs, it's one version and build for SaaS from the ground up. This means better communication and less glitches between companies who use the same SaaS multi-tenanted application.

(4.10) Greater opportunities for flexible working practices

Cloud computing gives businesses the opportunity to be flexible with their workplace. If the applications are connected to through the internet, then the limit is only on the connection but with broadband and 3G being ubiquitous on provision and devices, then employees can sit and work where they would like, if the business so wishes. It in itself breeds a happier and more productive workforce. TechQuarters is a firm advocate of this principle as some of our Helpdesk engineers work from home offices and our hosted VoIP solutions the business and employees flexibility.

(5) How different sized businesses benefit from the Cloud?

(5.1) Small and Medium-Sized Businesses (SME's, 1 to 150 employees)

Many SME's are already using the cloud to leverage off the software applications designed for low cost usage, no setup fees and perfect for the smaller business as they grow quickly without large overheads. Two excellent examples of SaaS are [Xero](#) for accounts software and [Salesforce](#) for contact sales management. Microsoft have launched their attack on Google docs with the new BPOS (business productivity online suite) [BPOS](#), giving customers access to their own Hosted Exchange and Sharepoint for their files and directories to be stored in the cloud.

This all adds up to SME's being able to access most of their key operational software from within the cloud, without having to purchase and build their own infrastructure, which in turns keeps them incredibly nimble and flexible for growth or otherwise. Furthermore, the businesses can purchase these Cloud services under a subscription model, paying only for what they need as their business changes

(5.2) Large-Sized Businesses (150+ employees)

Large business are using public clouds for their development platforms due to the ease of setup and scalable testing with reduced costs plus state of the art platform stacks. The new wave of businesses utilising the public clouds such as social media giants, have seen huge benefits for scalability. These are the type of businesses that are reaping the benefits of the public cloud or the hybrid model.

Large enterprises may use public clouds for extra capacity and for selected services from all 3 models. The businesses generally have too larger networks with legacy systems and security that makes it hard to migrate in full to the cloud, so with the selection of a new application, they either develop for the cloud a fresh or select one from a SaaS vendor for simplicity.

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They also find the need for a higher degree of control over their data, applications, and systems than current public clouds allow, so they choose to run the hybrid model with some services in the public cloud and their own private cloud.

A private cloud will offer them the efficiency and agility of a public cloud without the loss of control. However, the IT services that a pure private cloud can offer are limited to what internal IT can develop or deploy.

(6) Conclusion

Thanks for reading this white paper.

TechQuarters are a Microsoft Online Partner, providing IT Support and project services to SME's and larger Corporates. If you would like to know about these services or merely have a chat about what you have read here, then feel free to email Chris at chris.dunning@techquarters.com or give him a call on +447788 133822.

All the best and have a great day,

Chris.

Managing Director

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