

## THE REAL VALUE OF CLOUD COMPUTING

*Whether your business has got to grips with it yet or not, cloud computing will play a significant role in the future of IT: it has already been enthusiastically embraced by small and medium sized businesses and its potential is also being accepted and exploited by larger enterprises.*

*The purpose of this paper is to explore the view that any business seeking to reap the benefits of cloud environments should not only look at the cost of cloud services but the value they provide.*

**In those dark ages 20 or so years ago, before anyone knew what an Internet was, the business world moved at a pace we would now consider to be slow motion: correspondence was written, posted and delivered, quite likely the next day. And when it really mattered we'd get in the queue for the fax machine, fax speed being about as close to warp speed as we could get. It would take many years for a business to build market share and even longer to break into new territories.**

In the 21st Century, however, the pace of business is somewhat quicker and it continues to increase. The constant stream of new technologies provides more ways to do business and better ways to collaborate: a product or service made available on the Internet can stimulate thousands of enquiries or sales overnight from all over the world, creating a huge spike in the IT workload. Any enterprise burdened with an IT structure that does not permit rapid adaptation to the business environment is at a clear disadvantage.

Peaks and troughs in business are a fact of life: they can be seasonal in nature or created by other events, perhaps by the news, innovation, competitor activity – or even unpredictable economies, for example. Many businesses still tend to cater for the peaks by having too many of their IT assets sitting in an expensive data centre doing very little for most of the time, apart from sucking power to run and cool equipment, taking up space and depreciating in value at a quite alarming rate. Until recently, this has been a price that has had to be paid to ensure that capacity was available.

**Cloud computing will radically change the way organisations purchase, manage and provide computing resources.**

It's not a new concept – there's been no revolution, simply an evolution – it's fundamentally similar to hosting environments that have been around for fifteen years or so. Yes, there's a lot of hype around the idea, but this time the hype is justified simply because the time is right: the technology and expertise is available to provide cost-effective, IT agility and scalability to an extent that was unimaginable just a few years ago.

And just as the technology has arrived in time, the unstable economic environment has helped to make cloud computing an increasingly compelling option to consider, as management cuts costs and seeks to boost productivity by outsourcing parts of IT systems that can be looked after more efficiently elsewhere, rapidly expanded according to need and, significantly, paid for on usage.

If further evidence of the bright future of cloud computing is required, the mighty Microsoft, which gained global dominance with its operating systems and software, expects 90% of its workforce to be working on cloud-related projects within a year, according to chief executive, Steve Ballmer in a Spring 2010 speech. Mr Ballmer also said that he was "betting our company" on a move towards cloud-based software and services.

That's a big bet, but perhaps not too much of a gamble: Gartner has predicted that the cloud-services market will grow from \$70.8 billion in 2010 to \$88.8 billion in 2011, approximately a 25% increase in a year. And both the US and UK governments have endorsed cloud computing in initiatives to modernise and reduce IT costs in the public sector.

---

## What is Cloud Computing?

Discussions on cloud computing usually begin with an attempt to define the concept – but, as that can get a little tedious, let's not go there! Instead, let's explain it in basic terms.

Perhaps the best starting point is to think of 'the cloud' as the Internet. The user simply logs on to their PC and everything they need to get their work done, software and data, is available through their browser. That's it!

Behind the scenes, data and applications are held on an assortment of computing resources somewhere on the Internet or 'in the cloud'. As far as the user is concerned, it's business as usual.

Businesses can build and run their own cloud, with all of the associated costs, or outsource to a specialist provider and pay only for the resources they use in terms of software, bandwidth, storage and so on.

The primary benefits of the cloud to businesses are its agility and elasticity: need more of something (computing power, memory, storage, bandwidth, people on the network, for example)? These are all achievable almost immediately in a cloud environment because of technological developments like Virtualisation.

Both the Internet and Virtualisation (see the brief explanation of Virtualisation below) are central to the concept of cloud computing, and allow applications and data to be provided, according to demand, from a pool of hardware and software resources.

---

## Speed, agility and expertise

Until recently, it made sense to plan an in-house data centre to cope with business growth and increased storage needs – expensive over-capacity which reduces the cost-effectiveness of the whole IT operation. And what happens when they eventually run out of space – build, provision and staff another data centre?

The modular nature of the cloud allows businesses to buy exactly what they need today, rather than speculate with a costly IT solution that they hope the business will grow into at some point in the future.

Cloud computing means that IT can be delivered by specialists as a leased service with predictable costs from bottom to top: the timing and scale of necessary investments in IT, hardware or software, can be aligned usually within hours, to business requirements.

It's entirely possible to roll out new services or provide additional capacity in a matter of hours, rather than days or weeks. Adding extra storage, increasing network bandwidth, memory, computing power, for example, can be achieved, often instantaneously, just by asking for it.

The cloud also presents an opportunity for enterprises to wean themselves off complex and possibly outdated legacy equipment which leech much of the available IT budget – IT professionals spend an inordinate amount of time simply keeping things running rather than adding value to the business.

The significant capital reinvestment needed to replace hardware every three to five years disappears, along with the expense of operating costs, maintenance, software licences, power and so on. Instead, customers can pay for what they use – 'pay as you grow' – and buy results, not assets. IT can be deployed dynamically, to run with the curve of the business, rather than sitting waiting to be used.

Small and medium sized businesses, those with relatively small investments tied up in legacy computing, have been quickest to take up the services offered by, for example, Amazon, Microsoft, Yahoo and Google (although these services have not been without their occasional, well publicised, problems). The cloud provides them with applications, capacity, scalability and agility that they otherwise would not be able to afford – allowing them to focus on their business, not their IT.

### **No wonder it's catching on.**

Little wonder, either, that there is significant growth in the number of companies offering 'cloud services.' And while it is certainly true that many technology hosting businesses are equipped to provide basic cloud services, potential customers need to ascertain precisely what they want the cloud to do for them, plan accordingly and vet potential suppliers. Ruthlessly.

Don't take anything on trust; look for hard evidence that the supplier can deliver precisely what your business needs, when you need it.

---

## **The Components of the Cloud**

The components of cloud computing and how, in the right hands, they are brought together are what makes the cloud such an attractive proposition:

**Infrastructure as a Service (IaaS)** refers to hardware for hire, in terms of servers, storage capacity, and network bandwidth, with the application and the maintenance of that application layer remaining the responsibility of the customer. The servers are virtualised to provide agility and flexibility. IaaS is typically billed on a utility computing basis and amount of resources consumed (and therefore the cost) will typically reflect the level of activity.

**Platform as a Service (PaaS)** allows for the creation and deployment of applications and services and includes the infrastructure to host the built application. It facilitates the quick roll-out and/or modification of operating system features.

**Software as a Service (SaaS)** is a way of providing the same software to different customers via a network, usually the Internet. The software is not hosted on the customers' individual computers and nor is the customer responsible for the hardware that delivers the service. In this instance a supplier takes care of the creation, updating, and maintenance of the software and, again, customers pay for what they use.

---

## **Public Leads the Way**

The cloud comes in many flavours: market growth to-date has been fuelled by the ready acceptance of public clouds. In a public cloud multiple customers share servers, storage and connectivity, as well as the operating environment, and resources are dynamically allocated according to levels of demand. It enables the deployment of an entire IT infrastructure without the capital costs associated with 'owned' systems and offers pay-as-you-go usage and elastic capacity.

In a public cloud, access is usually through standard, and that means shared, Internet connections and all management of the, again, shared environment is in the hands of the service provider. It works, it's cost-effective and if your data isn't mission critical, what's not to like?

It's arguably possible to be up and running on a cloud service quicker than it is to do the cost-benefit analysis – and still save money.

## Virtualisation and Efficiency

Traditionally, data centres have operated on a 'one server one task' basis, which often means that the server is massively under-utilised, running at around 15-20% of its capacity. Virtualisation allows multiple applications to run on the same server which radically improves server utilisation and can result in a significant reduction in the number of servers a business needs.

Virtualisation is not only efficient, it reduces costs in terms of capital outlay, rack space, power and is a 'greener' technology.

## Private

Some enterprises have already embraced the cloud and its benefits, operating their own model – but it still leaves them with the costs associated with running their own IT environment.

There are a few caveats that have delayed acceptance of outsourcing cloud operations amongst larger organisations, with undeniable issues of security, privacy and regulatory requirements topping the list, but that's where private clouds differ significantly from public clouds, particularly the new breed of enterprise quality services that are becoming available.

A **private cloud** offers a closed operating environment with applications and resources dedicated to one customer. With extremely secure Internet connections, data never shares space with data from any other business. In addition to offering the benefits of a public cloud in terms of elasticity, dynamic provisioning, multiplexing and pay-as-you-go billing, private clouds offer a more bespoke solution and can be configured to provide whatever components of security, control and auditing are required.

In short, quality of service and the value it delivers is everything in a private cloud – and this means much more than the cost-per-hour value. It's about providing agility and scalability, but with added security, efficiency, resilience and accountability.

**And that brings us back to the suppliers of Infrastructure as a Service – they are not all created equal in terms of their facilities, capabilities and experience.** Enterprise-class providers are specialists and can afford to use the best of the best when it comes to data centres, infrastructures and networks. Look for a supplier with a strong balance sheet, a track record of innovation and success and a demonstrable long-term commitment to the market.

**Then examine how the company will guarantee the confidentiality, integrity and availability of your data.** Reassure yourself that extensive, efficient and sophisticated measures and controls can be built in as you require. Only then should the price, or value, of a service be considered.

Successful managed service providers that already have in-depth experience operating corporate networks can add value to the relationship in numerous ways:

- Compliance, governance and jurisdiction – they will be aware of current and emerging standards and legislation
- They should be able to migrate data to and from the cloud and integrate with 'home' data centres efficiently
- Service Level Agreements (SLAs) should be as adaptable as the services they provision
- They should certainly provide robust business continuity and disaster recovery measures from the beginning
- Storage is a growing issue – the cloud provides a very efficient environment for the safe storage of data and the responsibility to provision additional capacity lies with the service provider
- The provider should understand that every enterprise will have its own priorities offer a comprehensive 'menu' of services that can be adapted according to its customer's needs.

---

## Food for thought on costs

It might be useful at this stage to take a brief look at the costs of running a private cloud in an 'in-house' data centre and compare it to the costs associated with Infrastructure as a Service (IaaS) and Managed Services models. In the example it is assumed that the IaaS and Managed Services provider offers data centre facilities and support that is at least the equal of the in-house solution.

**Let's assume the business is a medium-sized enterprise with around 24 physical servers running a mixture of common applications.**

### In-house

Running and maintaining an enterprise-class data centre is an expensive business, beginning with the building and maintenance of the facility itself. Typical costs to be taken into account include:

### People

The specialists required to run the data centre and look after the environment around the clock, every day of the year, are inevitably one of the main costs to consider.

- Network operations centre
- System administrators
- Storage engineers
- Communications engineers
- Security engineers
- Mechanical and electrical engineers needed simply to keep the data centre running
- Physical security (guards)
- Training and education – necessary to support systems, storage, networks and security infrastructure.

### Data centre and infrastructure costs

A complete range of costs are associated with the data centre and its infrastructure, and while this example is by no means exhaustive, it covers most of the basics.

- Rent and rates
- Electricity for power and cooling
- Building maintenance
- Infrastructure support, for example uninterrupted power supply (UPS) and generators, air conditioning (chillers, down flow units, etc), Data Centre power (transformers, power distribution units, etc)
- Servers and ports, including racks, cabling and power setup
- Platforms
- Storage
- Network equipment
- Monitoring
- Backup and archive provisioning
- Business continuity and disaster recovery measures
- Software licensing
- Security (including encryption) and firewalls
- Office space for support staff.

### Capital, term and money costs

Financing the investment in the first instance – the cost of money – is a significant factor in the equation. Normally when an IT department purchases (leases) IT equipment they look to realise the assets across three or five years. Often the funds to make these investments are borrowed – and paid back over the same three to five year term so that the cost of the equipment can be calculated for that time.

**For the purpose of this example we'll assume that the three year cost to deliver the solution is 100%**

---

### Managed Hosting Service

With a managed hosting solution, the customer would need to equip the data centre, with the management services provider supplying complete infrastructure management. The primary costs would include:

- Servers
- Storage
- Network Equipment
- Racks, Cabling Power Setup
- Special Features (security, etc)
- Fees.

With significant capital and operating costs, associated with running an in-house facility, stripped from the equation, plus efficiencies gained through virtualisation, **the savings realised in a Managed Service model is likely to be around 23% when compared to an in-house solution.**

---

### Infrastructure as a Service (IaaS)

In the IaaS model, customers are simply paying for an IT infrastructure as a service – buying their usage per unit, as agreed. Similar to the Managed Services example above, the customer benefits from the service provider taking complete responsibility for the entire IT infrastructure. In this instance the sole annual cost to consider is:

- Service charge.

**The same environment running on an IaaS model is likely to be up to 55% cheaper than that of the in-house solution.**

---

### SunGard's Infrastructure as a Service

SunGard Availability Services is one of the most respected players in the business continuity and managed IT services market and has established an envied reputation for providing world class enterprises with Information Availability and business continuity solutions.

In October 2009 the company launched SunGard's Infrastructure as a Service, one of the first private cloud products delivering enterprise-class cloud infrastructures. It provides a unique combination of accommodation, environmental controls, systems and networks to ensure unsurpassed levels of availability, scalability, resilience and quality of service.

Uniquely, SunGard controls and manages the end-to-end service: data centre, network infrastructure and storage management and has built its private cloud service to mission-critical standards that only SunGard has the proven expertise to deliver.

The cloud infrastructure must be built and delivered with availability at its core. Therefore to be effective the cloud needs multiple highly resilient data centres with the best network links between them.

SunGard has invested in resilient, highly secure networks and data centres that are the envy of IT leaders in world class organisations. While most cloud computing providers leave it to the customer to provision and manage their cloud services, SunGard provides both start-up and ongoing help and support, with all cloud offerings being managed services.

## Conclusion

Businesses are under continuing pressure to reduce costs and produce more, yet enterprise data centres are, more often than not, populated by a broad yet inflexible range of servers and operating systems, based on different types of processors acquired at different times and for different purposes in the company's history. Modifying or upgrading such complex environments is a slow, labour intensive process requiring significant capital outlay.

The theory of secure cloud computing has been around for some time and the range of benefits it can provide have long been a sought after ideal:

- Reduces costs, allowing capital expenditure to be converted into more manageable operating expenses on a 'pay as you grow' model
- It is highly automated and therefore more efficient to manage
- It offers unmatched flexibility and agility to a businesses function
- The cloud provides increased storage options
- It permits IT to focus on revenue generating projects rather than performing endless maintenance on legacy systems.

**Cloud computing has a profitable role to play in almost any business.** Until now many enterprises have been reluctant to adopt the model due to concerns about the security and availability of their data. These barriers to acceptance are no longer valid arguments: there are different types of cloud and there are different competencies amongst vendors.

**Enterprises can now be sure that the right cloud from the right vendor will satisfy the most stringent regulatory and compliance standards and provide levels of availability and security that, at the very least, match their own.**

**If your business is not already seeking to reduce IT costs or looking to increase the agility of its IT environment with a cloud solution, there is only one question to ask: WHY NOT?**