WHITE PAPER

Cloud computing: Marketing hype or sound business strategy?

verizon business

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Building a house is difficult and costly. That's why a family with two children would most likely not request a house with eight bedrooms "just in case." And rarely are homes built with three dining rooms and an extra kitchen just to handle the annual holiday get-together. These spaces would sit underutilized for most of the year, and the time and costs associated with them would not fit most budgets.

Building an enterprise infrastructure can be equally challenging and costly. Yet most business infrastructures are intentionally overbuilt, as IT routinely deploys extra server capacity that sits unused for 10 months out of the year. Why the precaution? Because most companies have been burned at one time or another by the crashed websites and unavailable applications that result from unplanned usage spikes. From a service perspective, this overbuilding makes sense. From a business perspective, it's crazy.

What if there were a better way? What if you could build an infrastructure for your critical-business applications and data with the flexibility to add and subtract capacity as needed? What if you could create a foundation that adapts to your business without breaking your budget? Cloud computing offers the potential to solve these challenges.

Solid but still taking shape

The concept of cloud computing has been touted for some time now as the "next big thing" in information technology (IT). The ability to provide flexibility and control costs through a modular service model built upon a common hosted platform is attractive to many technology decision makers. Many analysts and publications agree that the potential of cloud computing is real and ready. However, there are practical considerations that need to be addressed whenever enterprises look at outsourcing IT.

In a recent CIO.com survey of IT leaders, 58 percent of those surveyed believe that cloud computing will trigger a profound shift in information technology. Yet 36 percent believe that current offerings are not yet appropriate for their business. Security heads the list of concerns, with six out of 10 respondents stating that vendors have not adequately addressed security around cloud offerings. Other top concerns include availability and control of data.[1]

This paper explores the business benefits of cloud computing and addresses the three primary concerns of security, availability, and control. The variety of cloud computing solutions in the marketplace today present different levels of service that can fit a wide range of computing requirements. Understanding the elements of each service offering, and how it can serve your operations, is critical to making an informed decision.

1 "Cloud Computing Survey," *CIO Magazine*, August 2008.

Exactly what is cloud computing?

As with any emerging technology, a universal definition of cloud computing has yet to be agreed on, leaving many to sort through the variety of confusing concepts and terminology currently used to describe cloud computing. But establishing an accepted definition is important. Creating a common starting point and basis is necessary for meaningful discussion and assessment.

To help clarify things, Gartner recently defined cloud computing as "a style of computing in which massively scalable IT-enabled capabilities are delivered 'as a service' to multiple customers using Internet technologies." This definition seems appropriate because it positions cloud computing as a business enabler rather than a technical construct—a function that IT leaders are finding increasingly necessary as the role of IT evolves.

The IT capabilities offered through cloud computing can be grouped into three general categories:

Developer tools (Platform as a Service, or PaaS)

- Description: This model delivers a computing platform that gives users the resources they need to develop and deploy web-based applications without purchasing, installing, and managing the supporting hardware and software systems.
- Enterprise potential: Growing. PaaS was originally targeted at independent developers who didn't have the resources to build and manage their own data centers. Enterprise developers are finding these tools to be useful up to the point of deployment, when they may need to move the application to a more enterprise-oriented hosting environment.

Business applications (Software as a Service, or SaaS)

- Description: This model makes it possible for organizations to license applications as a service on demand, thus avoiding the need to purchase and maintain software installations across their business. SaaS is customarily offered via a subscription model with fees based on usage. SaaS providers usually offer both the software and support, and often partner with third-party hosting providers that help operate and support their SaaS systems.
- Enterprise potential: Established. This is the most mature cloud-based service model. SaaS is targeted at enterprises looking to gain efficiencies by standardizing certain functions (customer relationship management [CRM], payroll, other accounting functions) on a common software platform that can be delivered through the cloud. SaaS is a good option for enterprise applications that don't require a great deal of customization

Infrastructure resources (Infrastructure as a Service, or IaaS)

- Description: In this model, the cloud is a form of utility infrastructure. The primary attraction is that an enterprise can get all the computing capacity it needs for vital business applications without having to design, acquire, build, and manage an underlying infrastructure.
- Enterprise potential: Growing. As the demand for computing increases, larger amounts of processing power and data storage are required to support important enterprise applications. Organizations are realizing that an innovative model of computing will be necessary to manage this vast information infrastructure. IaaS offers increasingly widespread appeal because it creates a shared pool of resources that can be allocated on demand to any application as needed by the enterprise. This approach also supports a pay-per-use or measured usage billing model, more closely matching your cost to what your business requires.

The business case for cloud computing

The promise of cloud computing is real. It has the potential to reshape the role that IT plays within an organization to the same extent that the Internet has changed communications and commerce.

Efficiency and cost control.

Companies depend on being able to provide consistent, reliable access to internal applications, external websites, and customer portals. In a traditional computing environment, this creates the need to build and maintain redundant systems, which can be expensive and difficult to manage. In cloud computing, this function is moved to the cloud, where service providers can leverage economies of scale to provide a highly reliable platform with greater cost and management efficiency.

For many organizations, the most appealing feature of cloud computing is the flexible capacity it offers. Access to large amounts of scalable computing power gives organizations the freedom to adjust capacity up and down with the natural cycles of business. Resources can be added, turned off, or reassigned whenever necessary. The cloud eliminates the need for "over-provisioning" and the unnecessary hardware, software, maintenance, and electricity costs it incurs.

Better business support.

The advantages of cloud computing are especially clear when looked at from a business perspective. By reducing the time and effort required to launch new applications, cloud computing helps IT become more responsive to the pace and dynamic nature of business.

For IT, deploying a new business application is a major undertaking. Without sufficient time to assemble the necessary resources (human and financial), IT becomes a bottleneck to projects that could benefit the business. Applications supported by the cloud don't require the deployment of a large infrastructure at the customer's location, which dramatically reduces the upfront commitment of resources. New applications can be approved and deployed more quickly, making it easier to satisfy the needs of business managers throughout the organization.

Better financial management.

With cloud computing, the financials are dramatically altered. Cloud computing eliminates the need for large capital outlays to launch new applications, moving the decision out of the investment realm and into the operational.

Overview of cloud computing services

Service	Definition	Audience
Developer tools Platform as a Service	Platform that enables the development and/or deployment of applications without the costs of purchasing, installing, and managing the supporting hardware and software systems.	Independent developers who don't have the resources to build and manage their own data centers; enterprise developers working on web applications.
Business applications Software as a Service	Software is deployed as a hosted service delivered over the Internet, typically using a subscription model with fees based on usage.	Enterprises looking to gain efficiencies by standardizing certain functions like CRM, payroll, etc., on a common software platform that can be provided as needed.
Infrastructure resources Infrastructure as a Service	Infrastructure is delivered as a utility over the Internet, creating a shared pool of resources that can be allocated to any application as needed by the enterprise.	Companies of all sizes that don't want to be in the business of managing hardware.

Transitioning from a capital expense model to an operational expense model reduces financial risk to monthly increments and provides a higher degree of flexibility to manage expenses over time. If the market slows, organizations aren't locked into expenses their budgets can no longer support. If applications produce disappointing results, an enterprise can walk away or pursue a different direction without having to abandon an expensive on-premises infrastructure.

Stronger IT focus.

Cloud computing creates an opportunity for IT departments to change their focus from deploying and supporting applications to managing the services that those applications provide. By transferring the responsibility for monitoring and maintenance activities to a third party, the IT department can focus more on high-value activities that align with and support the business goals of the enterprise.

Instead of being primarily reactive and operations-focused, the chief information officer (CIO) can function more as a technology strategist, working with business units to understand their business needs and advising them on how best to use technology to accomplish their objectives.

What to expect: Associated risks and challenges

The benefits of cloud computing are compelling, and many organizations are planning or have already begun implementations. Still, some business and IT leaders are hesitant. This is understandable, as there are a number of practical issues that need to be addressed when moving IT functionality into the cloud.

Security is the biggest concern.

In cloud computing, server, network, and storage are provided to the enterprise as a service. In turn, data is delivered to the cloud. Whether it's private customer information, business data, intellectual property, trade secrets, or legal documents, IT leaders are understandably sensitive about letting this kind of information outside the company firewall.

Where will data be stored? Does the service provider maintain its own secure physical infrastructure, or will processing and storage functions be farmed out to third parties? How will data be secured as it travels within the cloud itself? These are critical concerns that must be adequately addressed before IT leaders can consider expanding their use of cloud computing solutions.

Industry standards and regulations such as HIPAA, the Payment Card Industry Data Security Standard (PCI-DSS), the Gramm-Leach-Biley Act (GLBA), and the Statement on Auditing Standards 70 (SAS-70) have very defined and measurable security requirements. Organizations must be prepared to clearly identify how data will be handled and stored, an undertaking that could prove difficult when data exists in the cloud. If data isn't handled properly and regulations are violated, who is responsible? For cloud computing to be viable for the enterprise, providers must adhere to the same standards and controls that an organization would impose in house.

Availability and reliability must meet enterprise expectations.

IT systems that support key enterprise applications need to be stable, reliable, and highly available. Theoretically, on-demand computing should offer a high degree of reliability since the cloud distributes compute, network, and storage functions across a substantially larger pool of physical and virtual resources, making it more tolerant of individual hardware failures.

But what happens if service goes down and workers sit idle because they can't access the software they need? Obviously, providers need to meet or exceed enterprise service level requirements (SLAs). But it's also important to have realistic expectations. Failures and outages are inevitable with any technology, and are known to happen even in today's highly robust, enterprise-run data centers. Providers should back their service with stringent SLAs for availability as well as define liability for unplanned outages.

Control of environments in the cloud is a concern.

By their very nature, cloud computing service models involve transferring some control to a trusted service provider. If certain areas of functionality are deemed so essential that they must remain in-house under the direct control of IT, then other considerations may have to take a back seat. In these instances, the best approach may be to run a test program that allows IT to become comfortable with varying levels of control within the cloud computing model.

At the least, a service provider should offer a high level of real-time visibility into the systems that reside in the cloud. This should include accurate and meaningful reporting on availability, performance data, service requests, how well the service provider is meeting SLA requirements, and other key metrics. Ideally, a service provider should also offer the option of self-service provisioning via a customer management portal, which allows hands-on control of systems in the cloud.

Also, the level of customization and configurability offered by a service provider is important. It should not be assumed that the capabilities or limitations of one provider will be common for all others. As cloud computing becomes more available, the type and level of customization offered by a service provider will become a competitive differentiator.

In the end, concerns about control might be better assessed in terms of what is actually necessary to support the business. Is onsite control over physical hardware going to move the business forward, or is it more important to control how those budget resources might be reallocated to support vital business objectives?

Security, availability, and performance are the top enterprise concerns.

Careful planning and vendor selection are the keys to success

Like most new technology efforts, the challenges associated with cloud computing can be managed through judicious selection of projects and vendors. Below is a list of recommendations that help define how the planning and vendor selection process should take shape.

Be sensitive to your organization's philosophy on risk vs. reward.

Because smaller companies are the most resource constrained, they're likely to make the boldest moves into cloud computing, outsourcing as much as they can as quickly as they can. However, for most enterprises, it's not practical to think about moving an entire data center into the cloud—at least not right away.

If your organization is concerned about risk, you may want to start with small, finite term projects with less data sensitivity. Possible trial runs might include one-time HR events such as employee surveys or staging and development environments that aren't critical to the business.

If you're looking for more tangible business results, evaluate your current application environment and look for systems and applications that require highly scalable computing capacity. These might include online retail sales that have predictable spikes during high-demand shopping seasons. Your organization will gain the most from migrating these to a secure, reliable cloud computing platform.

When it comes to security, choose wisely.

At a minimum, potential cloud service providers must be able to support enterprise-class applications and show where data resides, how it is protected, and how access is managed.

When assessing options, look for service providers with a track record of proven security capabilities. Security should be offered in a layered approach that covers the infrastructure and client environments.

Individual organizations will continue to be responsible for meeting regulatory and industry compliance requirements. Yet with cloud computing, the burden for maintaining security systems in the cloud will fall on the service provider.

For this reason, it's important to select providers that have security expertise in PCI DSS, HIPAA, GLBA, and other security initiatives.

The more detail a potential vendor can provide in the areas of security, the more confident you can feel that they have the expertise necessary to support enterprise applications.

All providers are not created equal.

A management portal that allows customers to view and manage resources is essential. But while most providers have such a portal, they can differ widely in features, function, and response time. Make sure the quality of the customer service portal is factored into your criterion for provider selection.

Based on your project, you may also have specific technical requirements that could affect system design or budget decisions. For example, virtual server and storage resources in the cloud generally provide the best value, but physical servers may be preferred for critical applications and high I/O processes such as database or email applications. And while many customers will be able to take advantage of the economies of scale offered by shared infrastructure resources, some businesses have individual requirements that will necessitate physical resources. In these instances, service providers should be able to offer dedicated systems that meet these distinct needs.

Longevity and stability are also critical factors since a service provider's business viability is critical to receiving dependable, continuous service. Unfortunately, with low-cost offerings such as cloud computing, the barrier to entry is also low, which means any shop can hang a sign on its door and claim to be a cloud computing vendor.

Who benefits the most from early adoption?

Business need	Who benefits
Highly scalable computing capacity Ability to quickly turn capacity up and down as demand increases or decreases throughout the year.	• Retailers with holiday shopping hours • Manufacturers with seasonal demand • Educators with online application, enrollment, and payment programs • Departments with significant end-of-month/quarter/year activity • Businesses running weekly and monthly marketing promotions • Businesses growing through acquisition and integration
Temporary computing capacity Access to capacity for short periods of time without requiring capital expense.	• Businesses that run sporadic marketing campaigns/promotions • IT departments with occasional development projects

Cloud computing is a sound business strategy.

The silver lining for cloud computing

Before choosing a service provider, consider how long the company has been in business, review available financials to assess health and viability, and carefully examine their record of service offerings.

Cloud computing promises to be the driving force behind the next wave of technology innovation. But it's more than that; it's also a sound business strategy that helps organizations practice better financial management and creates a more sustainable, cost-efficient model for supporting IT services.

While valid concerns exist, they can be managed with proper preparation. Detailed planning can help determine when and how you should move your IT infrastructure to the cloud. Careful evaluation of vendors can help you select a service provider whose solution is enterprise ready in key areas such as security, availability, and control.

How can Verizon Business help you get started?

Verizon Business is a global IT, security, and communications solutions partner to business and government, with the world's most connected IP network.* We are also a leader in managed solutions, and many of the world's largest organizations rely on us for a variety of IT services, from basic colocation to full management of their networks, infrastructure, and critical business applications.

Our Computing as a Service (CaaS) model addresses many of the issues that have been holding enterprise organizations back from fully exploiting the potential of cloud computing as a viable IT solution. Security,

Why Verizon Business?

- IT experience. We bring more than 15 years of IT outsourcing experience including hosted and managed network, infrastructure, and application services.
- Network. Our global, IP-based network is one of the largest wholly owned, facilities-based networks in the world—supporting tens of thousands of businesses and government agencies around the globe, including 98 percent of the Fortune 500.
- Competitive service level agreements. Our service is backed by competitive SLAs, including 100 percent availability of the customer management portal. Those choosing to rely on Verizon Business to manage their servers receive additional SLAs such as 100 percent server availability and specific response and resolution time frames.
- Leading security practice. CaaS was designed and is delivered with security in mind. We also offer optional Professional Security Services that include identity and access management, host intrusion detection and prevention, log management, application vulnerability assessments, and network application assessment, as well as the Security Management Program.
- Professional IT services to help you assess which applications are right for virtualization, migrate your applications to the virtual environment of CaaS, and leverage your infrastructure investments.
- Application management services. Regardless of your hosting needs, we can monitor, manage, and help improve your business-critical applications and infrastructure.

* Based on 2008 TeleGeography Global Internet Geography Study of Autonomous System connections.

To learn more about our CaaS offering, contact a Verizon Business account manager.

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