

Clearing the Clouds for Midmarket Businesses

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In today's always-on, hyper-connected world, technology has become a critical ingredient for business success. Businesses of all sizes view technology as essential to improving customer engagement, raising employee productivity, and creating innovation and differentiation—all vital components for building economic value. But in the midmarket, where limited IT resources and budgets are the norm, keeping pace with the technology that your business requires can be an uphill battle.

Cloud computing promises to help midmarket companies reduce cost and complexity in the IT equation—and gain the flexibility and agility they need to thrive. Yet charting a clear course to the cloud isn't always easy. After all, you need to cut through the marketing hype that surrounds the cloud, and then understand and parse the advantages and disadvantages of different types of cloud computing models. In addition, you need to determine which cloud alternatives are best suited to your company's strategy; workload, performance and security needs; in-house IT expertise; and desire to “do it yourself”—both now and in the future.

In this paper, we aim to clear the clouds. We examine different cloud computing models, discuss the types of requirements that each can best address, and consider what midmarket businesses should look for in a cloud solutions provider.

SECTION 1: WHAT IS CLOUD COMPUTING?

Cloud computing provides you with access to software as well as server, storage and other computing resources that you provision over the Internet or a private network. These resources are location independent in that the user typically doesn't need to manage or even know where the resources physically reside. Users acquire and use IT resources as needed, and pay for the services they use based on consumption.

Cloud computing is built on virtualization technologies that provide the capability to provision IT services from an elastic pool of resources. Virtualization enables the partitioning of one physical machine into several virtual machines—each of which can interact independently with other devices, applications, data and users as though it were a separate physical resource.

Different virtual machines can run different operating systems and multiple applications while sharing the resources of a single physical computer. Because each virtual machine is isolated from other virtualized machines, if one crashes, it doesn't affect the others. In addition to using virtualization technology to partition one machine into several virtual machines, you can also use virtualization to combine multiple physical resources into a single virtual resource. Storage virtualization is a prime example, where multiple network storage resources are pooled into what appears as a single storage device for easier and more efficient utilization and management of storage resources.

Hypervisor software makes virtualization possible. This software, also known as a virtualization manager, sits between the hardware and the operating system, and decouples the operating system and applications from the hardware. The hypervisor assigns the amount of access that the operating systems and applications need to the processor and other hardware resources, such as memory and storage systems. Cloud providers manage and optimize resources with metering capabilities relevant to the type of service (storage, compute, bandwidth, active user accounts, etc.) that they provide.

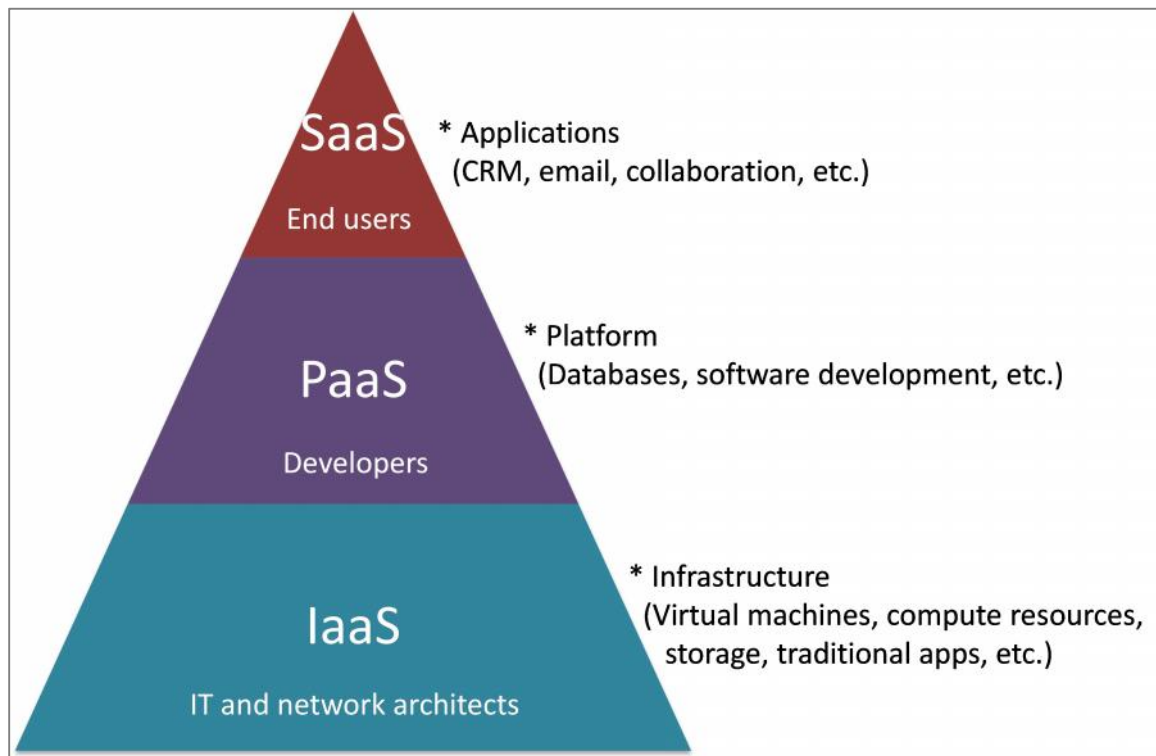
SECTION 2: CLOUD COMPUTING SERVICES AND ENVIRONMENTS

Businesses can select from and use a growing number of cloud-based IT services and deploy them in different types of environments.

The following are the three most common types of “IT as a service” offerings, which are illustrated in **Figure 1**:

- **Software as a Service (SaaS)** provides users access to software applications over the Internet. Instead of having to buy, install, update and manage these resources on your own computer or device, you access and use them through a web browser. The SaaS provider manages the software, processing power and storage for you, in the cloud. Most SaaS solutions run in the public cloud (described below) and are offered as subscription-based or free services. Examples of popular SaaS applications include on-demand business applications, such as Salesforce.com, Google Apps for Business and SAP SuccessFactors, and free social networking solutions, such as LinkedIn and Twitter.
- **Platform as a Service (PaaS)** provides the infrastructure and computing resources necessary to develop, test, run and manage SaaS applications in an integrated cloud environment. Anyone with an Internet connection can tap in and develop cloud-based solutions without having to source, buy and manage hardware, operating systems, databases, middleware and other software. Most PaaS vendors provide tools such as JavaScript, Adobe Flex and Flash that are easier to use than traditional programming tools. Users don't own or control the development environment, but they do control the applications they develop and deploy on it. Some of the better known PaaS providers include Google App Engine, Windows Azure and Salesforce's Force.com.
- **Infrastructure as a Service (IaaS)** provides hosted IT infrastructure for users to provision processing, storage, networks and other fundamental computing resources. The IaaS provider runs and manages this infrastructure, and you can run the operating systems and application software of your choice on top of it. Amazon Elastic Compute Cloud (EC2), Verizon Terremark and Google Compute Engine are examples of IaaS providers.

Figure 1: Cloud Computing IT Services Offerings



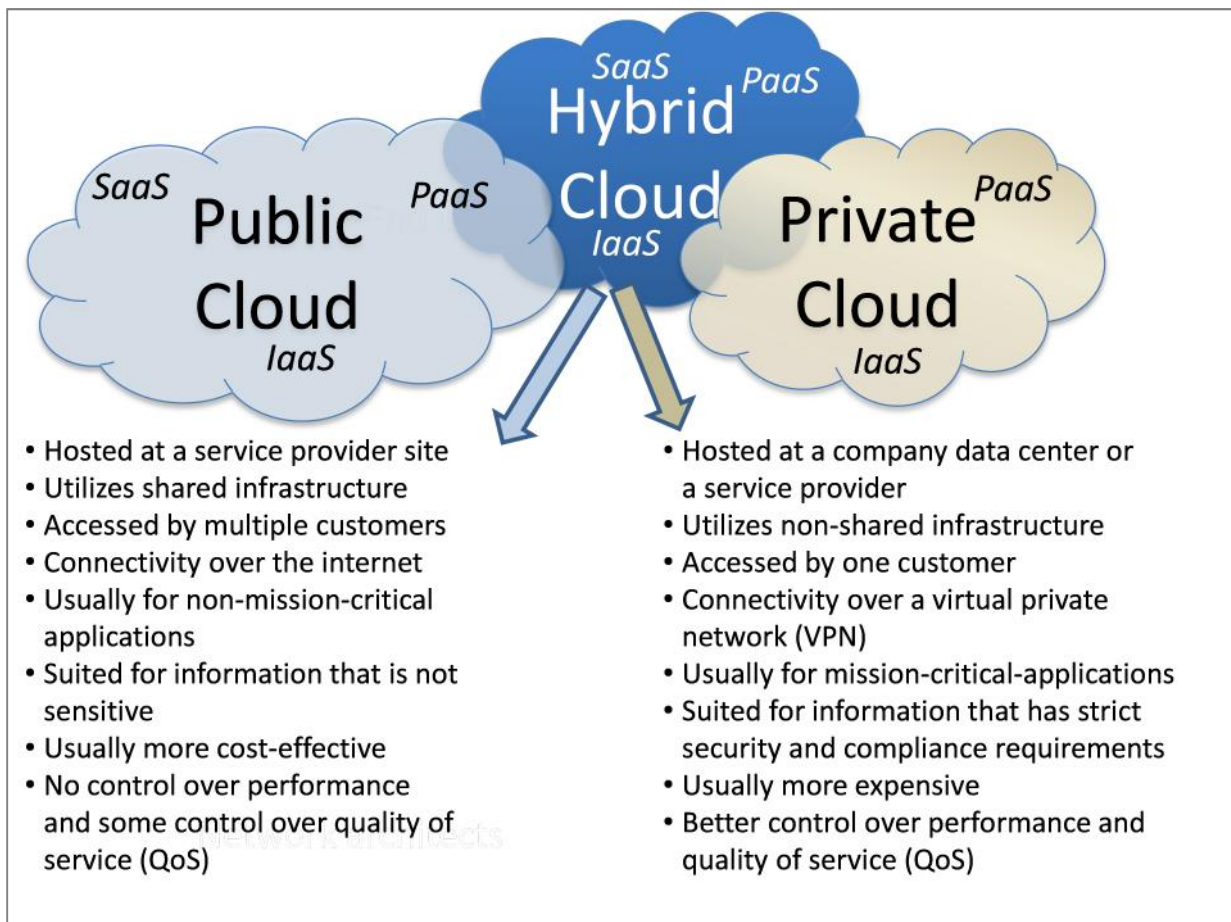
Source: SMB Group, 2012

These cloud services can be provided in the following types of environments, which are depicted in **Figure 2**:

- **Public clouds** are probably the most widely known and used cloud environments today. Public clouds are built, managed and maintained by a third-party cloud provider, and servers, storage, network infrastructure and applications are shared among subscribers. As the name implies, they are available and can be used by anyone who wants to buy services on them, typically via a subscription pricing model. Free public cloud offerings, usually supported by ad revenue, are also available. Public clouds are typically self-service, meaning that users provision the resources they want to use.
- **Private clouds** are dedicated to one organization's sole use; all resources on the infrastructure belong to one specific enterprise. Private cloud infrastructure may be physically located inside the organization's firewall or at a third-party hosting vendor's site. You can manage your own private cloud, or you can have a third-party service provider manage it for you. Either way, commercially available infrastructure hardware, hypervisors and management software are usually used to build and manage private clouds.

- **Hybrid clouds** consist of both public and private cloud resources that are owned and managed by both the internal IT staff and third-party providers. Some components of the IT infrastructure reside in a public cloud, and the remainder reside on the organization's premises. For instance, depending on requirements, you may keep your data at your site in a private cloud, but do analytics processing in the public cloud—or vice versa.

Figure 2: Cloud Computing Environments



Source: SMB Group, 2012

SECTION 3: WHY SHOULD MIDMARKET COMPANIES CONSIDER CLOUD COMPUTING?

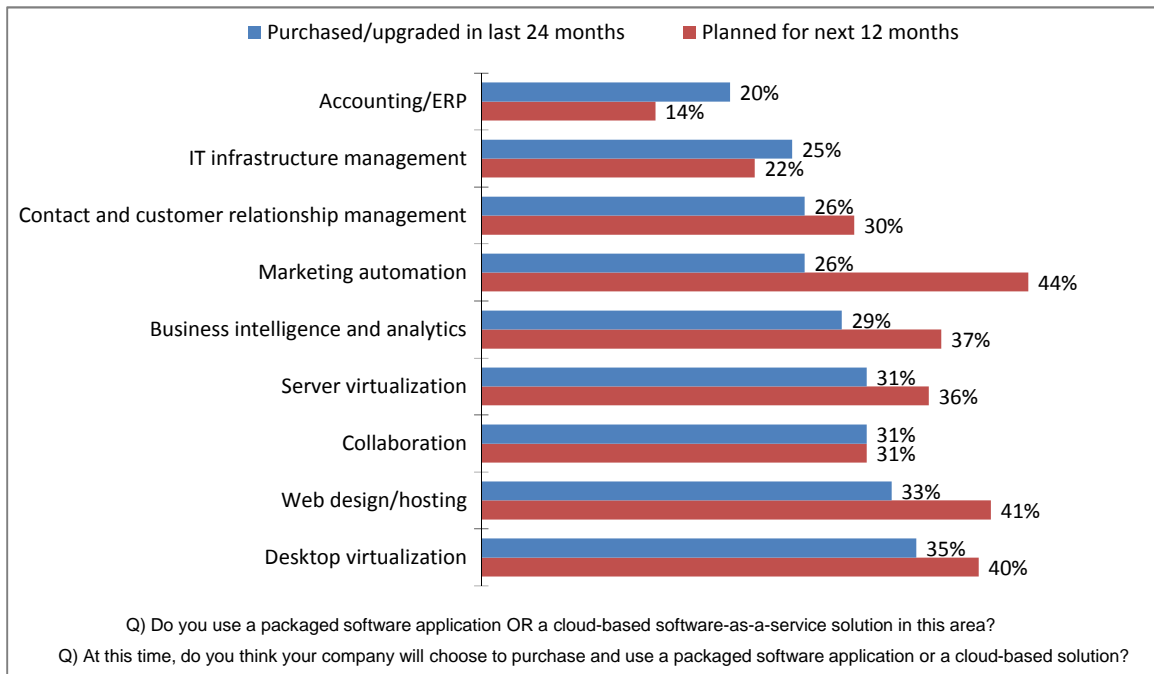
Cloud computing offers speed to solution, agility and flexibility benefits that are shifting business expectations and behavior in favor of cloud solutions. Midmarket companies, which often wrestle with limited IT budgets and resources, are increasingly drawn to the benefits of cloud computing. It can provide several advantages over traditional computing models:

- **Improved business agility.** Cloud computing makes it faster and easier to provision and reallocate IT infrastructure resources. Companies can quickly provision new applications or infrastructure as required, or scale the use of these resources up or down as business conditions dictate. By using a PaaS development platform integrated with IaaS, developers can apply reusable tools and templates to accelerate and simplify development and testing processes. Finally, cloud computing users also reap the benefits of anytime, anywhere, any device access to applications and data.
- **Higher efficiency.** Some workloads, such as e-commerce, require several times more processing power during peak times than during slower times. Traditional IT infrastructure is designed to cater to peak use periods, meaning that most of the hardware capacity will be idle most of the time. For instance, the average server utilization rate is estimated at 5% to 15% of the total capacity. In contrast, cloud infrastructure allocates capacity as needed. In public cloud environments, users pay only for the capacity that they use, when they use it. In a private cloud, more efficient use of hardware resources can dramatically improve utilization and reduce hardware and associated management, energy and data center costs.
- **More predictable and manageable costs.** Cloud computing gives companies the ability to meter use of expensive resources such as IT infrastructure and business applications based on usage as well as actual resource and capacity requirements. Businesses purchase cloud computing resources in a utility-like model, as required. Instead of sinking money into large upfront capital expenditures for resources that may never be fully utilized, businesses “pay as they go” for public cloud computing as an operational expense. Meanwhile, private cloud scenarios provide better cost control by enabling more efficient allocation of both physical IT infrastructure and human IT resources across the organization.
- **Increased reliability. Cloud and virtualization platforms provide** capabilities for live migration, storage migration, fault tolerance, high availability and distributed resource scheduling. These features can help improve uptime and enable quicker recovery from unplanned outages.
- **Improved disaster recovery.** By consolidating the number of physical servers in production, cloud computing makes creating a replication site more affordable. Because you don't need to have identical hardware at the replication site, you can put less expensive hardware there. Finally, many cloud platforms and virtualization solutions include software to help automate failover if disaster does strike.

- Optimized quality and consistency.** Cloud computing environments can help reduce errors and bugs throughout both development and deployment processes. Virtualization enables IT to set up a test environment without new hardware, and to create pre-tested, standardized configurations that ensure consistency and reduce unwanted surprises. And when a problem occurs in the public cloud, providers can apply the remedy once across all instances for faster and more proactive problem resolution.

Due to these advantages, demand for cloud-based solutions is accelerating (**Figure 3**). Applications such as desktop and server virtualization, web design/hosting, collaboration and business analytics are already seeing rapid migration to the cloud, and plans across all areas are on the rise.

Figure 3: Midmarket Businesses Are Moving to the Cloud



Source: 2011 Small and Medium Business Routes to Market Study, SMB Group

SECTION 4: PUBLIC CLOUD CONCERNS FUEL PRIVATE AND HYBRID CLOUD INTEREST

Interestingly, some of the same things that cloud proponents cite as benefits are seen as obstacles by cloud skeptics. These obstacles have stopped some companies from moving mission-critical applications and/or highly sensitive data to the cloud, and are fueling increasing interest in private and hybrid clouds:

- **Security risks** are the top concern when using public cloud environments. Because computing resources are shared, data is arguably more susceptible to hacking and theft, and unauthorized users can more readily intrude on applications. Security concerns surrounding the public cloud have been the top driver for considering private cloud options for mission-critical applications and data.
- **Spotty performance** in a shared environment is another common fear related to using the public cloud. After all, if your business is competing for resources, and the public cloud provider doesn't have sufficient infrastructure, performance can slow down. However, contractual service level agreements (SLAs) can help alleviate this concern.
- **Loss of control** holds some businesses back. Internal IT shops are accustomed to managing everything and may be leery of handing over the reins to a service provider—either because of genuine concerns about its capabilities, or because of fears about job security.

In reality, most large public cloud providers have almost limitless capacity—and certainly more than the average midmarket business can muster. They are putting more security safeguards in place, and providing better access to real-time information and processes for customers who want more visibility and control.

But the bottom line is that every business must assess its own requirements and evaluate which option will do the best job of providing the capabilities, value and peace of mind that it needs.

SECTION 5: HOW TO SELECT CLOUD SOLUTION ENVIRONMENTS

Midmarket companies have many options when it comes to choosing which type of *cloud environment*—public, private or hybrid—to deploy. As with any other solution space, the most important step you can take is to ensure that the solution you choose meets your company's requirements—both now and in the future.

Some workloads, business requirements and resource constraints tend to favor the public cloud, while others favor a private cloud or hybrid approach. Although there are no hard-and-fast rules, key considerations when evaluating which cloud environment makes the most sense for your business include:

- **New solution versus an upgrade to an existing solution.** The process of sourcing, buying and deploying all required resources that the business may need for a new

solution—say, for social sentiment analysis or corporate performance management—is resource-, expertise- and time-intensive. If any of these are in scarce supply, the public cloud option is likely to be your first choice. On the flip side, if you're upgrading your company's financials, these resources and capabilities are probably less of an issue, and moving the upgrade to a more efficient private cloud may be the best course.

- **Business significance of the solution.** When a workload is mission-critical and differentiated, businesses may choose a private or hybrid cloud model so that they can exert greater control over solution customization, configuration, upgrades, management and other areas. For instance, your business may gain a distinct competitive edge from a highly customized logistics or procurement system. In contrast, although email is business-critical, it is rarely used or viewed as a means to differentiate for competitive advantage; so using a public cloud may be a very viable option.
- **Time-to-solution requirement.** If you need to get a new solution in place on a tight deadline, public cloud solutions have a clear advantage because you can tap into the resources you need in minutes.
- **Data sensitivity.** Businesses that need to secure highly confidential or sensitive data may prefer the added safeguards that they can put in place in a private cloud. Depending on the circumstance, you may want to take a hybrid approach and run the application in a public cloud, but store the data in a private cloud.
- **Transaction volume and volatility.** Public cloud solutions can help businesses with applications that have a high volume of transactions, especially if they peak during specific times of the year. Examples of this include ecommerce requirements, especially for the holiday season. Public cloud solutions can enable you to more cost-effectively scale up and scale out to meet the real-time performance requirements for these peak periods.

SECTION 6: CHOOSING A CLOUD SERVICES PROVIDER

Determining which *cloud provider* to work with depends in part on the outcomes of the decision-making process above, and whether you decide to take a public, private or hybrid cloud approach. For instance, if you want to migrate your existing ERP to a private cloud, you'll want a provider with a proven track record in deploying and configuring that particular application in a private cloud.

Although there are different "types" of service providers—ranging from telecom vendors to hosting providers to traditional outsourcers—midmarket businesses should examine how well a provider can align with their needs. Some service providers concentrate primarily on larger enterprises, while others focus on serving smaller organizations.

However, some common considerations come into play, as shown in **Figure 4**.

Figure 4: Considerations for Selecting a Cloud Services Provide

Assessment Criteria	What to Look For
Uptime	<ul style="list-style-type: none"> • Minimum 99.9% uptime SLA guarantee • SLA for time to repair outages • Financial penalties if the provider fails to meet SLA
Infrastructure	<ul style="list-style-type: none"> • Virtualization technologies and vendors supported • Support for a migration to a private cloud (typically VMware-based) • Compute systems support your specific business applications, especially those that may require high-performance or high-transaction support • Scalability, performance and integration of virtual storage solutions
Change management	<ul style="list-style-type: none"> • Defined and documented change control process for scheduled maintenance, upgrades and security patches
Security and monitoring	<ul style="list-style-type: none"> • Defined and documented physical (data center) and virtual security and monitoring practices • Protection against unauthorized physical and digital access • Protection against contagion from other users • Protection against service disruptions and data loss
Backup and archival	<ul style="list-style-type: none"> • Parameters and location for the backed-up and archived data • Option for you as the data owner to govern archival methods, backup solution(s) used, and whether it conforms to your company's backup application should you need direct access to the data • Backup schedule and disaster recovery plan for your data • Clarification as to who is responsible for specific backup and archival procedures
Interoperability	<ul style="list-style-type: none"> • Support and services for heterogeneous operating systems, security patch deployment and system management/monitoring • Support for interoperability among the provider's own public and private clouds, other public clouds and, if applicable, a private cloud at your own data center
Migration	<ul style="list-style-type: none"> • Services to help migrate workloads to the cloud • Services to move on-premises virtual machines to the cloud
Scalability	<ul style="list-style-type: none"> • Requirements, support and ease of scaling CPU, memory, storage, bandwidth, users, etc.—up or down
Business continuity	<ul style="list-style-type: none"> • Redundant data centers to support outages • Disaster recovery services
Visibility	<ul style="list-style-type: none"> • Easy-to-access, real-time visibility into performance, uptime, security, etc.

Open standards	<ul style="list-style-type: none"> • Support for open standards to protect cloud investments and reduce the risk of lock-in to a specific vendor
Service and support	<ul style="list-style-type: none"> • What is included in the standard service agreement (e.g., community forums, live chat, phone) • When these resources are available (e.g., 24/7/365 or other) • What premium services are available and the costs • SLAs for problem response and resolution • Whether the provider offers professional services to provide the guidance necessary to successfully plan, implement and use the cloud service • Whether the provider has both the technical and business expertise to successfully guide you

Source: SMB Group, 2012

Of course, you need to do your homework to validate a provider’s capabilities. You should ask for and expect the vendor to supply clear SLAs, reports, certifications and audit information during the evaluation process.

Remember that standard SLAs can usually be negotiated. For instance, if the standard uptime agreement isn’t up to snuff, or you require a higher degree of technical support, you can often write that into the contract—and pay for those added services.

SECTION 7: CONSIDERATIONS FOR DEPLOYING AND RUNNING YOUR OWN PRIVATE CLOUD

Interest in the private cloud is growing, especially in industries that have more rigorous security and compliance requirements. But deploying, operating and managing a private cloud is different from running a traditional data center. Although a detailed analysis of the assessment process is beyond the scope of this paper, important considerations include:

- **Map current IT organization resources and capabilities to private cloud requirements.** Increasing your dependence on virtualization likely means that you are moving more mission-critical applications and workloads to the virtualized environment. Although virtualization reduces the number of physical servers, the number of virtual server instances will likely increase. If your company has only limited experience with virtualization, you’ll need to invest in training and education to develop a new management approach specific to a private cloud environment. Specifically, IT will need to coordinate and align security, applications, server, storage, networking and operations to a service model and service level agreements. Evaluate and identify additional capabilities you need to bring to the task, and get hiring and training under way to fill any gaps.

- **Involve business stakeholders early on.** It's critical to understand what service levels users will require and build this into the planning process. You must also account for regulatory requirements for data storage and management that the business mandates, and develop a plan to accommodate them. In addition, you'll need to determine which application components and data are mission-critical, and optimize performance, backup and disaster recovery for them. Finally, make sure that you understand what scalability requirements business stakeholders deem necessary for applications and processing in the private cloud.
- **Assess which technology solutions are best suited to your requirements.** First, evaluate which of the different virtualization technologies that support private clouds take the approach most aligned with your needs for availability, scalability, backup and performance optimization. Efficient, high-performance storage infrastructure is an essential component to accommodate server performance gains and additional backup requirements. Also consider what is entailed in migrating existing applications and workloads to virtual machines, and whether mirrored private cloud environments are supported. Then, examine what's involved in setting up the private cloud and migrating data and applications to it. You'll also want to look at how the vendor and/or its partners provide support for these tasks. Next, consider how easy the management tools are to use and what learning curve your staff will require. For most midmarket companies, implementing an integrated, comprehensive private cloud solution makes more sense than having to piece together, learn and integrate different point solutions—and makes it easier to get visibility into and reporting for the entire environment. Look for an intuitive user interface and integration capabilities with other systems that you already use. Solutions should provide discovery and reporting, capacity planning, self-service options, life-cycle management, change and configuration management, resource optimization and policy automation.
- **Calculate total cost of ownership.** Understand the specifics of the hardware, software and services costs involved in building your private cloud. Because you are spending money up front for infrastructure, consulting and possibly additional IT staff, initial costs to deploy a private cloud on-premises will be higher than if you use the assets of a service provider. The total cost of ownership for a private cloud may be less over time, but this is dependent on many variables and beyond the scope of this paper.
- **Use automated management solutions to ease administration.** Limitlessly adding IT staff is not a viable approach for most midmarket companies. This means you'll need automated management and reporting capabilities to help IT manage the private cloud more proactively and effectively. Automating administrative tasks such as provisioning, decommissioning, capacity planning and alerting can help you manage the private cloud with fewer IT staff members and also improve service.

Midmarket companies need to take a planned and pragmatic approach in this area. Spending more time to assess and evaluate requirements and alternatives up front will pay off in the long run in terms of getting the right solution and better outcomes.

SMB GROUP SUMMARY AND PERSPECTIVE

Looking over the immediate horizon, cloud computing offers midmarket companies a fresh approach to tackle their key business and technology challenges (**Figure 5**), and ultimately transform the way we think about and use IT in our businesses.

Figure 5: Top Midmarket Business and Technology Challenges



Source: 2011 Small and Medium Business Routes to Market Study, SMB Group

The speed, agility and scalability that the cloud model offers stands in stark contrast to the limits imposed by a traditional data center and IT infrastructure approach. As a result, cloud computing gives midmarket businesses an unprecedented ability to seize new market opportunities, diversify and enter new markets.

However, the cloud is not homogenous, and no two companies have the same needs or will take the same path. The bottom line is that each business must chart its own course to the cloud. While business decision-makers often initiate the march to the cloud, IT guidance and

engagement are critical to ensure successful implementation of cloud and virtualization strategies. Both business and IT leaders need to come together to create cross-functional working teams to ensure that business needs for speed and flexibility are met without compromising requirements for security, reliability and performance.

At the same time, the cloud is still largely uncharted territory for most midmarket businesses. Regardless of the workload or cloud environment, it's essential to work with a provider that can not only deploy, manage and support your cloud and virtualization requirements today, but also help you build a road map for the future.



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