

The 2011 Focus Experts' Guide to Cloud Computing: Server Capacity

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Section 1: Introduction

Large or small, if your organization is facing computing needs that are growing or that can grow and contract dramatically and suddenly, this Focus Experts' Guide is for you. It will help you to understand what cloud-based server capacity is, how to decide if it can help your business and how to pick the best solution for your specific needs. Here's what follows:

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Section 2: Meet the Experts

The analysis and recommendations in this Guide are based upon the opinions and experience of a group of Experts selected from the Focus Expert Network. More than 5,000 business experts contribute questions, answers, Focus Briefs and other content to Focus.com, expertise freely available to all. More information about the Focus Expert Network is available at www.focus.com. Below are brief biographies of the Focus Experts who contributed to this Guide.

Lead Expert: Michael Dortch

(<http://www.focus.com/profiles/michael-dortch/public/>)

Michael has spent more than three decades translating what technical people say and do into language that nontechnical businesspeople and consumers can understand and upon which they can act. Before joining Focus as director of research, Michael was most recently principal analyst and managing editor of DortchOnIT.com, "an independent voice for technology-dependent people." Michael has also been a senior analyst at Aberdeen Group, Robert Frances Group (RFG), and Yankee Group.

Michael has helped established and emerging vendors craft go-to-market messages and strategies aligned with users' goals and needs, and companies of all sizes and types to choose and deploy IT solutions more successfully. In 1990, he wrote *The ABCs of Local-Area Networks* (remember those?), a book published internationally in three languages by Sybex, Inc. A transplanted "Noo Yawker," Michael lives about 50 miles north of San Francisco in beautiful Santa Rosa, California.

Contributing Expert: Andrew Baker

(<http://www.focus.com/profiles/andrew-baker/public/>)

Andrew Baker is a hands-on IT leader with expertise in designing, deploying and maintaining secure networks for enterprise of all sizes. For over a decade, he has created competitive advantage for organizations through effective IT leadership, implementation of effective processes, and the architecture of robust business solutions.

In addition to successfully leading IT teams for organizations such as ARG1, Warner Music Group, The Princeton Review, Bear Stearns, About.com and Lewco Securities, Andrew has served for over 15 years as a trusted technology adviser to small and midsize organizations in several industries including media and entertainment, financial services, legal services and social services.

Contributing Expert: Tim Negris

(<http://www.focus.com/profiles/tim-negrис/public/>)

Tim is a technology executive with expertise in software development tools, database, networking, social media, cloud computing, mobile apps and other enabling technologies for enterprise, SMB and public sector customers. He is widely recognized for his ability to rapidly translate complex technical information and concepts into compelling, actionable knowledge. While working for Larry Ellison at Oracle, he coined the term "thin client" and contributed to the conception of the now-ubiquitous server-centric computing model. In addition to serving as a vice president at Oracle, he has twice been a software company CEO and has held executive and strategic consulting roles at Dell, HP, IBM, Sybase and a number of research organizations and startup companies.

Section 3: Essentials

What Are We Talking About Here?

Cloud-based server capacity is essentially the ability to run programs and computing workloads on computers your business doesn't have to buy, operate or maintain. A range of established and emerging vendors offer a broad variety of cloud-based server capacity solutions designed to support a wide range of computing tasks.

Cloud-based Server Capacity: The Top Reasons Why Businesses Buy

If any of these apply to your business, you should explore cloud-based server capacity solutions. The reasons listed are based on interviews with Focus Experts, discussions within the Focus Community at Focus.com and analysis of industry events.

- To be more responsive to business threats and opportunities
- To handle planned and unplanned variations in server capacity needs rapidly and cost-effectively
- Because you need/want to pay for server capacity on demand
- To have an IT infrastructure that is more resilient and easier to maintain.
- To improve the return on their overall IT investments
- To reduce the need for in-house technology infrastructure and associated staff
- Cloud-based and Traditionally Hosted Server Capacity

Cloud-based server capacity is one of the many IT resources available to businesses large and small from a number of suppliers, delivered using technologies known collectively as "cloud computing." The [National Institute of Standards and Technology \(NIST\)](#), an agency of the U.S. Commerce Department, describes three delivery models for cloud-based computing resources:

- **Infrastructure as a Service (IaaS)** — fundamental computing resources, such as server and storage capacity;
- **Platform as a Service (PaaS)** — application and computing frameworks, such as those used for development and testing; and
- **Software as a Service (SaaS)**— applications and business logic, such as tools for CRM.

Cloud-based server capacity is a subset of NIST's IaaS delivery model, and may be best thought of as an evolution and extension of the market for more traditional hosted server solutions. Hosted server capacity solutions come in multiple flavors, from shared to virtual to fully dedicated. In fact, many hosted services are increasingly offered via cloud-based infrastructures, making distinctions among cloud-based and hosted server capacity solutions difficult at best. (Discussion of hosting and the above categories continues in "The Market," Section 4 of this Guide.)

In this Guide, when we say "cloud-based server" offerings, we mean that users rely largely or entirely upon public cloud or Internet/Web resources for access to those services. Business access to such services is therefore subject to being affected by most to all of the strengths and weaknesses of the public Internet and World Wide Web.

Also, availability, reliability and/or pricing of cloud-based server capacity offerings may vary with your company's proximity to providers' data centers or other geographic factors. (For example, companies in the European Union must obtain cloud computing services from providers within the Union.) And cloud-based server capacity offerings may or may not support or include integrated backup and disaster recovery features. However, all business-critical cloud-based computing efforts must be included in your backup and recovery plans. (For more information, see the [Focus Buyer's Guide: Midmarket/Enterprise Backup & Recovery](#).)

Cloud-based Server Capacity: What Type of Buyer Are You?

For the purposes of using this Guide, your Buyer Type is determined primarily by the types of workloads and servers your company uses and needs. You are a Basic Buyer of cloud-based server capacity if your company:

- is currently evaluating or already using SaaS solutions such as CRM or collaboration applications but is using few or no IaaS or PaaS solutions;
- has little or no need for servers to run any specialized applications or workloads; and/or
- does little or no internal software development, modification or testing.

In contrast, you are an Advanced Buyer of cloud-based server capacity if your company:

- is already using IaaS or PaaS solutions, whether or not SaaS solutions are in use;
- uses hosted or premise-based servers to run any specialized apps or workloads; and/or
- does any internal software development, modification or testing.

Below are 10 things you should know before beginning your search for cloud-based server capacity solutions, as well as summary descriptions of why businesses buy and key market characteristics and trends. Detailed discussions of how best to assess your needs and key solution, cost and vendor considerations follow immediately.

Cloud-based Server Capacity: 10 Things You Need to Know

- 1. It's not just for small or resource-constrained companies.** Larger companies use cloud-based server capacity to prototype and test new applications and services, and to respond to sudden changes in capacity needs.
- 2. It's not just for larger enterprises.** Small and midsize businesses (SMBs) use cloud-based server capacity to meet core or exceptional requirements while minimizing the need for costly internal or contract IT management expertise.
- 3. It's similar to traditional hosted server capacity.** This means that it can be relatively easy to buy, especially from hosting providers familiar to you.
- 4. It's very different from traditional hosting.** This means that it can be challenging to integrate with current IT management, security or purchasing practices or other IT infrastructure elements.
- 5. It requires management — different management.** Instead of managing servers, cloud-based server capacity offerings require that you manage provider relationships, service level commitments and integration with current resources. These challenges often require far different skills and personalities than those needed to manage premise-based servers.

6. It's changing constantly. The market is very much in flux, and will be for at least another 18 to 24 months. This means that any decision you make must be supported by multiple safety nets (technological, contractual and operational) to keep your business running no matter what happens to your chosen provider(s).

7. "It's who you know" — and where you are. The provider or reseller with whom you deal most directly and its ability to understand your business needs matter much more than any technological details. Also, availability, reliability and pricing of cloud-based server capacity, like many hosted services, can be greatly affected by proximity to provider data centers and support resources.

8. Start from your strengths. If you have a good relationship with a trusted provider, start discussing cloud-based server offerings with that vendor first. It's an approach more likely to be closely aligned with your business needs than starting with a provider who doesn't know your business.

9. You can start small. Pick a single project to begin with cloud-based server capacity, preferably one that is not business-critical but that could deliver important business benefits if successful. Remember that cloud-based server capacity is as easy to turn off as it is to turn on — or at least it should be.

10. You should think ahead. Even while starting with a single small project, keep your eyes and ears open for other opportunities to put cloud-based server capacity to work for your business. Your first effort may not always be your best effort.

The Cloud-based Server Capacity Market: Key Characteristics

- **Crowded** — thousands of vendors, few with truly "cloud-scale" reach
- **Competitive** — severe price/feature competition, increasing specialization
- **Confusing** — packaging options, pricing opacity make direct comparisons difficult

The Cloud-based Server Capacity Market: Key Trends

- The **current economic climate** is **accelerating consolidation** among cloud-based/hosted server capacity providers and adoption of cloud technologies by providers and users.
- The industry transition from Internet Protocol version 4 (IPv4) to IPv6 will be rushed, painful, dangerous, and costly.
- So-called "**green IT**" is **cloud computing's secret weapon**, especially for operators of large and/or multiple **data centers**, whether users or providers.

Cloud-based Server Capacity Providers: Key Areas to Question

- **Security** — Can you protect my critical data?
- **Privacy** — Can you assure compliance with privacy protection requirements?
- **Continuity** — Can you assure me of rapid resilience to and recovery from disruptions?
- **Performance** — Can you meet my business's availability and performance requirements?

Section 4: The Market

Overview

Public cloud computing follows dedicated and shared hosting as another way to obtain on-demand server capacity without having to purchase or lease server hardware. It is important to remember that cloud computing is not categorically better than those other solutions. It is just different. For many workloads, applications and budgets, shared or dedicated hosting may in fact be preferable to cloud-based solutions. Also, many established shared/dedicated hosting service providers have now added cloud services to their offerings, creating another kind of overlap between these three kinds of on-demand server capacity solutions.

In this section, we will look at the market which comprises all three solution types, examining current conditions and near-term trends, and looking at a selection of representative established and emerging solution providers.

Market Challenges

1. Crowded

There are many thousands of hosting companies and hundreds of cloud service providers, making considerable consolidation and attrition inevitable. The former often brings jarring changes to plan features and pricing, and the latter forces customers to quickly find and switch to new providers.

2. Competitive

The crowded market state has bred severe price and feature competition among vendors, and, especially among the hosting vendors, it has also brought increasing specialization in terms of application focus. As a result, customers can find services closely matched to their needs for a very low price.

3. Confusing

In order to differentiate themselves, many companies have become quite individualistic in their packaging and pricing, making direct comparison of different providers very difficult. For hosting, however, there are thousands of "top 10 hosting" review sites on the Web that make it easier to identify and compare the best choices. The cloud side is less populous, but, due to its hype and unfamiliar technology, no less confusing — making resources like this Guide invaluable to the shopping process.

Business Rewards

Though the market is chaotic in many respects, the benefits of cloud-based server capacity are still attracting interest from companies large and small. Some of the key business benefits include increased responsiveness, resilience and ROI.

1. Responsiveness

Being able to "dial up" new server capacity at low, incremental cost allows a business to quickly respond to changing conditions and new opportunities. Most importantly, it also enables smaller businesses to compete with larger ones in a way that previous generations of automation technology did not. Indeed, it is the thing most responsible for the e-commerce revolution and the "long tail" of specialty "e-tailing."

2. Resilience

Premises-based IT, especially in smaller businesses, is very brittle; server hardware and software failures or security breaches can cripple big companies and kill small ones. Effectively protecting against failures and breaches requires costly additional hardware, personnel and skills. “Capacity as a service” places things like hot sites, RAID storage, sophisticated security, and more in the hands of even the smallest companies.

3. ROI

The business case for server hosting and cloud computing services cannot be overstated, as it can have a dramatic, rapid positive impact on many expense lines of the balance sheet, including sales, marketing, operations, customer service, capital expense and more. This is because it delivers logarithmically incremental computing power against a linear one for cost.

Key Market Trends

1. The recession is accelerating consolidation among providers and cloud adoption among providers and users.

Dedicated hosting is being disproportionately affected in a negative way by the ongoing recession. Downward pricing pressure is forcing the big providers to get bigger by acquiring the smaller ones who can no longer go it alone. Meanwhile, the recession is the best thing to happen to cloud computing. Unlike both in-house IT and traditional hosting, cloud services eliminate the need for users to purchase contingent computing capacity that must go idle during off-peak business cycle periods, making it especially irresistible in bad times.

2. The transition from Internet Protocol version 4 (IPv4) to IPv6 will be rushed, painful, dangerous and costly.

Within about a year, the supply of unassigned IP addresses will be completely exhausted. This means that the only way a new server can be connected to the Internet will be either by reusing an existing, unused address under the current version 4 of the Internet Protocol, or by adopting IPv6. The IPv6 option requires extensive upgrades to networking hardware, operating systems, applications and network management tools and skills.

Explosive adoption of smart phones, distributed embedded systems and, ironically, public cloud computing have brought IPv4 address exhaustion ahead of schedule. Also, the two protocol versions are incompatible and so must be supported simultaneously by network services providers. While IPv6 has features that will ultimately make it much more secure than IPv4, numerous, serious vulnerabilities are expected during its adoption. All of this means more hosting consolidation, operational complexity, heightened risk, and higher overall costs for users.

3. So-called “green IT” is cloud computing’s “secret weapon.”

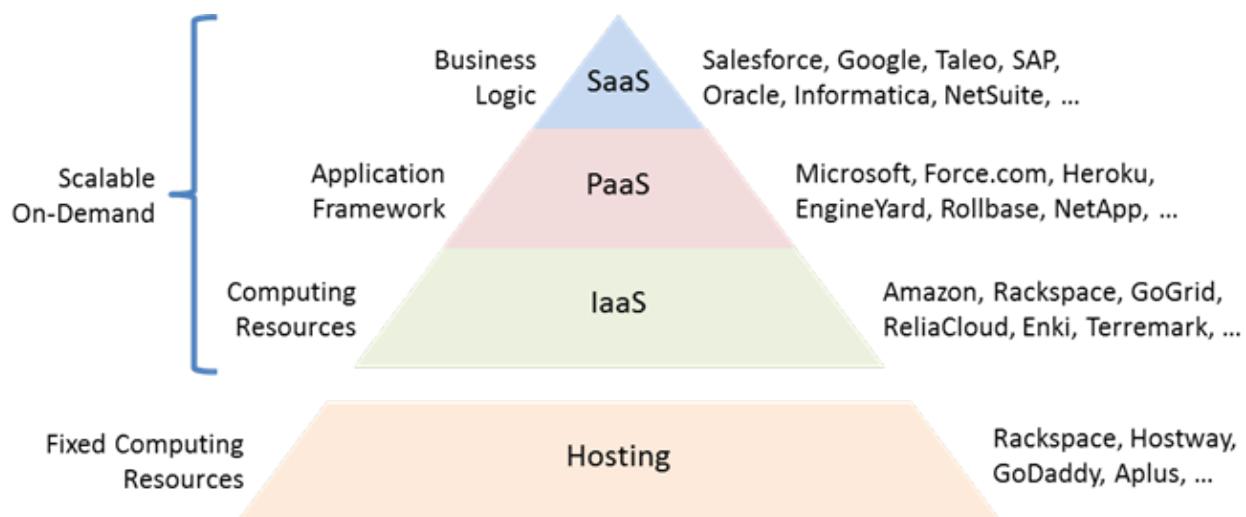
Neither premise-based nor traditionally hosted server capacity comes close to cloud computing’s potential for energy savings. Its fine-grained virtualization and on-the-fly provisioning can eliminate idle hardware throughout the configuration, while its physical configuration density can substantially lower cooling requirements.

Vendor Landscape

As stated previously, this is a very crowded, competitive, confusing market, characterized by a high degree of consolidation and attrition. In addition, although in the nascent cloud sub-segment there are a number of well-established early leaders, there is also a daily rush of impressive new companies entering it. So, in short, the size or time in business of a company in this market does not necessarily correspond to its relative importance to solution hunters. Furthermore, the vendor set that would be of interest to large enterprise customers is very different from that for SMBs.

The market for on-demand server capacity and capability divides into two main parts: traditional hosting and cloud services. Hosting takes a variety of forms — shared, virtual private servers, dedicated servers and so forth. But, from the user's point of view, they are functionally the same and most hosting companies offer some combination of such offerings. Cloud services, on the other hand, has three functionally distinct sub-segments: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Each one plays a different role in the user's IT context and has mostly different solution providers within it, as illustrated in Figure 4.1. A useful mnemonic for remembering the components of the on-demand server market is "HIPS," for Hosting, IaaS, PaaS and SaaS.

Figure 4.1: The "HIPS" Market Landscape



Four Key Areas of Focus When Questioning Vendors

Think twice about doing business with any service provider who does not encourage you to ask questions such as the following before you sign up, or who cannot or will not answer them.

Security

Most of the security threats you might encounter in using a service provider are the same as those that would concern you in relation to your in-house IT systems and infrastructure. These include unauthorized access, data theft, viruses and other malware, and distributed denial of service (DDoS) attacks. However, some of these threats can have a greater likelihood and severity in a shared computing environment with broader exposure to the Internet.

- What equipment, software, personnel and procedures do you have in place to prevent, minimize, escalate, respond to and recover from the execution of security threats?
- What security management and compliance certifications do your facilities and personnel have in place and are they up to date?
- Is there a member of your executive team or senior staff responsible for security management and assurance and what is his/her name, email address and phone number?

Privacy

Some business privacy concerns will be more obvious than others when making the transition to services-based IT. For example, whether driven by common sense or specific regulations, the need for assured customer data and email privacy comes quickly to mind, but there are other types of privacy that are easy to take for granted or overlook entirely when making this transition.

Log files, configuration tables, policy documents, and employee data are just a handful of the many kinds of information that are subject to greater risk of exposure in a services-based context than they would have been if managed entirely in house. Also, the laws governing data subpoenas, e-discovery and the like are different when information leaves your private physical custody; if that is a specific concern for your business, be sure to have your attorney review your service level agreement (SLA) for specific provisions in that regard.

- Where are the physical locations at which my business data will be used and kept, and where my applications will be operated, including primary operations, backup and fail-over sites?
- What operational information, e.g. access and transaction log, user lists, and so forth, are produced and used by your systems and applications, and how are they used, retained and disposed of?
- Who among your operational and management personnel will have access to my business data and operational data pertaining to my account and applications, and how are they vetted?

Continuity

In your business, hopefully you are as prepared as you can be for the occurrence of natural disasters, criminal attacks, infrastructure failures and other events that have the potential to seriously interrupt your business operations. It is imperative that any service provider on whom you will rely to manage your essential business data and applications is equally or better prepared for those same events. Also, the business failure of a service provider can affect your business continuity at least as much as any flood, fire or felony and should be added to the list of your concerns in this regard.

- What are the specific types of business interruption events for which you have formal response plans and processes in place, e.g. flood, fire, DDoS, electrical failure and so forth?
- What kinds and levels of business continuity insurance do you carry for your business?
- Do you have backup escrows or other provisions for ensuring that I can access my data in the event of the prolonged interruption or failure of your business?

Performance

Shared hosting and multi-tenant cloud environments are especially prone to conditions where a problem pertaining to another user, or a system or network problem can affect the throughput and performance you get from the service. And, in all types of services, peak and excess demands on their systems and the infrastructure, planned and unplanned downtime, hardware and software upgrades, and other things can also affect the performance you experience. All prospective service providers should offer some kind of serviced level agreement (SLA) that details the throughput and reliability you can expect and what is your recourse if those expectations are not met. But, the SLA may not answer some key questions.

- How do you measure and monitor the performance and throughput of the CPU, memory and storage transfers, and network connections within your infrastructure?
- What is the speed and who is the provider of the network fiber to which your facilities are connected?
- Does your service rely on contracted intermediate service providers, e.g. video transcoding, who play a material role in assuring my performance level, and what is your SLA with them?

Section 5: Your Needs

Knowing Your Requirements

Whether you are a Basic or Advanced Buyer, on-demand server capacity in all its forms across the HIPS market landscape can play various roles in your company's in-house IT infrastructure.

1. Support

Managing, protecting or sustaining the existing IT infrastructure, e.g. system and data backup, document archiving, network security, mobile messaging, etc.

2. Supplement

Extending the power, scale or functionality of existing IT capabilities, e.g. CPU-intensive calculation, added working storage, adding new Web sites and applications, etc.

3. Supplant

Replacing in-house systems and applications with ones on hosted or cloud-based equivalents, e.g. branch office systems, sales force automation, content management, etc.

The other dimension of your requirements is, of course, the specific kinds of HIPS services you will need. Correlating those with the above service roles in a matrix will provide a useful planning tool for defining your requirements, as shown in this example for a subscription media service.

Figure 5.1: Applications Requirements Target Matrix

	SUPPORT	SUPPLEMENT	SUPPLANT
HOSTING (SHARED)			Affiliate Support Portal
HOSTING (DEDICATED)	Audio/Video Streaming		
INFRASTRUCTURE SERVICES	Mobile User Access	Media File Storage	
PLATFORM SERVICES		Optimized Transcoding	
SAAS APPLICATIONS			Manage Subscriptions

Knowing Your Capabilities

In relation to whatever your needs are for services-based server capacity solutions, one of the most important considerations is of what you can do with your own in-house or contracted resources, versus the tasks and processes you can or must rely on the service vendor or its contractors to provide.

For example, if you have a one-time need to build and deploy a simple Web site on a shared host, the service you choose will probably offer optional services for designing and building the site. But if you will be deploying a complex custom site with e-commerce Web services in an infrastructure cloud (such as Amazon.com's EC2), you may rely on contract programmers to build and deploy it, and then use your own staff to manage and maintain it.

Also, different service types vary in terms of what users are allowed to do with it, how much it can be customized, how complex it is to set up and maintain, and so forth. Once you have determined your needs in terms of which HIPS services you will be using and what role they will play in your IT context, you should determine what kind of skills they will require, using the following chart.

Figure 5.2: Skills Requirements Target Matrix

	SYSTEMS/NETWORK	WEB SITE	APPLICATION	BUSINESS
HOSTING (SHARED)	No	Yes	Maybe	No
HOSTING (DEDICATED)	Yes	Yes	Maybe	No
IAAS	Yes	Maybe	Yes	No
PAAS	No	No	Yes	Maybe
SAAS	No	No	No	Yes

Using the above information and matrices as guidelines, you can develop an accurate assessment of your company's needs, opportunities and constraints related to cloud-based server capacity. The same approaches can be replicated and scaled across numerous other IT and business resources as well.

Section 6: How to Buy: Key Solution, Cost and Vendor Considerations

Solution Considerations

Checklist: 10 Key Features for Basic Buyers and Workloads

- Support for multiple operating systems (including 64-bit support)
- Support for multiple database platforms
- Pre-configured feature bundles for common workloads and scenarios
- Comprehensive, enforceable SLAs
- Various options for backup and recovery
- Ability to scale processing power on the fly, as usage demands
- Strong application market for integrating with third-party SaaS applications in the cloud
- Flexible pricing models, including introductory pricing and consumption-based models
- Support for multiple development technologies such as PHP, Python, Java, .NET
- Multiple interconnected provider data center locations

Checklist: 10 Key Features for Advanced Buyers and Workloads

- All the Key Features for Basic Buyers and Workloads
- Robust portal for monitoring usage and performance
- Robust application programming interfaces (APIs) for managing cloud computing resources programmatically
- Support for virtual private cloud services
- Network load-balancing and clustering
- 10-gigabit Ethernet support and/or high performance computing (HPC) capabilities
- Ability to reconfigure computing resources on the fly, with no data loss (or automated data backup and recovery)
- Automatic failover of resources to remote data centers
- End-to-end encryption
- Ability to control where your data lives

Other Key Solution Considerations

Given that one of the top reasons that businesses buy cloud computing is the desire to minimize the need for reliance on technical staff, you will want your cloud servers to be brought online quickly and easily. Many providers will be able to make resources available within 15 minutes of your turning them “on” — most can do it within 30 minutes.

Integration with third-party applications in the cloud is another big draw, as integration concerns are more complicated in the cloud. Removing the complexity from infrastructure decisions allows the business to focus on its core, and start getting benefits from its technology use more rapidly.

Cost Considerations

Pricing Expectations

Given the wide variety of vendors and their approach to the cloud, pricing options are all over the map. You can get into the cloud computing game for as little as:

- \$0.09-\$0.15 per hour of computing time; plus
- \$0.10-\$0.15 per gigabyte (GB) per month of persistent storage; plus
- \$0.10 per 1,000,000 storage transactions; and
- \$8.99-\$10.99 per GB of database storage.

Moderate usage of a “small computing instance” can cost from \$30 to \$70 per month, depending on your usage patterns. You have a lot of control over your costs by how you make use of the server instances.

However, you should keep in mind that different providers use different pricing models, and may offer wide variations in price for the same or similar-sounding bundles of features and services. In addition, different workloads may require differing mixes of computing resources. These multiple variables make “apples-to-apples” pricing comparisons difficult to impossible. You should use the above figures only as broad guidelines, and get every candidate vendor to spell out all cost and pricing details in writing.

Total Cost of Ownership (TCO)

TCO can vary wildly, unless you’re making use of your server instances for reasonably well-defined workloads. It is fairly easy to calculate your total cost of ownership if you are relying on cloud computing simply to reduce your costs pertaining to in-house infrastructure and to better manage the provisioning of servers. If, however, your use of cloud servers is primarily to deal with people loads that you cannot accurately predict, then your pricing will necessarily vary. You will need to rely on several months’ worth of data to establish patterns that might help you calculate TCO for your workload.

One factor that can affect cloud-based server capacity TCO significantly is data transaction costs. It’s not just about storage size. It is possible to pay more in overall storage costs, even though you have purchased less storage, if the number of your transactions is excessive. Also consider that some vendors, like Amazon.com, will charge you for moving data into and out of their cloud-based server environment, in addition to charging for actual resource usage.

TCO is difficult to compare across multiple vendors due to the different ways in which they charge for their services. First, you must know how you are using your existing resources today. If this is a new venture, then you need to make some reasonable estimation of the usage you expect, including CPU, storage size, number of transactions and bandwidth usage. Use these values to determine how much your vendors under consideration would cost. This will enable you to project TCO.

Return on Investment (ROI)

So, how to determine ROI? Take the numbers you obtained from the previous exercise and use them in your normal ROI projections. If you don’t currently calculate ROI, then compare your projections against your normal hosting costs, and the difference is your savings. Be sure to include staff and infrastructure costs such as electricity, A/C and hardware/bandwidth that are not being consumed in-house.

Vendor Considerations

There is a great deal of competition in the hosting and IaaS segments of this market, and thus prices are in a relatively tight band for computing services. On the support end, however, there is a wide range of offerings. Some vendors treat this market as a commodity, and therefore offer little in the way of support beyond email and forums. Other vendors offer robust support options including full management of the server environment. In general, the lower your overall costs for service and support, the less support you should expect.

In the PaaS and SaaS segments, while there are many players today, there is not the same ability to compare the vendors directly, due to differences in methodology, underlying platform and applications supported. With these vendors, it becomes more important to kick the tires, review their partners, obtain references, and work with resellers or integrators that you are already comfortable with. Everyone claims to offer the support and handholding that you and your business need, but this has to be evaluated.

While the reputation of the vendor is important in your considerations, you must remember that this is a large market that will see much consolidation over the next few years. Vendors who are otherwise financially viable might elect to sell off their cloud services/products, or might purchase a smaller vendor that has better technology in some way. At this point, you might find yourself being forced to migrate to continue your services in the manner that you would prefer.

One way to mitigate this is by working closely with an established value-added reseller (VAR) or systems integrator that has experience with multiple cloud providers and deployments. You should combine this approach with strong, clear contractual protections and a focus on offerings based on widely adopted and supported technologies. These steps will all help to insulate your company from turbulence resulting from changes to or affecting your chosen vendor(s).

Partner Ecosystems

A major value proposition of the cloud is that the ecosystem eases integration for the customer. Of course, this is dependent on the size and robustness of the cloud provider's ecosystem. The SaaS arena, which is the most mature area of the cloud computing market, has some players such as Salesforce.com with substantial partner ecosystems.

You want to look for cloud-based server capacity providers who have a powerful and flexible API, and are partnering with vendors to produce solutions that will enhance their offering to the marketplace. For the customer, the advantages of a robust partner ecosystem include:

- **Flexibility:** More add-ons to choose from, at better prices.
- **Viability:** A greater chance that the cloud vendor will survive and grow.
- **Standardization:** Better APIs for integration.

Shared hosting providers will have the smallest partner ecosystems, which usually consist of a set of applications for which they provide some integration and that can be easily installed on their hosted servers. For example, many hosting providers have one-click installations of popular database application or content management systems (CMSes), or other Web-enabled apps.

IaaS and PaaS providers tend to have the largest ecosystems, if only because of the functionality that their service offerings are intended to provide. Platform providers, in particular, are looking to create a plug-in replacement for at least some of your operating system needs. So in addition to the API focus

SaaS vendors have, PaaS and some IaaS vendors also work toward certification of applications and solutions that would need to run in/on their platform.

You can expect that vendor support for a broad range of solutions will be more likely with the PaaS and IaaS providers than with SaaS providers. Expertise for solution architecting will vary with shared hosting providers, depending on whether they are largely self-service or full-service providers. Typically, the price of their services, and the segment of the market they target, will be a key indicator.

Cloud providers that offer APIs, support for integration and certification will tend to develop larger partner ecosystems than those who do not.

Support Considerations

The SaaS and PaaS providers will tend to be the most sophisticated, and offer enterprise-grade support options, as they are closer to the business logic of their customers. Their support will include both IT expertise and business knowledge — sometimes within several verticals, depending on the nature of the product they provide. SaaS and PaaS providers tend to support larger businesses, and this is reflected in their service options.

Look for vendors with **large partner ecosystems**, as there will be more support avenues for their services, including community-based support.

Of all the cloud provider segments, PaaS is the one in which great support is the most important, given how dependent your organization will be on the services provided, and how integrated those services are into the provider's overall architecture. **Strong SLAs with clear language, penalties and "escape" clauses** are key here.

It is important to **look for both official and unofficial avenues of support when evaluating cloud providers**. Platforms and services that are highly regarded in the industry will generate several avenues of community support. These sources can be tapped to get a good idea of the quality of solutions provided by the vendor *and* the product/service. Additionally, strong community support tends to indicate or ensure strong viability of the solution, which protects your investment in that product or service.

Checklist: 10 Key Questions to Ask Every Candidate Supplier

- What are your IT and Information Security operational policies (including SLA), and when can I review them with our respective legal teams?
- Where will my data be kept, and can I stipulate that it not be kept in certain places?
- Who in your organization has admin level access to my data and/or logs?
- Who are your closest competitors, and what differentiates your offering from theirs?
- From a monitoring, log management and backups perspective, what customer data is comingled?
- What regulatory compliance requirements are you subject to, and do you have any certification of compliance?
- How do you measure and ensure performance of server instances?
- What are our options for price stabilization over a 6-to-12-month period?
- What is your road map for cloud computing for the next 24 to 36 months, including partner integration?
- What happens in the event that your organization changes ownership or sells this portion of the business?

Section 7: The Focus Short List

The Focus Experts who created this Guide recommend the following specific offerings for Basic and Advanced Buyers of cloud-based server capacity.

Focus.com Cloud-based Server Capacity Recommendations for Basic Buyers

RECOMMENDATIONS	EXPERT COMMENTS
Amazon Elastic Compute Cloud (Ec2)	Baker: "As one of the pioneers of cloud server computing, Amazon.com makes it very easy to get started in the cloud. Whether you need a Windows-based system or a Linux-based system, you can be up and running in no time at all. Given its decent pricing, international support, and its great reliability, Amazon.com should be seriously considered by Basic Buyers."
AT&T Synaptic Compute As A Service	Dortch: "AT&T's offering is comprehensive and flexible and its pricing is competitive. AT&T also knows things about customer support and partner ecosystem development that many cloud solution providers have yet to learn. This makes AT&T worth serious consideration by Basic Buyers, especially those at companies that already have successful relationships with AT&T."
Microsoft Windows Azure	Baker: "While Microsoft Azure is generally regarded as a PaaS [solution], it legitimately fits in the IaaS space as well. Microsoft possesses a fairly robust partner ecosystem, including Azure integration with a number of popular SaaS applications. This makes Microsoft a viable candidate for Basic Buyers, in place of, or in conjunction with Amazon.com, especially for pure Windows environments."
Rackspace Cloud	Negris: "Rackspace is a well-established hosting service, known for its maniacal focus on customer service. The company's cloud-based services include turnkey packages for storage (cloudfiles), Web sites (cloudsites), and raw servers. The cloud-based server offering is positioned as a head-to-head competitor of Amazon EC2 (as shown at the link http://tinyurl.com/p9mavm). The service emphasizes standards, ease of use, SLAs, performance and fine-grained pricing increments."

Focus.com Cloud-based Server Capacity Recommendations for Advanced Buyers

RECOMMENDATIONS	EXPERT COMMENTS
Amazon Elastic Compute Cloud (Ec2)	<p>Dortch: "Amazon.com's own Web sites demonstrate every minute of every day how well the company understands the juggling and 'cat-herding' necessary to deliver consistent performance under demanding circumstances. This makes Amazon.com's EC2 offering worthy of serious consideration by Advanced Buyers, if the vendor's promises of availability, performance, security and other business-critical needs can be contractually guaranteed upon and enforced effectively."</p>
Enki	<p>Negris: "Enki offers a variety of high-end cloud services for enterprise customers, high-volume e-businesses, and cloud service resellers. Its emphasis is on managed services, outsourcing and professional services, including virtual private data centers, virtual servers, hosting provider packages, an AppLogic utility computing grid and a variety of consulting and management services. Advanced Buyers, especially large end-user companies and advanced hosting services companies looking for a strategic partner to help them move to cloud computing, should look at Enki."</p>
GoGrid	<p>Negris: "GoGrid is a cloud hosting provider that specializes in complex infrastructure, as in hybrid clouds, mixed-OS environments, and inter-cloud integration. The company positions itself against both Rackspace and Amazon EC2 by providing a combination of features supported by both competitors, as shown at the link http://tinyurl.com/249wnj5, and by combining features from traditional hosting, such as dedicated firewalls, with cloud services. Storage is free for amounts under 10GB, and above that is billed at a fixed charge per GB at the maximum amount stored during the month. The company uses a novel pricing model for cloud (virtual) servers, billing according to "RAM hours," the total amount of memory deployed multiplied by the amount of time it is used."</p>
Rackspace Cloud	<p>Negris: "Rackspace is a well-established hosting service, known for its maniacal focus on customer service. The company's cloud-based services include turnkey packages for storage (cloudfiles), Web sites (cloudsites), and raw servers. The cloud-based server offering is positioned as a head-to-head competitor of Amazon EC2, as shown at the link http://tinyurl.com/p9mavm. The service emphasizes standards, ease of use, SLAs, performance and fine-grained pricing increments."</p>
Terremark Enterprise Cloud	<p>Baker: "Terremark offers state-of-the-art data centers in more than eight countries, with broad support for almost any operating system configuration imaginable. With its focus on large enterprises, industry and regulatory compliance, and its integration with private clouds, Terremark Cloud Services is worth serious consideration by Advanced Buyers, particularly those needing international support."</p>

Section 8: Conclusions

Cloud-based server capacity can deliver significant business benefits to Basic and Advanced Buyers running basic and/or advanced workloads. But some assembly is definitely required. Herewith, some specific recommendations from the Focus Experts who wrote this Guide.

Cloud-Based Server Capacity:

Five Things to Do Before You Begin Your Solution Search:

1. Identify and engage all stakeholders likely to be affected by a cloud-based server capacity solution, and establish mechanisms for gathering and including their input in the decision-making process.
2. Accurately determine your most business-critical workloads and the types of applications and solutions that are or might be candidates for the cloud.
3. Determine if you have any security or regulatory compliance needs that must be accommodated within any chosen cloud-based server capacity solution.
4. Assess the role you want any chosen cloud-based server capacity solution to play — whether it will support, supplement or supplant any current IT deployments.
5. Understand the skills and budget likely to be required by any chosen solution, and ensure that those requirements are in line with your company's expectations and constraints.

Cloud-based Server Capacity Candidate Solutions: Five Things to Investigate

1. Support options, policies, pricing, providers and services
2. Security, especially how server instances are isolated from one another
3. Backup and restoration features, guarantees, options and policies
4. Database support
5. Template-based and other pre-configured server, software and management features and options

Cloud-based Server Capacity Solutions: Five Important Cost-Related Questions

1. How much notice is given before prices are changed?
2. Are there any startup fees in addition to usage fees?
3. How is usage calculated for the purpose of monthly charges?
4. What are the details of all subscription add-ons and up-charges?
5. What are my deployment, management and maintenance personnel requirements and costs going to be?

Cloud-based Server Capacity: Five (More) Critical Vendor Considerations

1. SLA terms and conditions, especially enforcement and “escape” clauses
2. Quality of support
3. Financial stability
4. Geography
5. Partnership-driven integration with other IT solutions (beyond passive support of basic APIs or common file formats)

Cloud-based Server Capacity: Five Dos and Five Don'ts

Do:

1. Ask lots of tough questions.
2. Read all agreements, contracts and specs carefully (get your legal team involved when needed).
3. Talk to multiple existing customers.
4. Perform at least one pilot test.
5. Stay current on the security policies and practices and solution road maps of selected vendors.

Don't:

1. Do too much at once.
2. Start exploring cloud-based server capacity with your most business-critical workloads.
3. Focus only on cost.
4. Use the cloud to do a hosted server's job, or vice versa.
5. Get locked in to long-term contracts until a solution is proven to work for your business.

Appendix: A Field Guide to Hosted and Cloud-Based Server Capacity Solutions

	SHARED HOST	VPS/DEDICATED HOST	PUBLIC CLOUD SERVICES
OPERATING CONTEXT	<ul style="list-style-type: none"> - Designated file directory - Standardized software - Fixed capacity, throughput - Fixed system stack - Single dynamic IP address 	<ul style="list-style-type: none"> - Entire virtual/physical server - User-defined servers and apps - Fixed capacity, throughput - User-defined system stack - Multiple fixed IP addresses 	<ul style="list-style-type: none"> - Virtual servers, resource pool - Capacity/throughput on demand - Fixed or user-defined SW - Single or multiple locations - Single or multiple servers
ADMINISTRATIVE ACCESS	<ul style="list-style-type: none"> - Files, folders, permissions - Server setup, configuration - Process start and stop - User account management - Basic backup and recovery - Activity and mgmt. logs 	<ul style="list-style-type: none"> - All shared hosting accesses - Full root-level system access - Full process, thread control - Hardware device mgmt. - Network connection control - All system info access 	<ul style="list-style-type: none"> - OS, apps, files in instances - Set up, manage, run instances - Web service or root access - Self-service provisioning - Cloud administration APIs - Most hosting accesses
AVAILABLE SOFTWARE CAPABILITIES	<ul style="list-style-type: none"> - Internet domain mgmt. - Web sites and site apps - Email serving and storage - File transfer and storage - Simple e-commerce - SQL RDBMS apps 	<ul style="list-style-type: none"> - All shared hosting capabilities - Software development tools - High performance OSes - Virtual machine support - Advanced storage control - VPN connectivity support 	<ul style="list-style-type: none"> - All shared host capabilities - Most dedicated capabilities - Large scale databases - Advanced messaging - Load balancing controls - Variety of Web services
SECURITY OPTIONS	<ul style="list-style-type: none"> - Passwords on accounts - HTTPS site access - Secure FTP file transfer - SSL certificates - SSH administration - Basic software firewall 	<ul style="list-style-type: none"> - All shared hosting options - Hardware firewall - Intrusion detection - Real-time monitoring - DDoS, malware protection - Full-time human resources 	<ul style="list-style-type: none"> - All shared hosting options - Some dedicated capabilities - Emerging cloud standards - Provider procedures - Optional security services - Data and message encryption
SUBSCRIPTION MODEL	<ul style="list-style-type: none"> - Fixed monthly charges - Fixed resource levels - Up-charges for overages - Multi-level support 	<ul style="list-style-type: none"> - Fixed monthly charges - Fixed resource levels - Managed hosting options - Dedicated account support 	<ul style="list-style-type: none"> - Variable monthly charges - Consumption-based models - Volume and/or time-based - Highly variable support services
TYPICAL APPLICATIONS	<ul style="list-style-type: none"> - Text/graphics Web sites - Email, document sharing - Simple catalogs, commerce - File sharing, distribution - Basic social networking - Web apps (PHP, XML) 	<ul style="list-style-type: none"> - Web 2.0 apps, CMS, blogs - Advanced e-commerce - Rich media, streaming - Applications hosting - Non-Web business apps - Document management 	<ul style="list-style-type: none"> - All shared and dedicated apps - High performance computing - On-demand workforce - Media hosting services - Search engines and parsers - Data and system backup
ADVANTAGES	<ul style="list-style-type: none"> - Low, predictable cost - Easy to set up and manage - Basic, cheap skills needed - Optional professional services 	<ul style="list-style-type: none"> - Lower cost than in-house - Full control of SW and HW - Managed hosting options - Reliable, available, secure 	<ul style="list-style-type: none"> - Pay only for what you use - Unlimited resource scale - Real-time service provisioning - Predictable performance
DISADVANTAGES	<ul style="list-style-type: none"> - Limited customization - Unpredictable performance - No system access - Limited security - No fail-over, redundancy 	<ul style="list-style-type: none"> - No physical server access - Can be costly for simple apps - Fixed hardware choices - No control of service quality - Complex admin and mgmt. 	<ul style="list-style-type: none"> - Security a work in progress - Limited system control - Complex external integration - Unpredictable costs - Cloud skills rare and costly

About Focus Research

Each year U.S. businesses spend more than \$75 trillion* on goods and services. And yet there has not been a definitive source of trustworthy and easily accessible information to support business buyers and decisions makers — especially those in small and midsize businesses. Filling this gap is the mission of Focus Research.

Through its Research Guides, Focus Research empowers buyers to make considered purchases and decisions. Focus does this by providing freely available, actionable advice based on the expertise of other buyers, recognized experts and Focus analysts.

Guiding Principles

Our goal is not only to provide independent and high-quality research but also to deliver a new research model that serves all businesses.

Open

We believe information must be set free. The data, advice and research on Focus are widely distributed and available to everyone.

Peer-powered

We believe in the power of many. Thousands of buyers and experts contribute their expertise to Focus every day. Our job is to take their insights and integrate them into our research.

Practical

We believe in addressing everyday issues facing businesses. Focus Research does not pontificate on high-level trends or promote broad-based research agendas. Rather, Focus Research endeavors to provide specific, actionable recommendations that help businesses make the right decision every time.

Relevant

We believe there is no “one-size-fits-all” answer to a business purchasing decision. Focus Research is, therefore, designed to address specific concerns of multiple Buyer Types across multiple industries. As such, users are encouraged to combine our different research deliverables into tailor-made packages that effectively address their unique needs and goals.

* Source: Visa, Inc. Commercial Consumption Expenditure Index fact sheet