

CLOUD OPPORTUNITIES: INFRASTRUCTURE AS A SERVICE

IaaS can deliver cutting-edge technology to organizations without requiring significant capital costs or hardware installation.

Executive Summary

One of cloud computing's greatest areas of opportunity is Infrastructure as a Service (IaaS). In this approach, vendors offer infrastructure components such as computing, storage, networking and databases in a commoditized fashion. These services provide customers with immediate access to cutting-edge technology without requiring significant capital investments or hardware installation.

IT departments at midsize and large businesses that leverage IaaS can stop performing routine activities such as purchasing, racking and maintaining servers and instead shift their focus toward integrating cloud components to rapidly meet evolving business requirements. Offloading routine data center tasks also allows IT workers to focus on more business-oriented initiatives.

Many providers offer cloud services, and IT managers must have a good understanding of the marketplace. They should select vendors who provide the services that match their technical, business and cost requirements. Selecting a cloud vendor is a major decision that will have a profound impact on the organization's technology operations, security and business processes for years to come.

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The Situation

The IT world is in a period of tremendous change. Many businesses are quickly shifting from a computing model in which they manage massive on-premises data centers to a cloud-centric approach. In the cloud model, outside providers manage portions of the IT infrastructure as a commodity service, freeing up local IT staff to focus on more value-added activities. Indeed, a [2014 State of the Cloud Report](#) from RightScale found that 94 percent of organizations are using cloud computing.

The term cloud computing grew out of the network diagrams that IT staff used for many years. On those diagrams, networks for which the details were irrelevant were depicted using a cloud symbol. The most common example of this was the Internet. Application developers relying on Internet service didn't need to know *how* the Internet worked — they simply needed to know that any site with an Internet connection would be able to access their applications. The cloud on the diagram represented technical details that were important, but handled by someone else.

Cloud computing takes this approach to the next level. It refers to the delivery of any type of computing capability as a service over a network. This may be a very high-level service used directly by end users, such as cloud-based email or calendaring. It may also be an application development platform that allows programmers to create new software without worrying about servers, networks or other delivery details. The cloud also provides raw computing services to organizations, allowing engineers to build scalable computing infrastructures from cloud building blocks, such as server instances, databases and virtual private networks (VPNs).

Businesses adopting a cloud computing model have three basic types of cloud at their disposal:

Public cloud computing uses services located offsite and shared among multiple customers. Companies that use the public cloud may find that their computing services run commingled with those of other customers on the same hardware in shared data centers. For example, HP Helion Public Cloud allows businesses to deploy services and securely operate in the cloud with HP's OpenStack technology, which empowers collaboration and transparency. This scalable, open-source cloud infrastructure provides an operating system to manage computing, storage and networking in the cloud.

Businesses that deploy applications in an open cloud environment have several advantages. This model does not lock the business into one vendor; it supports hybrid cloud architecture and accelerates the time to market for innovative initiatives.

Private cloud computing builds a cloud environment dedicated to a single customer. This may be located on the customer's premises or in an outsourced data center.

Microsoft delivers an outsourced private cloud offering via its Azure service. Azure allows businesses to store data securely while integrating on-premises applications across a global network of Microsoft-managed data centers. The service provides high

IAAS MIGRATION BEST PRACTICES



Organizations planning to move an existing on-premises infrastructure to the cloud should follow a careful planning process to ensure that they move in an efficient manner that doesn't disrupt business operations. Fortunately, organizations planning a move today can benefit from the lessons learned by those that have already made the move. Here are some best practices:

- **Virtualize the current environment first:** If an organizations' IT environment is currently running on nonvirtualized physical servers, it makes sense to first migrate to a virtualization platform. Many cloud vendors provide tools that allow direct importing of virtual machines into their Infrastructure as a Service (IaaS) offerings. Virtualizing on-premises systems is a valuable first step in a cloud migration.
- **Perform an application inventory:** Before an enterprise begins its move, it should have a solid understanding of the software running in its IT environment and all of its business applications. This inventory allows IT decision-makers to prioritize cloud migration activities in an orderly fashion.
- **Map application dependencies:** Modern applications often have multiple interfaces that create dependencies between systems. IT staff should have a solid understanding of these dependencies so that they may move related systems as a batch or ensure that the interfaces will work across the boundary between IaaS and on-premises systems.
- **Verify compatibility:** In most cases, organizations won't have any issues finding suitable IaaS platforms for existing applications, but IT managers should take the time to verify that a cloud provider can meet the hardware and operating system requirements of each business application.
- **Track performance metrics:** Moving to the cloud creates new demands on a network as users access applications over the Internet that were once located on-premises. If an organization separates its storage systems from application servers, it also may introduce network latency that didn't previously exist. IT staff should track the performance of critical systems before, during and after the move.

By following these best practices, IT managers can leverage the lessons learned by many organizations that have already adopted cloud computing strategies. They will smooth the transition to IaaS computing.

availability as well as disaster recovery capabilities and can deliver significant cost reductions in hardware procurement.

Businesses can scale their applications to any size with a fully automated self-service platform, and use any language, framework or tool to build applications. With Azure, companies pay only for the resources their applications use.

\$24 billion

The estimated global market for Infrastructure as a Service – the fastest-growing segment of cloud computing – by 2016.

SOURCE: Gartner, "Forecast Overview: Public Cloud Services, Worldwide, 2011–2016, 4Q12 Update," February 2013

Hybrid cloud computing models blend elements of public and private clouds. In this approach, the enterprise maintains both a public- and private-cloud presence and may shift workloads between clouds as needed to capture cost savings or handle bursts in demand.

Several major technology vendors offer hybrid cloud solutions. VMware's vCloud Air allows customers to simply and securely connect their internal private cloud to the public cloud offering of their choice. The solution also enables IT administrators to create a self-service catalog from which end users can request and provision their own IT resources in just a few clicks.

EMC's Enterprise Hybrid Cloud solution delivers flexibility to business IT operations. IT departments can seamlessly offer end users resources from both public and private clouds, while still maintaining control over the policies that govern those services. IT staff can also decide when and how to use public cloud resources, and which vendor provides those resources.

EMC Enterprise Hybrid Cloud and EMC VSPEX, a simple, efficient, flexible approach to deploying IT infrastructure, can serve as the foundation for a company's enterprise hybrid cloud. Companies can deploy VSPEX and the EMC Enterprise Hybrid Cloud solution together.

Cloud computing grew out of the concept of virtualization. Years ago, system engineers realized that running a single-function server on a dedicated piece of hardware often used resources inefficiently. The server must be designed to meet the application's peak demand, which may occur only rarely. Most of the time, much of the server's computing and memory resources went unused.

Virtualization allows multiple guest operating systems to run on a single piece of hardware and share the computing resources available on that hardware platform. When one guest server requires another processing core or more memory to support a burst in demand, the virtualization platform may simply assign it from an available pool and then reclaim it when no longer needed.

Cloud computing is the logical next step in virtualization, and it takes virtualization to a massive scale. Instead of sharing computing resources among a small number of guest servers, the cloud allows the sharing of resources across entire data centers and thousands of customers, in the case of public cloud computing. The

category of cloud services most directly related to virtualization is Infrastructure as a Service. With IaaS, providers offer basic computing services to their customers over the network.

The most common building blocks of IaaS computing models are server instances, storage systems, networks and databases. Engineers and developers building technology solutions in an IaaS environment may pick and choose from these components on an as-needed basis. In a public-cloud model, customers pay only for the computing resources that they consume by the hour or minute. They gain access to large-scale computing capacity without the major capital investments required to build and maintain a data center.

Cloud computing enables many of the emerging trends in IT by making available the computing resources they require. The rapid rise of mobile computing places significant demands on websites that support mobile users. Those sites often leverage the cloud to quickly scale to meet spikes in demand that arise from normal cyclical activity or unusual events. Mobile computing depends on the cloud.

Big Data analytics and the growing world of data science provide countless opportunities for knowledge discovery in retail, marketing, business operations and many other fields. Scientists working with Big Data require large-scale storage capacity and high-performance computing. As with mobile workloads, the cloud is uniquely situated to meet this demand quickly and cost effectively. When a Big Data experiment ends, researchers may simply turn off the provisioned resources, and costs immediately stop accruing. That flexibility simply doesn't exist in an on-premises computing model.

Why Is IaaS Needed?

Infrastructure as a Service allows organizations to leverage computing resources in an unprecedented fashion. The scale of cloud providers allows them to improve the technology and cost effectiveness of their services at a much more rapid rate than would be possible in a traditional computing model. When an organization makes capital investments in IT infrastructure, it must operate those infrastructure components for at least three to five years to recover the initial investment. Freeing companies from capital investments allows them to acquire the resources they need when they need them.

The cloud also enables a pay-as-you-go computing model. A weather forecasting company, for example, pays only for the servers it is actually using at any time, and when it turns off a server, the machine quickly becomes available for reuse by another customer of the cloud vendor. More important, the billing clock stops. This is especially important when it comes to the expensive high-performance computing resources used to compute the forecast model. Instead of purchasing supercomputers as a capital investment, the firm saves money by renting them by the hour for only those hours when they are needed to compute weather models.

To learn more about how a cloud provider can deliver the infrastructure that organizations need, check out CDW's infographic "IT Infrastructure Builders."

Cloud computing provides businesses with scalable and flexible computing capacity that can easily meet higher demand, even when that demand is unanticipated. When a major weather event occurs, many people in the affected region will access weather websites. If the weather firm used an on-premises computing model, it would need to purchase web servers capable of meeting that peak demand and then have them sit idle most of the year. This approach is clearly inefficient and requires the company to accurately predict future demand. Cloud customers avoid this need to overprovision because the computing resources available to them from large public clouds are, for practical purposes, unlimited.

When [TaylorMade Golf](#), a manufacturer of golf equipment based in Carlsbad, Calif., wanted to upgrade its disaster recovery capabilities, it deployed a cost-effective custom DR system with a public cloud provider.

The cloud solution allows the company to conduct inexpensive DR testing without disrupting ongoing replication and gives IT staff the ability to increase the IT resources it uses much more quickly than its previous DR system. By migrating to the cloud, TaylorMade also moved its spending for DR technologies from costly capital expenditures to more predictable operating expenses.

CHANGING ROLE OF I.T. STAFF WITH IAAS



The move to an IaaS environment directly affects the role of IT staff in an organization. Leaders planning the future role of cloud services in their environment should also spend time preparing their teams for the change. IT staff will be understandably anxious about job security, technical training and related issues and, if not addressed proactively, these can become disruptive influences in the workplace.

One of the biggest changes brought about by IaaS deployments is that staff will no longer work with physical computing assets. Instead, they shift to roles where they are managing technology assets without handling them directly. For the small portion of staff that managed data centers, this can create significant disruption. For most engineers, it simply requires a change in mindset as they become comfortable with the idea that they may no longer simply run over to the data center and check on "their boxes."

The role of IT managers also changes in the world of cloud computing. The most striking change is the increasing importance of vendor relationships. IT managers must cultivate and maintain relationships with the organization's IaaS service providers. Service level agreements increase in importance as enterprises depend upon the reliability, durability and availability of IaaS services.

While IT staff may initially focus on perceived drawbacks of cloud computing, the truth is that moving to IaaS frees both individuals and the broader IT organization of many mundane tasks. With this newfound time, they may shift their focus to strategic initiatives that deliver business value.

15 minutes

Time needed to deploy a new server using cloud services, versus as long as 90 days under a traditional IT architecture

SOURCE: HP, "Case Study: HP IT accelerates service delivery with hybrid cloud," December 2013

New companies or those developing new products or services also find great benefits from cloud computing models. The agility of cloud computing and its pay-as-you-go model enables the rapid development of new services and provides companies with a faster time to market. Instead of going through time-consuming and labor-intensive hardware procurement and installation processes, cloud customers can simply provision whatever computing resources they need with the click of a button. If the new product doesn't work out, a few more clicks deprovision the entire infrastructure and turn off the billing clock.

Cloud computing also enables companies to build highly available technology environments that are resilient in the face of disasters. The massive size of cloud environments requires the use of multiple data centers located near their geographically dispersed customers. Major vendors operate in many different regions and provide customers with the capability to shift resources between regions as needed. With a few clicks, customers may move a server from the Eastern United States to Western Europe. From a disaster recovery and business continuity perspective, this is a useful capability. If a hurricane looms on the East Coast, IT planners may proactively move their servers out of the storm's path and maintain operations unabated.

The disaster recovery and business continuity benefits of cloud computing are available even to companies that elect not to move their primary infrastructures to the public cloud. In fact, many businesses choose to use the cloud as a business continuity and disaster recovery option for on-premises data centers. With the cloud's pay-as-you-go model, firms may keep cloud costs to a minimum until disaster strikes, then activate their servers. This is much more cost-effective than maintaining a separate data center for business continuity purposes.

Perhaps the most valuable benefit of the cloud to businesses lies in its ability to provide immediate access to the computing resources needed to fuel growth. There's simply no reason that scaling the IT infrastructure should be a limiting factor in business expansion. The cloud allows IT staff to take advantage of scalable infrastructures that grow automatically as the needs of the business increase.

Selecting IaaS Solutions

The advent of IaaS has created new demands on IT managers and procurement specialists. Instead of analyzing hardware specifications, the individuals involved in selecting cloud service providers must instead have a deeper understanding of

functional requirements. This includes learning the varieties of IaaS, understanding the benefits that IaaS brings to the table and selecting the workloads best suited for cloud deployment.

Understanding the Varieties of IaaS

The four varieties of IaaS match the basic building blocks of any IT infrastructure: computing, storage, desktops and networks.

- **Computing as a Service** consists of server instances available for use in a cloud environment. These instances typically operate on hardware shared with other instances and customers. Vendors offer server instances in a wide variety of configurations, allowing IT professionals to match their purchases to business requirements for processing power and memory.
- **Storage as a Service** provides cloud-based storage options. This may come in the form of virtual disk volumes that administrators attach to virtual servers and access in the same manner as a physical disk volume. Storage as a Service options also include object stores — cloud storage options that simply store files for later retrieval without requiring a disk volume or file system structure.

HIGH-PROFILE IAAS VENDORS

While many vendors compete in the IaaS marketplace, several stand out from the competition because of the breadth and depth of their service offerings. These vendors account for a large proportion of enterprise IaaS spending:

- **Azure** is the IaaS offering from Microsoft. This platform is particularly appealing to organizations that use a Windows-centric computing model.
- **EMC Enterprise Hybrid Cloud** allows a company's IT department to act as a broker of cloud services, providing the control and visibility that IT organizations need, and the on-demand self-service that developers and application users expect.
- **HP Public Cloud** uses the OpenStack computing model to provide computing, storage, database, Domain Name System and content delivery services to customers.
- **VMware vCloud Air** provides IaaS services that appeal particularly to customers currently using VMware on-premises virtualization platforms.
- **Amazon Web Services (AWS)** is, by far, the largest IaaS service provider and offers a range of IaaS, Platform as a Service (PaaS) and Software as a Service (SaaS) designed to meet the needs of large and small customers.
- **Google Compute Engine** focuses on high-performance computing applications and seeks to differentiate itself from competitors on cost.

Each of these vendors provides a wide range of IaaS offerings using a variety of pricing models and savings constructs.

69%

Percentage of businesses that say they have saved money by moving to the cloud

SOURCE: Microsoft, "Small and midsize businesses cloud trust study: U.S. study results," June 2013

- **Desktop as a Service** provides virtual desktops to end users. The cloud vendor handles the provisioning, configuration and software installation for the desktop, relieving the local IT department of those mundane tasks. End users access the system through remote access technologies such as the Remote Desktop Protocol or the Personal Computer over Internet Protocol.
- **Networking as a Service** is the least mature of the IaaS product markets, with few vendors offering services. Those that do exist come in two forms: management services for network devices deployed on a customer's premises or cloud-based network services that augment an existing network infrastructure, such as a cloud-based VPN service.

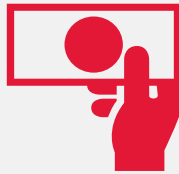
IT professionals may leverage each of these building blocks to assemble the components of a cloud strategy that makes sense for the unique needs of their organization. These services evolve quickly, so it is very important to keep abreast of developments in the cloud services market.

Why IaaS Is Attractive

Both IT professionals and procurement specialists understand the benefits that IaaS solutions bring to enterprise computing. From a financial perspective, companies may gain access to advanced technology without the capital cost outlays typically required for infrastructure initiatives. This alone often makes IaaS appealing to financial analysts who are focused on the bottom line. As they dig deeper, financial teams may find that IaaS services not only reduce capital expenditures but they may also reduce operational costs as well.

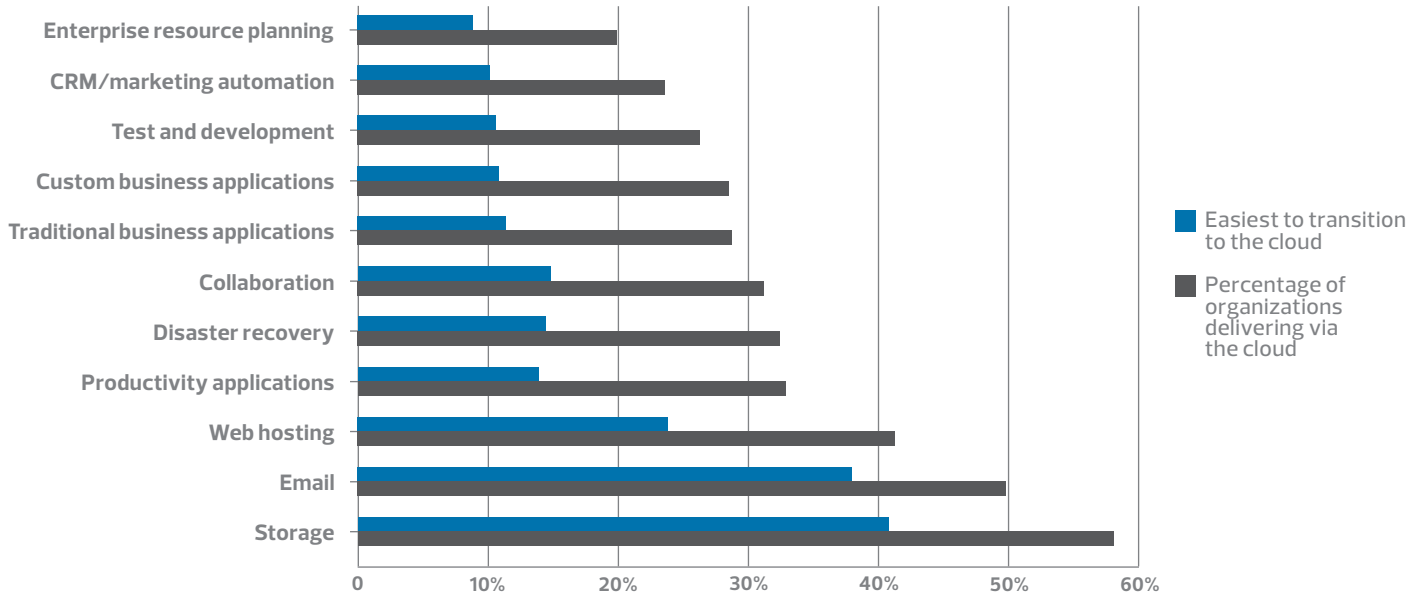
The financial benefits also come with an attractive story for the technical side of the house. IT teams are no longer burdened with legacy hardware because of the capital costs. Instead, the ability to provision resources on demand grants them rapid access to emerging technologies. When new technologies become available, IT teams may dip their toes in the water immediately by provisioning them through an IaaS provider.

Finally, IaaS deployments free IT organizations from many of the mundane maintenance-of-business tasks that sapped time in the past. Forget about waiting for hardware to arrive and performing racking and cabling tasks. Power management, cooling, backup generators and physical security all become distant memories as service providers assume responsibility for these functions.



ADOPTION THUS FAR

The most prevalent IT services in the cloud are also the easiest to transition – storage, email and web hosting



SOURCE: CDW, Cloud 401 Report, February 2015

IT teams may focus on building technology solutions that provide direct value to the business.

Selecting Applications Suitable for IaaS

Many applications benefit from deployment in IaaS environments, but IT professionals seeking to migrate workloads to the cloud should give priority to those that will realize the most benefit in the shortest period of time. This approach delivers maximum value to the business as quickly as possible. Some of the workloads particularly suited to cloud computing include:

- **High-performance computing (HPC)** workloads that require access to graphics processing units or other specialized computing assets that would be cost-prohibitive to deploy on-premises. This is particularly true when those HPC assets would sit idle for significant periods.
- **Business intelligence** and **Big Data analytics** tasks that require intermittent access to HPC and large amounts of storage. Some cloud vendors also offer specialized Platform as a Service (PaaS) offerings tailored to the needs of business intelligence and Big Data applications.
- **Test and development environments** supporting production systems. These workloads do not directly affect business operations, so they are low-risk candidates for the early stages of an IaaS migration project. They are also unused for long periods of time, making them particularly attractive candidates for the IaaS pay-as-you-go computing model.
- **Web applications** that require rapid scalability, business continuity and anytime, anywhere access. Cloud computing began with web application workloads, and they remain a

mainstay of IaaS environments. Many organizations begin an IaaS migration project by moving web applications first. These workloads are, of course, simply a starting point for the IaaS conversation. Organizations should conduct their own analysis of features and requirements to identify the workloads most suitable for cloud deployment.

How to Choose an IaaS Provider

The IaaS marketplace is crowded. The most recent Gartner Magic Quadrant for IaaS included 15 vendors significant enough to be considered players in the market, and new companies enter the cloud market regularly. How should an organization approach this cluttered market to select the providers that will best meet their needs?

The first question facing IT departments is how many IaaS partners is optimal. Most cloud professionals agree that the fewer partners in the mix, the easier it becomes to integrate solutions and manage relationships. Some feel, on the other hand, that it is dangerous to put all of an organization's IaaS eggs in a single basket and that pursuing a multipartner strategy mitigates the risks associated with the business or technical failure of a provider. The question usually boils down to whether an organization should select one or two partners. The answer depends on the risk tolerance and financial resources of the organization.

Choosing a cloud provider is a long-term strategic decision that organizations should carefully consider. While many IT professionals speak of developing a "vendor-agnostic" cloud solution that allows easy portability between vendors, the current technical reality is that this is not possible. Vendors provide different services with incompatible application programming

SECURITY, COMPLIANCE AND THE CLOUD



Many organizations preparing for moves to the cloud raise concerns about security and compliance issues. These are important issues that entities must take seriously. Any IaaS move should take place only when enterprise IT staff are satisfied that the cloud solution meets the organization's security and compliance requirements.

As security teams assess IaaS vendors, they often find that the vendor's security controls far surpass those available in on-premises solutions. In fact, many cloud vendors employ large security teams that are often more experienced and better-trained than the organization's own security staff. The economies of scale offered by cloud computing solutions apply to security as well — vendors leverage the benefit of massive resources to provide outstanding security services. After all, securing the infrastructure benefits both the cloud provider and its customers.

As an organization considers a cloud vendor, it should ask for evidence of security controls in place. While vendors may hesitate to provide the organization with physical access to facilities, they should have no concerns about describing the controls they have in place to protect computing assets. These should include an acceptable mix of administrative, technical and physical controls.

Companies that operate in a regulated industry or work with regulated data must also consider the compliance implications of moving to a cloud service provider. Compliance is usually not a barrier to leveraging IaaS services, but cloud customers must ensure that vendors meet the obligations of regulations such as the Payment Card Industry Data Security Standard. Most cloud vendors offer packages that describe the scope of their compliance activities, although they may require that potential customers sign a nondisclosure agreement before furnishing them.

interfaces, and shifting between vendors is a significant undertaking. Organizations should approach cloud provider selection as a three- to five-year commitment, even if the relationship carries no contractual obligations.

When selecting a cloud computing partner, IT teams must be comfortable that the provider operates a secure, reliable and scalable infrastructure. Cloud vendors should provide details of their business continuity programs and the depth of their infrastructure expertise. Most vendors hesitate to allow customers to visit their data center facilities for security reasons, but this does not absolve IT teams of their responsibility to perform due diligence.

One common way to bridge this divide is by asking the cloud vendor to provide the results of an independent data center audit performed by a well-known audit firm. These often come in the

form of Service Organization Control reports issued by a major audit firm. SOC reports provide customers with confidence that the vendor operates a secure, reliable infrastructure while calming vendor concerns about providing access to sensitive facilities.

Another differentiating factor among cloud service providers is the architectural assistance they provide to customers. Most providers offer customers access to solution architects (SAs) who have expertise in building solutions that leverage the provider's IaaS building blocks. Some provide SAs at no charge to the customer, while others treat SA access as a consulting service and charge by the hour. Customers should consider the availability, expertise and costs of SAs in the IaaS vendor selection process.

Each vendor offers a variety of computing services, requiring that IT organizations evaluate them against their unique technology needs. Here are some questions that organizations should ask as they consider the range of offerings from each cloud vendor:

- Does the vendor provide server instance types that align with our computing needs?
- Do the instances provided by the vendor provide cost-saving opportunities, such as burstable processing capacity?
- Are load-balancing and auto-scaling options available that match the organization's workload requirements?
- Do the vendor's offerings provide value higher up in the infrastructure stack through the availability of managed databases and similar services?
- Does the vendor have a consistent history of innovation and delivering new functionality in a timely manner?

The answers to these questions will help organizations through the vendor selection process as they work to partner with one or more cloud service providers.

IT decision-makers should remember, also, that IaaS is merely one component of an organization's cloud strategy. Selecting an IaaS partner is not a decision made in a bubble. IT shops should consider whether a potential vendor offers PaaS or Software as a Service (SaaS) solutions that also meet some of the organization's business requirements. If not, will the vendor's infrastructure allow for interoperability with the PaaS and SaaS solutions offered by other vendors? Application development is one of the areas where this becomes most critical. What platforms do the organization's application developers prefer? Does the vendor offer PaaS solutions that align with those preferences?

Finally, as organizations make the transition to IaaS environments, they often require assistance in identifying and selecting the services best suited for their computing needs. Do the vendors under consideration provide a consultative approach to cloud computing? Do the organization's IT managers wish to conduct this assessment themselves or bring in third-party consulting assistance to help plan the move to IaaS? Bringing in an outside consultant can help organizations approach the cloud in an objective manner, freeing them of the burdens of legacy thinking.

CDW: A Cloud Partner That Gets IT

CDW's solution providers serve as your organization's Infrastructure as a Service partner. The CDW team will help you get to the cloud, integrate your solution seamlessly and, if you desire, completely manage your day-to-day operations. CDW accomplishes this all while putting plans in place to enhance your security and mitigate identified risks. CDW provides the risk management methodologies that you need to secure data, maximize continuity of operations and put disaster recovery plans in place.

CDW's Cloud Client Executives, account managers, solution architects and advanced technology engineers stand ready to assist you in every phase of your project as you select and implement the cloud technology needed to boost productivity, regulate IT costs, enhance flexibility and drive innovation. CDW will help you get started with a risk assessment that reveals vulnerabilities prioritized by risk, cost and impact.

CDW takes a comprehensive approach to identifying and meeting the needs of every customer. Each engagement includes five

phases designed to help you achieve your security objectives in an efficient, effective manner. These phases include:

- An initial discovery session to understand your goals, requirements and budget
- An assessment review of your existing environment and definition of project requirements
- Detailed vendor evaluations, recommendations, future environment design and proof of concept
- Procurement, configuration and deployment of the final solution
- 24/7 telephone support and ongoing product lifecycle support

To learn more about how CDW's cloud computing solutions can help you deliver the perfect mix of flexibility, scalability and innovation, contact your CDW account manager, call 800.800.4239 or visit cdw.com/cloud.



HP Helion Public Cloud is a transparent, enterprise-grade public cloud based on OpenStack® technology. It offers on-demand, pay-as-you-go cloud services for computing and storage infrastructure as well as platform services. And with its robust ecosystem of partner solutions for storage, platform, management, orchestration and more, the sky's the limit to what you can do in the cloud. Combine onsite IT with private and public cloud elements to create an environment that's right for your business. Our hybrid delivery model brings choice, confidence, and consistency to the enterprise cloud experience.

CDW.com/hp



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Microsoft® Office 365 for large and small organizations is a subscription service that combines the familiar Microsoft Office Apps with a set of web-enabled tools that are easy to learn and use. They work with existing hardware, and come backed by the robust security, reliability and control you need to run your organization.

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