

I D C E X E C U T I V E B R I E F

Is Cloud Computing Right for You?

August 2010

Adapted from *Telcos in the Cloud: Claiming a Seat at the Table* by Melanie Posey,
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Introduction: The Evolution of IT Sourcing Models

Business processes and functions are increasingly IT dependent and network based, and enterprises require agile IT infrastructure sourcing approaches to meet rapidly changing business objectives. Over the years, service providers have responded to this need with ever-evolving offering portfolios and service delivery models that address the age-old question of "build versus buy" — service bureaus for mainframes, IT outsourcing, datacenter colocation, and managed hosting, to name a few.

Key technology innovations such as virtualization and datacenter automation have spurred the development of new, more flexible ways of managing and consuming IT resources. Cloud-based sourcing represents the next stage in the continuing evolution of IT service delivery. Cloud-based models deliver business and technology benefits across a range of IT domains: infrastructure, business applications, and development platforms. This Executive Brief examines the cloud-based approach to IT infrastructure (infrastructure as a service) and explores how enterprises can leverage this model to enable dynamic infrastructure that flexibly supports key business needs.

Defining Cloud Computing and Infrastructure on Demand

Cloud computing is an emerging deployment and procurement model that facilitates real-time delivery and consumption of cloud-based IT infrastructure, networking, and application services over the Internet and/or private IP networks. Cloud computing architectures leverage virtualization, service automation and orchestration, and multitenancy to create unified, scalable pools of hardware, software, and network resources to enable dynamic, on-demand delivery of IT and application functionality. Cloud computing business models offer end users various degrees of flexibility with regard to service consumption, pricing, and self-service provisioning and management.

The cloud services model can be applied to capabilities in the following three domains:

- Servers, storage, and networking or infrastructure as a service (IaaS)
- Business application functionality or software as a service (SaaS)
- Application development environments or platform as a service (PaaS)

Infrastructure as a service is the foundational component of the cloud computing service model. Server virtualization — the ability to run multiple OS/application stack images on a single physical hardware platform — underpins the IaaS value proposition. Hypervisors perform the function of dividing the resources of physical servers into logical resources or "virtual machines" that operate as isolated computing environments and can be moved or copied across different physical servers as needed. Server virtualization helps to limit hardware sprawl by consolidating applications on fewer physical devices, thus boosting utilization of the remaining server resources, freeing up datacenter space, and reducing power and operations costs. Automation and orchestration technology overlaid on top of the virtualized infrastructure provides the service delivery mechanism for rapid provisioning and scaling of IT environments and maintenance of the core cloud infrastructure.

Enterprises can handle their IT operations in-house or source some or all of these capabilities from third-party service providers. The IaaS approach to IT is an evolution of market-tested managed hosting and datacenter colocation solutions that package access to facilities, hardware/software, networking technology, and support as remotely delivered, off-premises services. The innovation of IaaS is the customer's ability to manage, configure, and scale the infrastructure on a self-service basis. All forms of IaaS are multitenant (i.e., shared infrastructure) solutions. However, "private" cloud platforms are dedicated to a single customer and shared among different internal business units, while "public" clouds use aggregated platforms that are shared across the service providers' base of unrelated customers. IaaS solutions (both public and private) can be either "bare-metal" application containers or integrated virtual private datacenter resources.

IaaS: Multidimensional Benefits

Infrastructure-oriented cloud computing yields a range of business and technology benefits. On the business front, the most obvious advantage of the cloud services approach is financial. Like other externally provided services such as managed hosting, the "buy versus build" aspect of IaaS allows enterprises to source the resources to support new IT projects without the need for additional capital expenditure. The "service" part of IaaS means that enterprises can simply purchase access to a fully managed IT

infrastructure stack on an as-needed, scalable basis that is in line with changing enterprise computing requirements and in a manner that more tightly aligns utilization with operational cost.

Increased business agility is another benefit of IaaS. As business processes such as sales, customer service, product development, and internal communications/collaboration become ever more IT and network dependent, enterprises need more dynamic IT infrastructures to respond to new business opportunities. IaaS also helps to simplify IT operations by enabling consistent IT implementation across all corporate locations and ensuring continuity of operations. Finally, IaaS' ability to speed up time to market (and time to revenue) means that internal IT staff can spend more time executing on core business priorities and less time on infrastructure procurement and deployment.

On the technology front, the key benefits of IaaS are rapid deployment capabilities and elasticity/scalability. IaaS adoption frees IT staff to concentrate on strategic business-enabling projects instead of undifferentiated hardware provisioning tasks. Elimination of lengthy IT procurement and implementation cycles, as well as on-demand access to IT resources, means that the time needed for enterprise application development and deployment can be measured in days or weeks rather than months. In addition, IaaS solutions allow IT users to configure resources precisely tailored to specific computing tasks, with the ability to scale up or down as needed. Furthermore, IT departments, no longer constrained by limited (or lacking) infrastructure resources, have more scope to innovate on revenue-generating and/or cost-saving IT projects.

IaaS also serves broader enterprise IT objectives related to datacenter consolidation and centralization of IT systems. By providing a common, adaptive resource platform, IaaS can replace existing heterogeneous (and often underutilized) server and storage silos with a standardized infrastructure stack for building, running, and scaling internal, B2B, and B2C applications. When these unified IaaS resources are also connected to the enterprise network via VPN tunneling technologies or site-to-site MPLS, companies can leverage the cloud as an extension of internal IT resources or as an on-net (but offsite) disaster recovery/business continuity solution.

Use cases that demonstrate the benefits of IaaS include the following:

- **Short-term or seasonal computing requirements.** IaaS eliminates the need to deploy resources for peak loads, avoiding stranded investment in underutilized resources.
- **Unexpected, unpredictable peak loads.** IaaS provides dynamic burst capacity for applications with variable/spiky demand for compute resources, such as public Web sites where increased traffic is often triggered by external, unforeseen events.

- **New application "road testing."** Not all new applications or Web-based business models pan out. IaaS provides a low-risk, capex-lite platform for innovation at all stages of the life cycle: proof of concept, development, testing, staging, and scale production.
- **Rapidly expanding storage requirements.** Rich media Web sites, Internet video, and ever-expanding volumes of business data require storage that is not only scalable but also accessible anytime and anywhere.
- **Datacenter capacity constraints.** Following a datacenter consolidation, certain workloads (particularly, non-mission-critical tasks) may need to be migrated offsite.
- **Business continuity/disaster recovery.** IaaS can be used to provision lower-cost, more easily manageable high-availability application environments.

Is IaaS the Right Sourcing Model for Your Business?

Pulling the trigger on adopting the IaaS sourcing model depends on businesses' comfort with the idea of third-party service provision in general. Naturally, new service delivery models take time to gain acceptance, and there are often technological and organizational inhibitors to adoption, including security, availability of in-house IT staff, performance, security, flexibility, and cost.

Some of these concerns can be addressed through careful assessment of providers' IaaS service functionality. For example, self-service portals and APIs allow IT staff to make moves/adds/changes in real time. Private VPN connectivity options offer additional security and improved performance of applications running on cloud-resident infrastructure. Finally, some service providers' IaaS solutions are positioned as virtual private datacenters that support federated, reserved compute/storage environments; policy-based firewalls; and load balancing within and across the providers' facilities.

The next set of decisions then takes place at the individual application level. All types of companies — enterprises, SMBs, and "cloud-native" start-ups — can leverage IaaS for some aspect of their IT infrastructures. However, the cloud sourcing model may not be appropriate for every application or business process. Technical attributes such as I/O requirements, process interdependency, depreciation/amortization schedules, security (compliance, customer data protection), and sensitivity to network latency must be considered on a case-by-case basis to determine the "cloud readiness" of any particular application.

When exploring IaaS options, businesses need to consider the type of service provider they want to work with. Some cloud providers serve the individual developer community and consumers with standalone, cloud-specific offerings, while other providers focus on

business organizations' overall IT/networking needs with comprehensive service portfolios. Closely related to the type of IaaS provider is the issue of the type of IaaS service being offered. "Pure cloud" provider offerings may suffice for businesses whose highly skilled systems administrators and developers just need bare-metal virtual compute and storage for project-based needs.

However, organizations that require "business-class" cloud-based infrastructure with capabilities such as private networking, on-net redundancy, and integrated compute environments may need a "hybrid" provider with expertise in public and private cloud deployments, end-to-end service management (from the customer site to the service provider datacenter), and security (at the network and datacenter level).

Service provider due diligence should involve evaluation of providers' platform testing, upgrade, maintenance, and troubleshooting processes, as well as government and industry compliance certifications for providers' cloud platforms, processes, and facilities. Other key considerations include the service provider's longevity/experience in the datacenter/IT management space, datacenter footprint and available network connectivity, and partnering strategies for additional cloud-sourced middleware and business application functionality.

Conclusions and Recommendations

Cloud computing services are not an all-or-nothing proposition. At the end of the day, IaaS provides enterprises with simplified, performance-oriented IT infrastructure solutions with enhanced scalability and self-service/on-demand features.

Cloud computing is about evolution, not revolution. IaaS solutions represent an aggregation of technological innovations implemented as an economically efficient, scale-oriented service delivery model. In many cases, IaaS complements rather than replaces traditional managed hosting and colocation services or in-house IT management. While the new model provides "pay-as-you-go" scalability and flexibility in certain use case scenarios, some applications or use cases have fixed, predictable resource/usage requirements that are better served by traditional hosting. Service providers whose IaaS solutions incorporate performance management features, private networking options, and platform-embedded security can help businesses with lingering concerns about shared-tenant, offsite resources reap the benefits of "cloud sourcing" in ways that position IaaS as more than just servers and storage "out there" in the cloud.

Ultimately, application requirements and business objectives should dictate enterprises' service delivery model choices — not vendor and/or market hype. IaaS is the next evolution of managed hosting, providing dynamic sourcing elements that accommodate variable demand at variable cost. Businesses need to take a life-cycle approach to their IT-related "build versus buy" decisions for IaaS and

traditional services, taking into account whether they have the budget, personnel, and technological expertise to manage IT infrastructure requirements today and if those internal resources are flexible and scalable enough to handle tomorrow's requirements.

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