White Paper

The Cloud Value Chain Exposed

Key Takeaways for Network Service Providers

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By Wouter Belmans and Uwe Lambrette

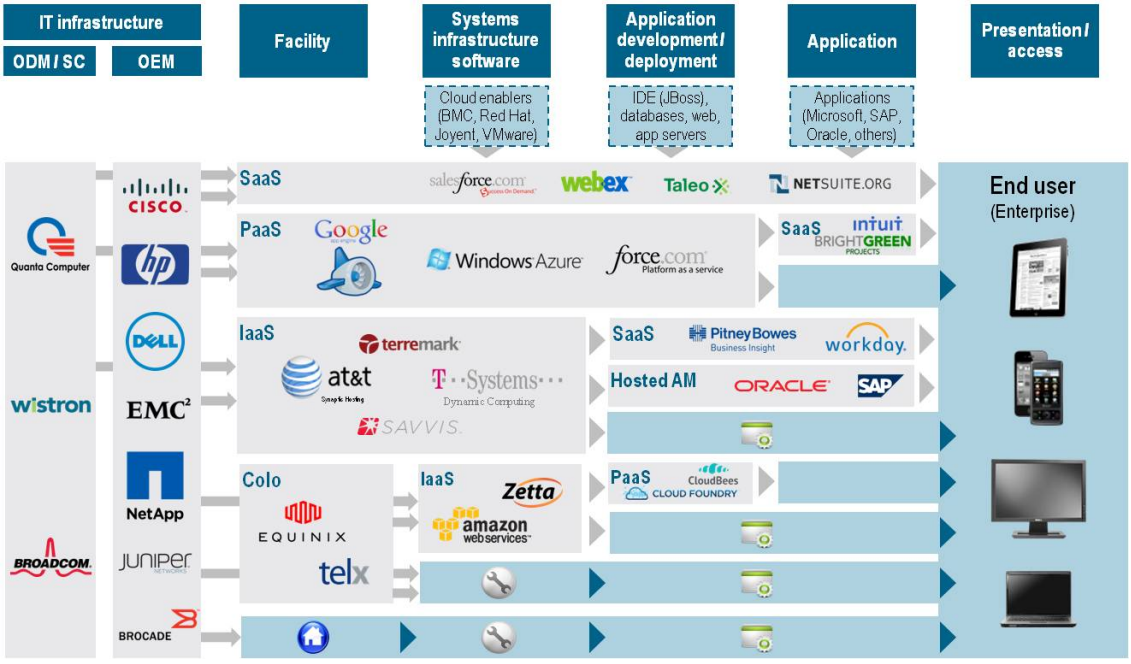
Introduction

As cloud computing matures and hype becomes reality, uptake among small and medium-sized businesses (SMBs) and large enterprises is increasing. And although the cloud is still in its infancy, the Cisco® Internet Business Solutions Group (IBSG) believes it is an appropriate time to ask: "How is the cloud value chain taking shape, and where are the battlefields I need to be concerned about?"

In addition to looking at cloud computing through the lens of the IPS stack (IaaS, PaaS, SaaS),[1] Cisco IBSG analyzes the wide range of roles cloud providers play in the end-to-end cloud value chain. Figure 1 shows how PaaS providers, for instance, can deliver services to end users and SaaS providers alike. The diagram also illustrates how PaaS providers can either be customers of IaaS providers or run their own IT infrastructures.

Taking this complexity into account helps generate more insights about the role of cloud computing in the IT value chain. It also allows participants to better understand the necessary fine-tuning of value propositions that meet the needs of partners in the chain. For example, the value proposition of an IaaS player offering SaaS enablement is different from that of an IaaS player that serves enterprises directly.

Figure 1. The Cloud Computing Value Chain.



Source: Cisco IBSG, 2012. Note: This diagram represents a qualitative view of the cloud delivery chain. Some categories, companies, and delivery models have been omitted for simplicity.

Note to readers: Each section of the paper, as outlined in the Executive Summary, begins with a diagram of the cloud value chain (shown at the top of Figure 1). The dark blue boxes indicate the section or sections of the cloud value chain being discussed.

Executive Summary: Disruptions on Six Battlefields

By analyzing various activities across the IT value chain, Cisco IBSG has found that the cloud is disrupting activities from the application and presentation layers, all the way to the facility and IT infrastructure layers. To help network service providers (NSPs) navigate this rapidly shifting landscape, this paper discusses the major disruptions taking place on six battlefields across the value chain. In the last section, we discuss the specific takeaways for NSPs.

1. SaaS Will Further Disrupt the Independent Software Vendor (ISV) Landscape

- Barriers to new entrants continue to decrease due to IaaS, PaaS, and cloud brokers.
- ISV incumbents are slowed down by cannibalization.
- The SaaS paradigm is already disruptive in approximately 25 percent of the software market.
- Mobile application access is accelerating SaaS adoption in additional software segments.

2. PaaS: Development Platforms Will Be at the Core of the Cloud

- The advantages of automation are increasing, while the drawbacks of lock-in are being addressed.
- PaaS is winning the hearts of web developers, with enterprise development close behind.
- In just five years, PaaS could be the cloud delivery model that generates the most revenues for cloud service providers.

3. IaaS: Web-Grade and Enterprise-Grade Infrastructure Services Continue To Battle Each Other

- The battle of web- versus enterprise-grade services rages on across hosted and internal IaaS.
- Maturing web-grade cloud enablers will accelerate the entry of more than 30,000 hosting companies.
- Despite the head start of web-grade services, Cisco IBSG expects strong growth for enterprise-grade IaaS.
- The battle of data center (DC) architectures will continue with massively scalable DCs (web) versus vertically integrated DCs (enterprise) co-existing for the foreseeable future.

4. Facility and Infrastructure Strategies Are Often-Forgotten Fundamentals

- Two facility strategies are on the rise, and often compete with each other:
  1. On-net cloud delivers the value of WAN / IT integration.
  2. Mega-exchanges deliver the value of an ecosystem of players that host services together.

- Cloud computing enhances IT infrastructure buying power and sophistication. This means ICT infrastructure original equipment manufacturers (OEMs) must rapidly innovate to avoid commoditization.

5. Commercial Activity Channels Are Being Disrupted by Cloud Brokers

- Everybody wants to be a cloud broker, but only a few companies will attract the required ecosystem to succeed.
- Players that can grow from the core will be more successful in the cloud market.

6. Professional Services Require a Shift to Activities that Add More Business Value

- In the short term, cloud migration services are the main opportunity.
- Longer term, professional services companies must shift their focus to activities that add more business value.
- As the focus shifts to business value, deep industry expertise will become increasingly important.

NSPs must be aware of these value-chain dynamics when determining their go-to-market strategies, which include:

- Commodity infrastructure services with PaaS support
- Enterprise-grade infrastructure services with developer enablement
- Telco-centric SaaS, including communications, collaboration, and security
- Vertical business process services, with a platform ready for business process as a service
- Network as a service (enriched network to better support the cloud)
- Cloud aggregation and brokerage linked to telco-centric managed services

SaaS Will Further Disrupt the ISV Landscape

SaaS is the early winner in the cloud space, generating the largest revenue of the three cloud models. In fact, Cisco IBSG estimates that global spending on SaaS will reach $30 billion by 2013.[2] Indeed, SaaS has quickly become more important than the traditional application service provider (ASP) approach.

A battle to capture the SaaS market is taking place between new entrants and ISV incumbents who were forced to rework many of their licensed applications to run on a SaaS platform (see Figure 2). Because they face the issue of cannibalizing revenues from their own software licenses and support, incumbents are often slow to market. New entrants, on the other hand, are emboldened by the presence of business enablers that drastically lower their barriers to entry.

- Developments in the lower layers of the cloud stack (IaaS / PaaS) enable newcomers to quickly build applications without spending capital on infrastructure.

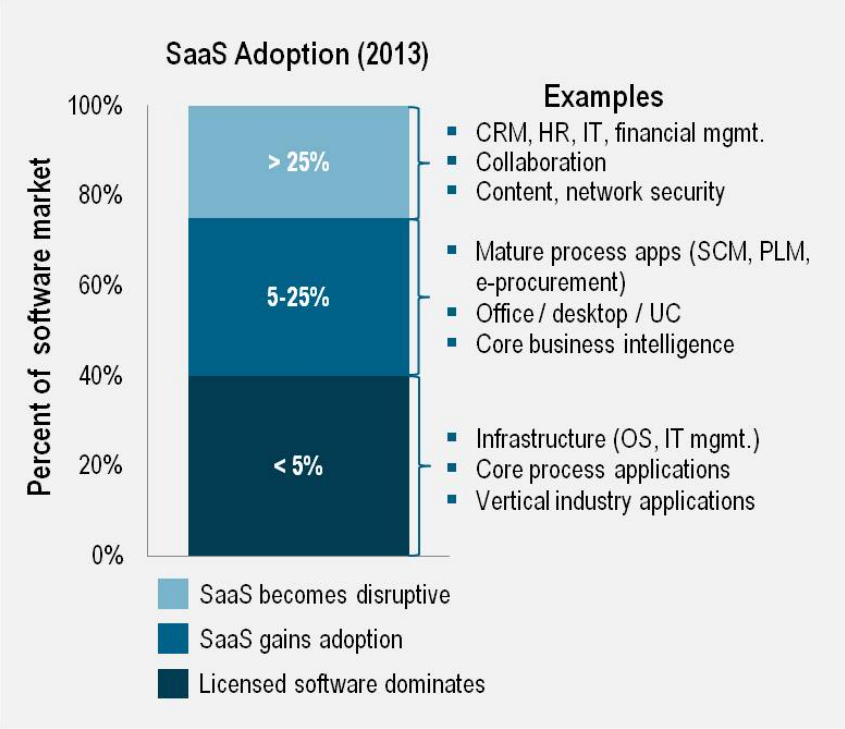
- Various cloud broker and marketplace models are emerging that will disrupt sales channels and ease the work of bringing new applications to market. (See below for more details.)

Figure 2. The Battle Between New Market Entrants and Incumbent ISVs.

Source: Cisco IBSG, 2012

Forrester Research estimates that SaaS is already disrupting about 25 percent of the enterprise application space (see Figure 3). This change is mainly occurring in application areas that are regarded as the "usual suspects" in the SaaS marketplace—commodity applications (e.g., CRM, human resources, and finance) and new application categories that function better outside the firewall (e.g., collaboration). Most of these SaaS-prone areas are not dependent on a specific vertical industry, a fact that has accelerated market development and adoption.

Figure 3. SaaS Is Disrupting 25 Percent of the Software Market.

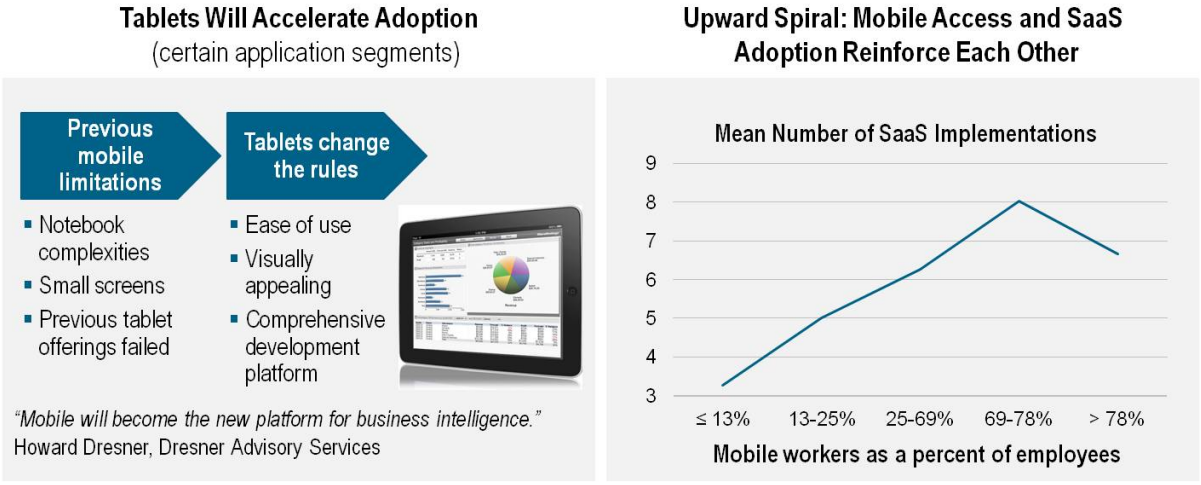


Sources: "Which Software Markets Will SaaS Disrupt?" Forrester Research, January 2011; Cisco IBSG, 2012

SaaS also benefits from other IT industry trends. Specifically, the "second wave of IT consumerization" will accelerate the penetration of SaaS into additional software segments. In their personal lives, employees use mobile applications for a growing number of tasks. In their work lives, they expect similar access to business applications from their mobile

devices. Additionally, the stellar adoption of tablets, which brings mobility to a larger screen, is accelerating this trend (see Figure 4).

Figure 4. Mobile Access Is Further Accelerating SaaS Adoption.



Sources: OCO Business Analytics, 2011 (left); Schireson, 2010 (right)

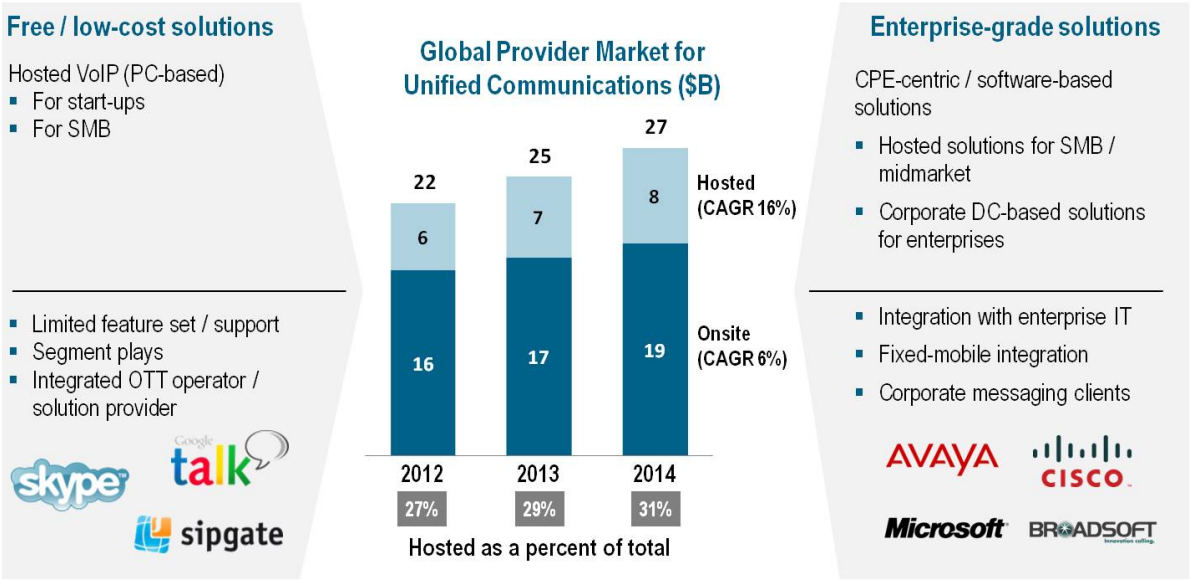
Delivering business applications to multiple devices is one of the key challenges facing CIOs today. The development work required to run client applications on multiple mobile platforms is time consuming and often done poorly. SaaS simplifies this work of adapting enterprise applications for mobility. Many SaaS applications already come with client apps that run on a diverse set of mobile devices. In addition, the emergence of HTML5 will further ease access to SaaS applications: HTML5 is expected to reduce the cost of developing client applications for different mobile platforms and form factors.

> "When we assess new SaaS applications, our first and most important consideration is mobility. My end users demand application access from the mobile devices they want to use that make them most productive."
>
> CTO
> Large car manufacturer

One of the next markets to be disrupted by SaaS, and strongly accelerated by mobile access, is unified communications. In this space, we see fast adoption of hosted solutions, as well as an example of a theme that's recurring across the cloud value chain: the battle between providers of commodity tools and providers of enterprise-grade solutions (see Figure 5).

Hosted unified communications are attractive because they offer productivity benefits and a reduction in total cost of ownership (TCO) since management and configuration tasks are simplified.[3] A previous Cisco IBSG research paper estimated that unified communications would make up a significant part (greater than 20 percent) of the SaaS market.[4]

Figure 5. Commodity- Versus Enterprise-Grade in Unified Communications.



Sources: Forrester Research, 2009; Business Insights, 2008; IDC, 2009; McKinsey, 2011-2014

Adoption of unified communications is often associated with the changing role of desktop applications. From Cisco IBSG's previous research, we know that running desktop applications in the cloud can be attractive because it reduces complexity and increases security. Typically, a subset of employees who are very task oriented (e.g., call center workers) is migrated first. There are two distinct approaches to running desktop applications in the cloud:

1. **Virtual desktop instances (VDI):** This is the IaaS approach, in which a provider offers a desktop OS to end users. As on any desktop, the end user runs applications on the VDI.
2. **SaaS desktop applications:** The end user accesses large-scale desktop applications (e.g., Google Apps) from a browser or thin client, completely bypassing the task of desktop management.

Both types of deployments are gaining momentum and will play a significant role in the enterprise space for the foreseeable future.

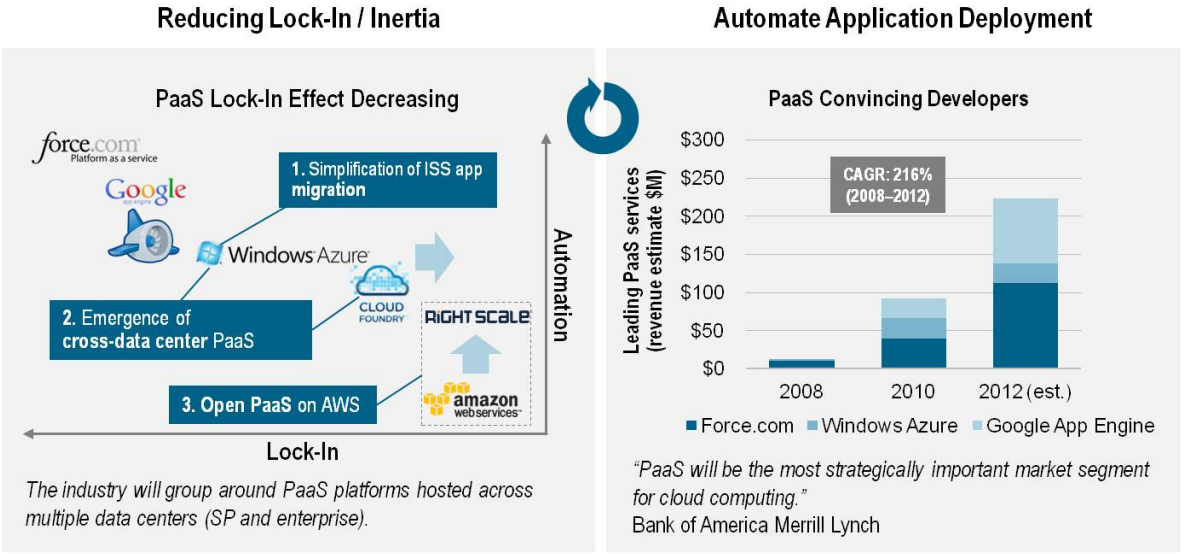
Development Platforms at the Core of the Cloud

The idea of on-demand development and runtime environments has been around for some time. Developers have been key decision makers in the journey to cloud computing from the beginning. But until now, PaaS has been the "little brother" in the IPS stack, with limited adoption and revenue generation.

The advantage of PaaS (as opposed to using a licensed Integrated Development Environment is clear—the automation of activities like scaling, resource allocation, data management, and failover make it easier and quicker to develop and deploy quality applications (see Figure 6). The main reason for the slow adoption of PaaS has been the drawback of lock-in—being tied to a single architecture. Applications need to be developed or replatformed specifically for each PaaS platform.

Over the past year, Cisco IBSG has seen several trends that point to the increasing importance of on-demand development platforms. PaaS is becoming more accepted by application developers, as evidenced by the fast growth of the main PaaS platforms—Windows Azure, Google App Engine, and Force.com. Moreover, Cisco IBSG has observed significant investment activity in PaaS startups. In 2011 alone, CloudBees secured $10.5 million, Standing Cloud raised $3 million, DotCloud netted $10 million, and AppFog generated $8 million in funding.

Figure 6. Reinforcing Dynamics: Advantages of Automation Increasing and Lock-In Effect Decreasing.



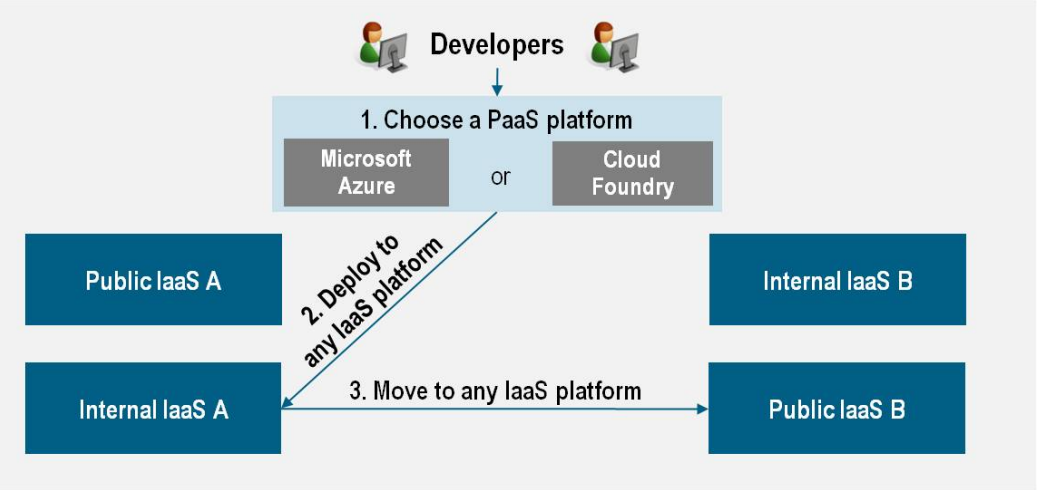
Sources: Tiobe; Merrill Lynch; Cisco IBSG, 2012

A key driver behind the heightened interest in PaaS is the diminishing concern about lock-in due to several recent developments:

1. Microsoft updated its Windows Azure software development kit (SDK) to simplify Internet Information Services (IIS) application migration.
2. Previously, large PaaS solutions were hosted by the PaaS providers themselves. Now, leading PaaS platforms can be run across multiple hosted and internal DCs (see Figure 7).
    - Fujitsu offers Microsoft Azure across public and private clouds.
    - VMware launched Cloud Foundry, an open-source solution that can run in any DC.

3. The open-PaaS paradigm of RightScale automates many development functions across different IaaS platforms, but keeps all configurations and transactions transparent to users. This yields many of the benefits of PaaS, without the risk of lock-in.

Figure 7. PaaS Platforms Running Across Multiple DCs.



Source: Cisco IBSG, 2012

Obviously, the early success of PaaS has been due to interest from the web development community. The big question yet to be answered is: Will internal enterprise developers be as eager as web developers to adopt the PaaS paradigm? When addressing this question, it is important to keep the activities of enterprise developers in mind—only 10 to 20 percent of activity is for new application development. This implies the uptake of PaaS—which primarily takes place in new application development—will be slower in the enterprise.

"There's nothing going on with PaaS in our developer community today. We plan to use PaaS opportunistically for campaigns and customer-facing applications."

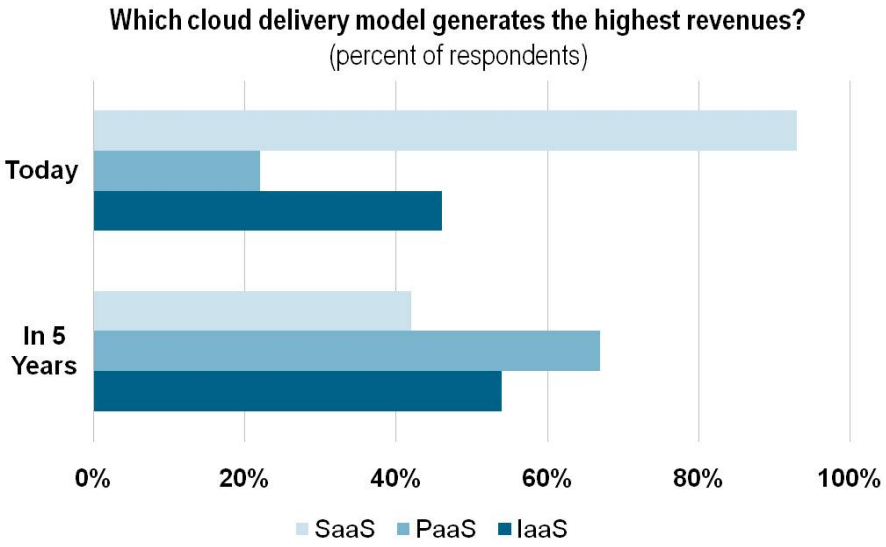
CTO of IT Services
Large car manufacturer

One of the events that could accelerate adoption of PaaS by enterprise developers will be the availability of key enterprise application servers in the cloud. Oracle has taken a first step in this area by launching its cloud-themed application server, WebLogic 12c. On these types of platforms, the changes that enterprise developers need to make to move to PaaS become significantly smaller than before.

"Enterprise developers at our company all program in Java. They are currently using IaaS, but experimenting with Java-based PaaS platforms like Red Hat's OpenShift."

Head of Cloud Services
Large systems integrator in Asia

Figure 8. PaaS Will Become a Major Cloud Revenue Generator.



Source: "Leaders in the Cloud: The Changing Tide," Sand Hill Group, 2011

Most research about cloud computing has hinted at the limited potential for PaaS revenues. But a recent survey from the Sand Hill Group, in which the consulting firm interviewed software executives about cloud computing, indicates a shift is imminent (see Figure 8). In fact, Sand Hill Group predicts that PaaS will generate more revenues than any other cloud delivery mechanism within five years.

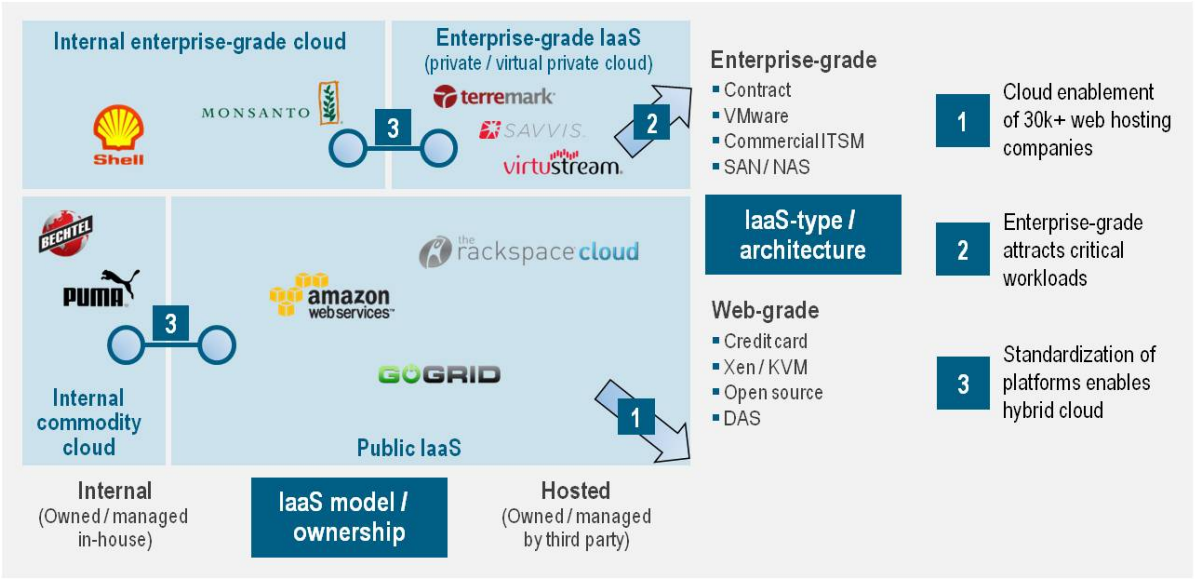
IaaS: The Battle Over Web- Versus Enterprise-Grade Solutions

The distinction between web- and enterprise-grade infrastructure platforms is somewhat arbitrary, but relevant nonetheless (see Figure 9). Generally, web-grade platforms deliver services that can be purchased with a credit card, use open-source tools for hypervisors (Xen, KVM) and full cloud automation, and offer low-end, direct-attached (often distributed) storage.

On the other hand, enterprise-grade platforms are used in environments where customers sign contracts, use enterprise software for hypervisors (VMware) and cloud automation

(commercial ITSM), and incorporate high-end storage like storage-area networks (SANs) or network-attached storage (NAS). Typically, enterprise-grade platforms are more rigorous about security certifications and offer better and more reliable service-level agreements (SLAs) while charging a premium. More sophisticated concepts for IaaS, like virtual DCs, were pioneered by enterprise players, but are increasingly being implemented by web-grade cloud providers as well.

Figure 9. The Battle Between Web- and Enterprise-Grade Platforms Rages Across External and Internal IaaS.



Sources: IDC, 2011; Tier 1, 2011; Cisco IBSG, 2012

For hosted (external) IaaS solutions, web-grade platforms have clearly taken an early lead. With regard to internal IaaS solutions, enterprises have mainly chosen enterprise-grade platforms. Our expectation is that infrastructure services are on a fast-growth trajectory. A couple of key dynamics are underpinning this growth:

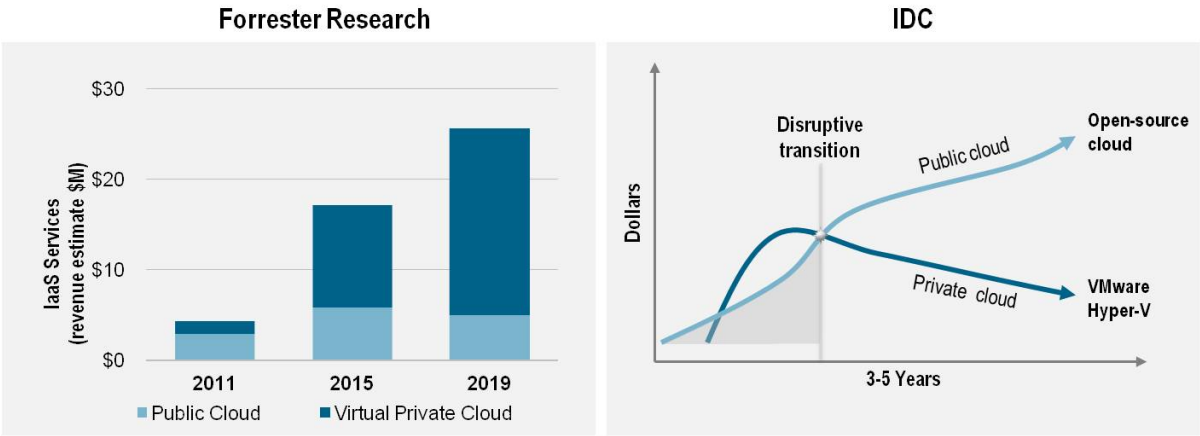
1. **Maturing IaaS-enabling platforms accelerate entry of more than 30,000 hosting companies**
   The web hosting space is fragmented, with a plethora of small companies taking a large share of the market. Although cloud first took hold in web-based environments, the majority of web hosting companies have not yet been cloud-enabled. Tier 1, a research firm, estimates that 30,000 web hosting companies still do not use cloud-based technologies.[5] Cisco IBSG expects an additional push toward public IaaS because its enablement stacks are quickly maturing.

   - Led by OpenStack, open-source standards have gained momentum.
   - Recent acquisitions like those by Dimension Data (acquired OpSource) and Citrix (bought Cloud.com) are also driving standards.[6]
   - Cloud-enablement start-ups have raised significant funding (Joyent: $85 million; Nimbula: $21 million; Eucalyptus: $26 million).[7]

2. **The enterprise-grade cloud will attract increasingly critical workloads**
   A double dynamic is taking place in the cloud industry: (1) enterprises are putting

increasingly critical workloads in the cloud; and (2) web-grade platforms are rapidly gaining in reliability and performance. Given this, the role of enterprise-grade cloud solutions will depend on whether businesses perceive value in the long term. The research community is divided on the topic (see Figure 10).

Figure 10. Research Community Divided on Role of Enterprise-Grade Cloud Computing.



Sources: IDC, 2011; Forrester Research, 2011

Cisco IBSG strongly believes that enterprise-grade clouds will continue to attract critical workloads. Not only do we see solid demand for enterprise-grade IaaS services, we also observed significant investments in this space.

- Cisco acquired Tidal Software, newScale, and LineSider, leading to the CloudVerse announcement in December 2011.[8]
- Telcos are also accelerating their entry into the cloud market through acquisitions. For example, Verizon acquired Terremark, CenturyLink bought Savvis, and Dimension Data acquired OpSource.[9]
- Virtustream, an enterprise IaaS provider, raised $10 million in 2011. Tier 3, a cloud platform for enterprises, raised $8.5 million in funding in 2011.[10]

Obviously, enterprises do not believe that web-grade clouds will deliver what they need, or that public networks will give them the required high-level SLA guarantees. Given this, they are turning to enterprise-grade clouds instead.

3. **Standardization of IaaS platforms will enable the hybrid cloud**

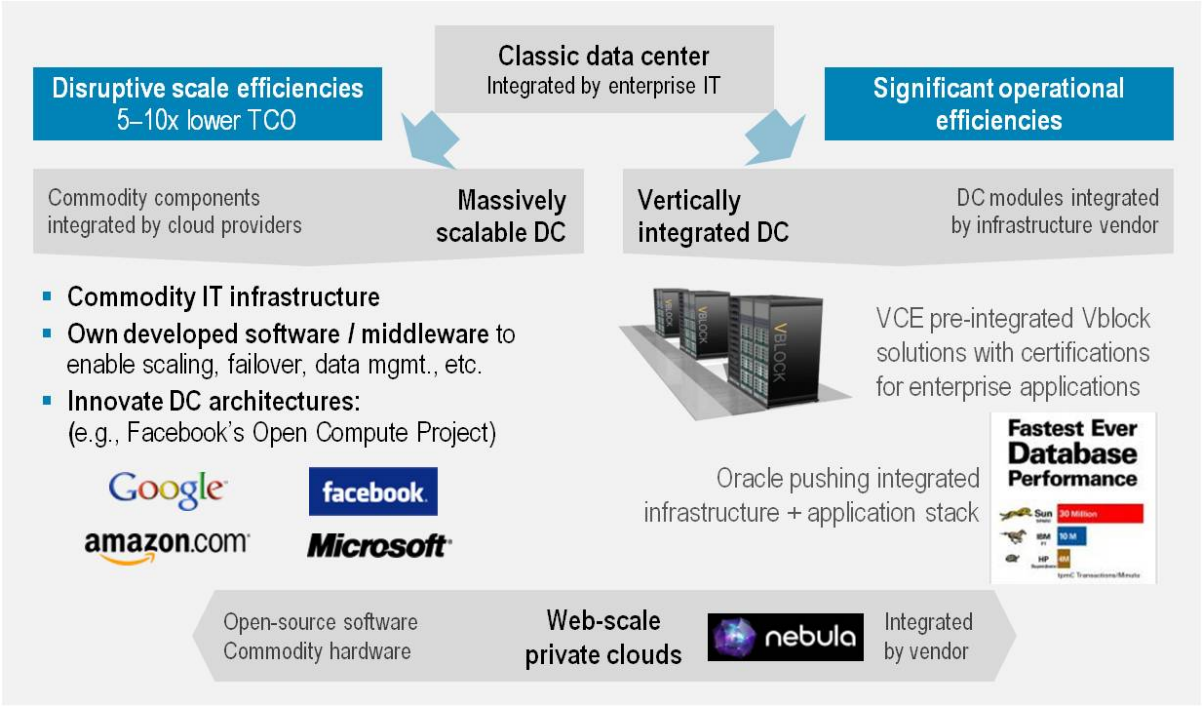
Some IaaS enabling platforms are becoming the de-facto industry standard and are being used by both internal and external cloud providers. Leading examples include Cloud.com, Joyent, Cisco Intelligent Automation for Cloud, Eucalyptus, and OpenStack. In line with this trend, Virtustream is also planning to offer its automation platform as a software stack. In turn, the growing presence of a couple of large cloud enablers is facilitating the ability to offer hybrid cloud solutions and move workloads between clouds.

A case in point is Zynga's hybrid (web-grade) IaaS implementation. Zynga used Cloud.com to build its internal cloud, Amazon Web Services for its public cloud, and the

RightScale platform to manage workloads and move them among internal and public resources.

In the enterprise-grade IaaS space, hybrid solutions are also coming to the fore. This is being driven by cloud enablers as well as by providers who deliver managed services across both hosted and internal DCs. At the end of 2010, Orange Business Services (OBS), Cisco, VMware, and EMC announced Flexible 4 Business, a program that offers dedicated cloud services across the DCs of OBS and its customers.

Figure 11. Massively Scalable DCs and Vertically Integrated DCs.



Source: Cisco IBSG, 2012

The battle between web- and enterprise-grade IaaS is closely linked to an architectural debate (see Figure 11). Web-grade clouds are often built on a paradigm of massively scalable data centers (MSDCs) in which cloud providers build large-scale facilities and fill them with commodity IT infrastructures to minimize costs. These DCs use software developed in-house to make sure large web applications are scalable and available, and have access to large data sets.

Enterprise-grade clouds, on the other hand, are seeing a very different type of innovation—vertically integrated data centers—where infrastructure vendors provide pre-integrated stacks of computing, storage, and networking that are certified for large numbers of enterprise applications. Cisco has spearheaded this trend of vertical integration with its Unified Fabric and Unified Compute architectures, and by integrating compute, storage, and virtualization in the Vblock through the VCE joint venture with EMC and VMware.

Despite strong MSDC growth (Intel expects to ship 15-20 percent of its CPU cores into MSDCs in 2012),[11] enterprise adoption is in the experimental phase. In addition, progress in this space will depend on uptake of large enterprise applications that are currently not

architected to run in MSDC environments and draw many more benefits from VDCs. Cisco IBSG sees no indication that ISVs are re-architecting enterprise applications for the massive parallelization needed to benefit from MSDCs.

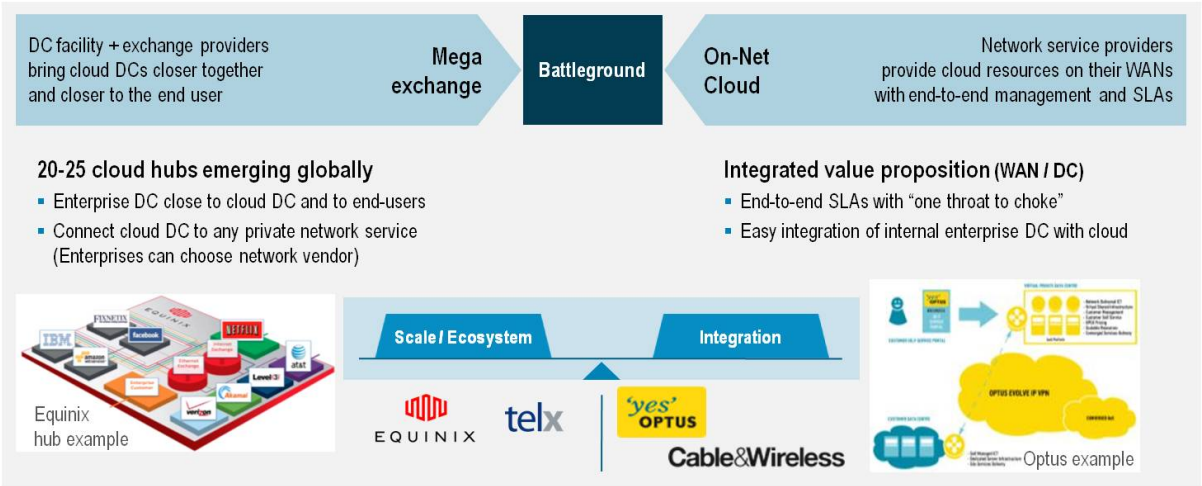
> "While massively scalable DCs are great for running very large, proprietary applications, our apps are not ready for this type of architecture. We are much more interested in vertically integrated solutions like Vblocks."
>
> CTO
> Large manufacturer

Some startups, such as Nebula, hope to benefit by combining the two approaches (MSDC and vertically integrated DCs) into one enterprise product. The company follows the MSDC philosophy by using open-source software and commodity hardware, and bundling these into pre-integrated modules that can be sold to enterprises. Since Nebula will begin taking orders for its solution in the first quarter of 2012, it is too early to assess the success of this type of offering.

Facility and Infrastructure Trends: Often-Forgotten Fundamentals

With the accelerated build-out of cloud and hosting services, the role of multi-tenant data center facilities (MTDCs) and wide-area networks (WANs) is quickly changing (see Figure 12). In this environment, two cloud facility implementation strategies are emerging: (1) mega-exchanges, which offer customers a choice among network providers in an MTDC, and (2) on-net cloud, which delivers an end-to-end value proposition across DCs and WANs. These approaches often compete for the same business and will attract different types of enterprise customers and workloads.

Figure 12. Facility: The Rise of On-Net Clouds and Mega-Exchange DCs.



Sources: Equinix, 2011; Optus, 2011; Cisco IBSG, 2012

Mega-Exchanges

Network exchanges (e.g., Equinix) double as multi-tenant DCs (MTDCs), prompting the rise of mega-exchanges. Besides the obvious benefit of sharing the cost of DC facilities, mega-exchanges give enterprises the ability to quickly interconnect cloud providers with *any* private network provider, thereby giving customers the choice of how they connect to their cloud facilities. Moreover, mega-exchanges bring cloud DCs and enterprise DCs (that use these facilities) closer together. According to Equinix, this brings together the ecosystems of similar players (e.g., finance, media) so they can benefit from low latency, reduced WAN costs, and new business models. Telx, a U.S.-based mega-exchange, also understands the importance of cloud communities and actively nurtures them with its Cloud Xchange program. Cisco IBSG believes larger enterprises, which often operate across borders and use different network providers, will benefit most from this type of open approach since it gives them the power to negotiate pricing with their SPs.

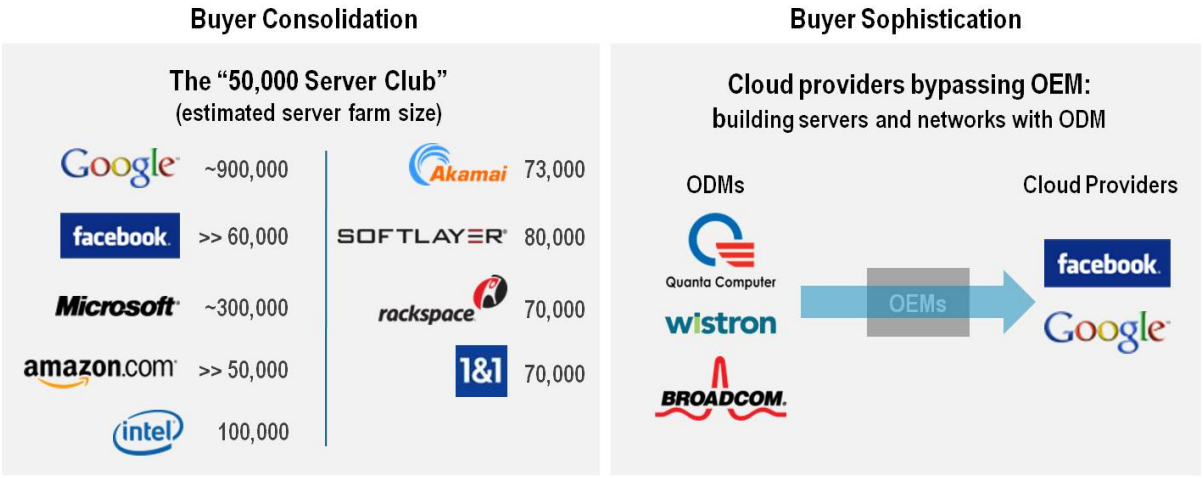
On-Net Cloud

On the other hand, network service providers are promoting the On-Net Cloud, an approach that bundles and integrates cloud services with Ethernet and IP-VPN networks. Many SPs and enterprises are very receptive to the idea of network-IT convergence, as we have established in previous research papers.[12]

The advantages for customers are obvious: being the sole provider for WAN and DC services, SPs have the ability to deliver guarantees on performance, availability, and security with "one throat to choke." These providers typically add value by extending application performance management (APM) and Layer 2 domains across WANs and DCs, thereby easing the job of managing resources across hosted and internal DCs. On-net cloud will be the method of choice for specific network-centric workloads (e.g., unified communications), and for SMBs that appreciate ease of buying and implementation in a closed and secure environment.

While an on-net cloud can be delivered from mega-exchanges, on-net cloud providers often rely on their own monolithic facilities to retain quality of service control. As these two trends evolve, it will be interesting to see which workloads and customer segments they will attract.

Figure 13. Infrastructure: The Cloud Drives Enhanced Buying Power and Sophistication.



Note: The >> symbol indicates estimates are much greater than the most recent, publicly available numbers.
Sources: "Cloud Computing Takes Off: Data Center Knowledge," Morgan Stanley, 2011; Cisco IBSG, 2012

The emergence of cloud services is causing consolidation among DCs. This is resulting in fewer and larger DCs beginning to dominate the landscape. For example, one emerging group, sometimes called the "50,000 Server Club" (see Figure 13), not only has a high degree of buying power, but also displays significant technology sophistication. They are finding innovative ways to develop their IT infrastructures by working directly with original design manufacturers (ODMs), bypassing OEMs. While it is hard to quantify, anecdotal evidence points to the growing importance of this trend.

Additionally, certain technology innovations that are closely linked to cloud DCs may be having a wider impact on ICT infrastructure providers. Software-defined networking (SDN), for example, is a new approach to networking that separates basic packet switching functions from more intelligent control functions. This idea was pioneered at Stanford University and has found a home in the Open Networking Foundation, whose most vocal supporters are cloud providers like Google.

Another innovation is the result of space and power restrictions in cloud DCs that are driving the need for high-density, low-power servers. Cloud companies have been experimenting with mobile chipsets for servers and with semiconductors that contain hundreds of cores.

These innovations are putting ICT infrastructure providers at risk of being commoditized. Providers must innovate rapidly and extend differentiated offers to adapt to these new market conditions.

Commercial Activities and Professional Services

Given the importance of commercial activities and professional services, we are devoting an entire section to these topics.

Commercial Activities

The broad range of cloud activities is driving the need to consolidate and unify cloud services. This has resulted in the "cloud broker" model, which can be applied to various stages of the cloud value chain. Cloud brokerages bring together buyers and sellers of cloud services. The cloud broker market is being accelerated by the emergence of software solutions that make brokerages quick and easy to implement. This, in turn, is leading to a multitude of players from different backgrounds that want to become cloud brokers (see Figure 14). Whether these players can build the ecosystem required to be successful will depend on the value they add beyond one-stop shopping.

Figure 14. Commercial Activities—Everybody Wants To Be a Cloud Broker.

Sources: "Cloud Computing Takes Off," Morgan Stanley, 2011; Gartner; Cisco IBSG, 2012

Approaches to cloud brokerage are very diverse. Some brokers are limited to reselling SaaS applications. Others broker cloud infrastructure dynamically by finding the cheapest IaaS capacity among various vendors; they then match this capacity with the key performance indicator (KPI) requirements specified by buyers. Still others link cloud brokerage to the emerging market of business process as a service (BPaaS): the dynamic offering of BPO through a process automation platform. Telcos are in a good position to resell simple SaaS applications because of their extensive sales channels. In addition, they can improve SaaS security and performance as well as add functionality by integrating communication capabilities into SaaS applications.

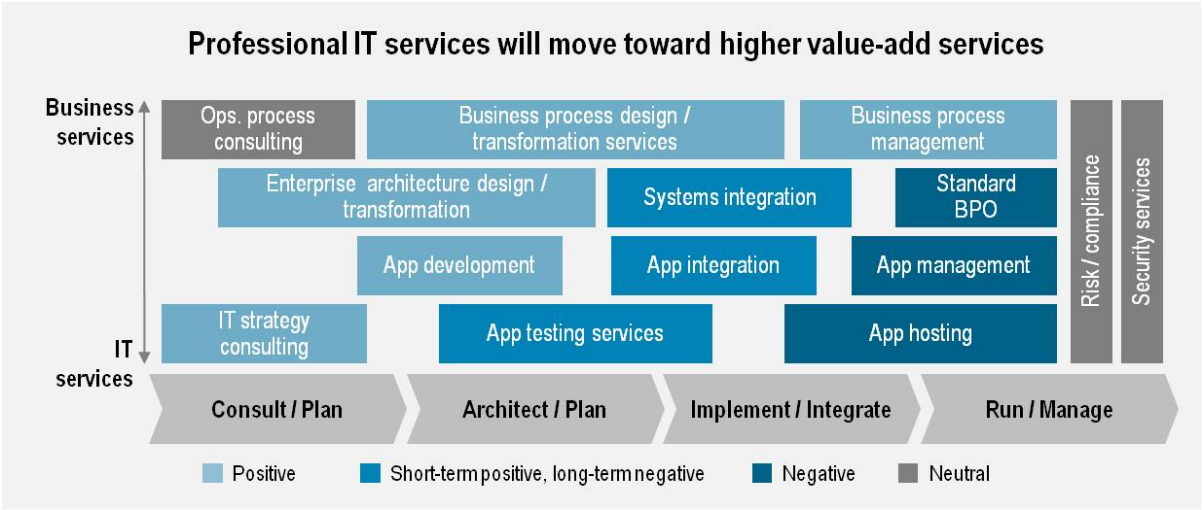
For now, it is too early to determine which type of cloud brokerage model will create the necessary scale and ecosystem to succeed. Given the high level of activity in this space, we expect cloud brokerages to dramatically change the IT sales channel landscape.

With regard to commercial activities, Cisco IBSG has also observed that despite the emergence of cloud brokers, traditional go-to-market mechanisms remain critically important. For example, many network service providers find it challenging to secure distribution channels for cloud services that have a high degree of IT complexity; these require selling into new customer departments (IT) and product environments.

Professional Services

The emergence of cloud computing will also have a strong impact on professional IT services (see Figure 15). While it may seem counterintuitive given the automated nature of the cloud, professional services are often required to help enterprises migrate workloads from legacy environments to the cloud. The cost of these services critically affects the business case for enterprises. The ability to deliver these types of services cost-effectively becomes a key success factor for cloud providers. This point is often underestimated, especially by suppliers who have typically dealt with scalable, standard product offerings in the past.

Figure 15. Professional Services Shift Focus To Add More Business Value.



Sources: IT services taxonomy from Forrester; assumptions about impact from Cisco IBSG, 2012

Given the need for migration services, Cisco IBSG expects a powerful surge in demand for integration and testing services. Even so, this demand will be temporary due to the finite number of legacy applications that need to be migrated. Standardization associated with the cloud will ease integration requirements in the long run, given that integration of predefined modules will become more prevalent than the more-invasive integration of discrete applications.

In the long term, with the focus shifting away from management and integration, more time will be spent on services that add concrete business value, including application development, strategy and transformation planning, and business process management.

As the focus shifts to business value, industry expertise will become increasingly important. This requirement will often be filled with partnerships. AT&T and Accenture, for example, teamed up to provide medical imaging solutions in the United States. From discussions with IT executives, Cisco IBSG learned that many companies with deep industry expertise feel confident about becoming industry-specific cloud providers themselves.

"It takes a lot of expertise to be successful with vertical workloads. We aim to become the cloud provider of choice for energy companies because we know the industry and we know the Smart Grid."

CTO
Large manufacturer

"We are one of the world's largest payment and cash management players. We can provide payment as a service much better and cheaper than anyone else."

Deputy Head of IT Operations
Large bank

Takeaways for NSPs

Network service providers have an interest in understanding cloud value chain dynamics so that they can keep them in mind when they choose to (or not to) attack the cloud market. Figure 16 gives an overview of what Cisco IBSG believes are viable go-to-market strategies for network service providers. The chart also includes the key takeaways that result from exposing the cloud value chain.

Figure 16. NSP Go-to-Market Strategies and Takeaways.

NSP Go-to-Market Approach	Key Takeaways
Commodity infrastructure services (with PaaS support)	▪ Current services often come from existing franchises (e.g., web hosting), but maturing cloud-enablement stacks lower barriers to entry ▪ Standardization will drive hybrid cloud deployment, so choose cloud-enablement platforms that enable this ▪ Build PaaS partnerships to attract developers (e.g., Cloud Foundry)
Enterprise-grade infrastructure services (with developer enablement)	▪ Successful players build services from existing managed hosting franchises; NSPs should build or acquire IT services and sales capabilities ▪ Provide tools that enable developers and simplify application deployment ▪ Differentiate through end-to-end WAN-IT services: on-net cloud
Telco-centric SaaS (including communications, collaboration, security, desktop services)	▪ Mobile access accelerates SaaS adoption, so integrate mobility with SaaS ▪ Launch early to preclude often-free, over-the-top communications (which are accelerated by IaaS and PaaS platforms) ▪ Differentiate through unique assets: quality of service, enterprise billing, etc.
Vertical business process services (with platform ready for BPaaS)	▪ Successful players build services from existing systems integration franchises; NSPs should consider partnering with SIs ▪ Agile OSS and BSS platforms can enable the move into the BPaaS space ▪ Embedding communications can add value: communications-enabled business processing (CEBP)
Network as a service (enrich network to better serve the cloud)	▪ Due to unclear monetization models, the market opportunity is difficult to quantify ▪ To attract developers, NSPs need to focus on standards across geographies and service provider footprints
Cloud aggregation and brokerage (linked to telco-centric SaaS)	▪ Services can be launched quickly based on commercial brokerage platforms ▪ Everybody wants to be a cloud broker; expect low-margin business for majority of brokerage and resale activities ▪ Use unique NSP assets to differentiate: quality of service, sales channels, integration of telco services, and advanced billing capabilities

Source: Cisco IBSG, 2012

Across the various go-to-market strategies, NSPs need to make a clear choice about how to address professional service requirements—either by building internally, partnering, or acquiring a company with the needed skill sets. Commercial success will often be greater and occur faster (with less risk) where new cloud business models can be layered on top of existing services. Companies that grow from the core can reuse existing capabilities, including customer relationships and sales channels. For example, companies that already have prospering collocation businesses (e.g., Rackspace) will find it easier to build and up-sell an infrastructure cloud than newcomers. For telecommunications companies, it often makes sense to grow a cloud portfolio from a base of hosted communications and collaboration products.

For NSPs that often have enormous telecommunications franchises, assessing the commercial impact of entering the cloud market can be a complex undertaking. In many cases, the contribution of cloud-based revenues will be small compared to the large amount of income generated from traditional sources. It is important to note, however, that increased

customer retention and additional revenue from cross-selling core offerings will enrich the overall business case. Finally, the business case must take a "do-nothing" scenario into account since inaction can expose network service providers to downside risks in their core business.

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Endnotes

1. The main acronyms used in this paper include:
   - Infrastructure as a service: IaaS
   - Platform as a service: PaaS
   - Software as a service: SaaS
   - Business process as a service: BPaaS
2. Source: Cisco IBSG, 2012.
3. Note: The TCO does not include equipment costs.
4. Source: "Network Service Providers as Cloud Providers," Cisco IBSG, November 2010.
5. Source: Tier 1, 2010
6. Sources: OpSource, 2011; Citrix, 2011.
7. Sources: Joyent, 2011; Nimbula, 2011; Eucalyptus, 2011.
8. Source: Cisco, 2011.
9. Sources: Verizon, 2011; CenturyLink, 2011; and Dimension Data, 2011.
10. Source: Tier 3, 2011.
11. Source: Intel, 2011.
12. Sources: "Converged Network-IT Services," Cisco IBSG, August 2009; "Network Service Providers as Cloud Providers," Cisco IBSG, November 2010.

More Information

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