An Evaluation Framework for Selecting an Enterprise Cloud Provider

This White Paper is intended for senior IT leaders of global enterprises considering a new cloud solution or expanding an existing cloud solution, and provides insight into:

- Key drivers behind the shift to cloud services
- Key criteria and guidelines for evaluating cloud providers
- Key questions you should be asking potential cloud providers
Introduction

Despite the advantages of lower cost and easier management that ignited the widespread interest in cloud computing, concerns about security and control over applications have kept some savvy IT professionals on the sideline.

Four key themes are emerging as the drivers for moving to cloud services:

1. Enhanced Business Agility and Minimized Cost
2. Streamlined IT Operations
3. Seamless Integration and Customization
4. Risk Management

1. Enhanced business agility means being able to respond faster and more efficiently to business changes. The ability to dynamically expand and contract computing, storage and network capacity dramatically minimizes cost and reduces the time required to develop new applications, while deploying resources where they are needed, when they are needed.

2. Moving resources to the cloud streamlines IT operations and allows businesses to focus on their core mission. It helps reduce the cost, staff, and overall complexity of maintaining computing, storage and network infrastructure in-house.

3. Businesses need the ability to seamlessly integrate existing enterprise IT environments when moving to customized public and private clouds.

4. Managing risk is a core aspect of managing IT infrastructure. Loss of control of resources and maturity of resources both introduce risk to the enterprise. Consolidating resources onto shared infrastructure with shared management, giving cloud providers control over underlying enterprise computing, storage and networking infrastructure introduces new forms of risk into the IT operations. As a result, and understandably, security, availability and performance are consistently identified as top CIO concerns.

Cloud providers are innovating rapidly and new services and concepts are announced daily. With so many complex moving parts, it can be challenging to select the right enterprise cloud provider.

This white paper provides an evaluation framework for selecting an enterprise cloud provider for your organization. In addition, this evaluation takes a comprehensive view of a company’s IT requirements.

Gartner projected spending on public cloud services to reach $109 billion in 2012, an increase of more than $91 billion over 2011.
Enterprise Cloud Evaluation Framework Overview

The Evaluation Framework focuses on key criteria to help a company assess cloud implementation strategies. This paper provides enterprises with objective advice as they seek to understand any cloud provider’s ability to meet business and technical requirements.

Figure 1 highlights these key criteria.
When a company acquires IT technology, it typically conducts a selection process including a review of the performance, reliability, compatibility and security attributes that will fulfill the requirements of its IT needs. Most large companies prefer using proven technology from innovative vendors that have demonstrable experience solving similar IT requirements.

Using best of class vendors with industry standard technology can allow for a seamless integration of cloud technology into an enterprise’s existing IT infrastructure. The same criteria used for internal assets should apply to an enterprise cloud evaluation. A cloud provider should be transparent about which vendor technologies are implemented and how this can affect their service level agreements. With this information, the enterprise can make more informed decisions about the reliability and viability of the technology with which they will be integrating.

**Key Questions to Ask:**

- Does the cloud solution support industry-standard, enterprise-grade cloud technologies that meet demanding security, performance and availability requirements?
- Are the underlying technologies comparable, or better, in quality, security and reliability to what I use today within my internal IT environments?
- Are the vendors and standards used in the cloud provider’s services compatible with my internal IT vendors and standards?
- If I were building this myself, what technology would I use?
- How well does this integrate into my technology?

---

**1. ENTERPRISE-GRADE & INDUSTRY-STANDARD**

When a company acquires IT technology, it typically conducts a selection process including a review of the performance, reliability, compatibility and security attributes that will fulfill the requirements of its IT needs. Most large companies prefer using proven technology from innovative vendors that have demonstrable experience solving similar IT requirements.

Using best of class vendors with industry standard technology can allow for a seamless integration of cloud technology into an enterprise’s existing IT infrastructure. The same criteria used for internal assets should apply to an enterprise cloud evaluation. A cloud provider should be transparent about which vendor technologies are implemented and how this can affect their service level agreements. With this information, the enterprise can make more informed decisions about the reliability and viability of the technology with which they will be integrating.
A comprehensive enterprise cloud strategy should be comprised of a full suite of services including managed services, consulting services, the ability to customize hybrid solutions, management, monitoring, security and more.

Since the enterprise cloud represents an integration of many infrastructure components, it is important to understand how much of the cloud is under the direct control of the cloud provider and how much flexibility the enterprise has in the cloud environment.

The best way to assure consistent performance, availability and access is to work with enterprise cloud providers that own and control all aspects of their cloud solution. Cloud service providers who manage their own global networks, data centers, components and related services can assure consistent service levels, transparency and accountability for their users.

Key Questions to Ask:

What cloud services do I need to solve my IT challenges?

Does the cloud provider allow me to implement a global hybrid public/private enterprise-grade cloud solution including dedicated servers, managed services, colocation and customization?

Which of these managed services does the provider offer: security, storage, backup, network, disaster recovery, server operating system and application?

Are there other services that I would need in the future?

How much of the total solution does the cloud provider own and control?

Understanding the true cost of your cloud solution can be difficult if a cloud provider uses a complicated billing model that is onerous to decipher and track. Services should be clearly defined and easily measured to ensure an accurate Total Cost of Ownership (TCO) calculation. The cost of a total enterprise cloud solution should include not only the cost of computing, network, and storage, but also the trade off with capital expenditures that would provide access to an enterprise-grade infrastructure.
4. CLOUD CONSULTING SERVICES

An enterprise cloud provider that offers a comprehensive and sophisticated suite of consulting services is better suited to support you in your efforts to build a cloud business strategy, cloud security risk management plan or a methodology for on-boarding existing applications into the enterprise cloud. Such services are also valuable in helping you position your cloud strategy for success internally.

Key Questions to Ask:

Does the cloud provider offer comprehensive cloud consulting services from strategy through implementation?

Can the provider help me determine the best cloud solution based on the needs and objectives of my business?

Will the provider help me develop a cloud security risk management plan?

Will the provider calculate Return-on-Investment?

Will the provider help me architect cloud-aware and cloud-enabled applications?

Will the provider help me on-board applications into the cloud?

5. CLOUD AUTOMATION

One of the most interesting and powerful benefits of enterprise cloud computing is the ability to control the cloud directly from an application (a cloud-aware application) or through IT automation tools. This requires access to a cloud Application Programming Interface (API) that is standards-based with an emphasis on multiple security levels such as authentication, access control and other industry best-practices protection. Because the API is the entry point to cloud services, automating the security of the API saves time and mitigates risks.

Key Questions to Ask:

Does the cloud provider provide programmatic control of my cloud, via an API?

Does the provider help me enable cloud-aware applications?

What steps does the provider take to secure the API access to my cloud? Are they adequate?

6. 24X7 CUSTOMER SUPPORT

How a cloud provider supports enterprise cloud users is a critical component of any selection evaluation. Users relinquish control of some of the physical aspects of their systems when they move to the cloud. A company may do business globally, but local accountability to resolve issues quickly is vital to any cloud initiative. When issues arise, trained technical experts should not stop at the implementation level. Access to senior-level engineers who can directly resolve a problem saves both time and money. Because of the importance of the enterprise cloud to operations, a cloud provider should offer 24x7 support staffed by senior-level engineers.

Key Questions to Ask:

Does the cloud provider give me 24x7 technical phone support staffed by human beings?

Who exactly handles support and where are they located?

What is the support model?

What level of engineers are part of the support team?
7. NETWORK INFRASTRUCTURE

A cloud provider’s network infrastructure is fundamental to high speed, efficient cloud application accessibility and management. This requires a carrier-grade global network that is continually upgraded to offer competitive performance levels and incrementally expands as needed. An enterprise may require cloud integration with sophisticated private networking capabilities, such as MPLS, or a high-speed connection between data centers. A cloud provider’s expertise should include the ability to optimize content delivery through the network or leverage enterprise-grade, hardware-based load balancers.

Key Questions to Ask:

Does the cloud provider offer world class enterprise networking capabilities including a Tier 1 global IP network, high speed data center interconnection, MPLS and VPN?

Does the cloud provider offer hardware-based enterprise-grade load balancing?

Does the cloud provider offer content delivery network (CDN) services?

What type of networking options does the cloud provider offer?

8. SERVICE LEVEL AGREEMENTS

Most cloud providers provide a service level agreement (SLA) including guarantees for availability, and may offer service credits for down time. SLAs should guarantee network and server uptime as well as address latency and even support response times. Cloud providers with confidence in their solutions will provide monitoring software to ensure a company has visibility and control over both the promised performance and alignment with cost.

Key Questions to Ask:

What is covered in the cloud service provider’s SLA?

Does the provider guarantee 100% uptime?

Does the cloud provider offer cloud performance monitoring and reporting?

9. TRANSPARENCY AND VISIBILITY

An informed decision about a cloud strategy rests as much with the reputation of the provider as it does with the cost savings associated with implementing an enterprise cloud. For example, offering SLA monetary credits may not compensate the enterprise for the full range of losses from an IT outage.

Your enterprise cloud provider should give you total transparency and visibility into how they achieve their features, functions, management, operational, security, performance and availability claims, and should be open about their vendor relationships.

Key Questions to Ask

Does the cloud provider reveal the architecture, technologies and infrastructure used within the cloud to deliver my services?

Does the provider provide real-time visibility into the underlying infrastructure?

When I pay for cloud computing capacity, am I confident I am getting what I paid for?
2.5 quintillion bytes of data are created every day. Bursting keeps big data from busting your network.
Source: IBM

10. ROLE-BASED MANAGEMENT

The enterprise cloud portal that centralizes control over IT resources is a vital element of an enterprise cloud strategy. A role-based management system should allow permissions to align with the varying levels of responsibilities of individuals in the IT organization. Role-based management enables the systems to be tailored to allow or restrict access to cloud resources appropriately. For example, only certain users should have the ability to delete servers or access specific resources.

Key Questions to Ask

Does the cloud provider support role-based administrative accounts so that individual permissions can be assigned to users?

Can I limit control of specific cloud resources (servers, storage and networks) to specific users?

11. ELASTICITY AND BURSTING

Being able to meet unpredictable capacity demands is fundamental to a successful cloud implementation. These demands have two key components: elasticity and bursting. Elasticity is the ability to add or reduce capacity on an as needed basis, and bursting is the ability to add incremental capacity for unanticipated increases in demand. Both elements provide flexibility in handling demand and an important factor is an enterprise cloud provider that guarantees a convenient means for expanding and contracting resources upon request.

Key Questions to Ask:

Does the cloud provider allow me to burst beyond my purchased cloud capacity?

Does the provider guarantee that burst capacity will be available to me when I need it?

Is it truly guaranteed capacity or am I relying on the cloud provider’s oversubscription model?

Can I reduce the resources without any penalty?
**Key Questions to Ask:**

Does the cloud provider offer a single integrated portal or single pane-of-glass visibility to all of our services including cloud, dedicated servers, network services, managed services, integrated trouble ticketing, asset management and support?

How easy and intuitive is the portal to use?

How do I access this portal?

Who can access this portal?

What rights can I assign?

What reporting capabilities does it provide?

**12. UNIFIED MANAGEMENT**

A comprehensive enterprise cloud provider can offer companies a range of services necessary to leverage the full potential of the cloud. A single management portal for all services is the most efficient way to manage the day-to-day aspects of a cloud implementation, whether the company needs to implement a customized solution, dedicated servers, managed services or colocation as part of their cloud solution.

---

**Key Questions to Ask:**

Does the cloud provider offer enterprise-grade security appliances from vendors I rely on today — ones that are tested and certified?

Can I leverage intrusion prevention systems (IPS) and enterprise-grade hardware-based firewalls?

Do I have access to audit logs and asset-based usage reporting?

Does the cloud provider offer managed security? Encryption for virtual machine instances? Machine level security hardening?

**13. ENTERPRISE SECURITY**

Cloud security is the top concern for CIOs today. An informal survey of the public cloud space shows a wide range of security maturity levels among cloud providers. For example, many enterprise cloud providers cannot implement a network-based intrusion detection system and some providers settle for unknown software-based access control with no logging or visibility, bypassing industry-standard and certified firewall systems.

Most companies would never take such risk with their enterprise security. The same attention should be applied to a cloud security implementation. A comprehensive security approach to the enterprise cloud includes security visibility (logging, network-level security); innovative enterprise-grade tested and certified security components; reputable and recognized vendors; and the option to have security managed as a service.

---

Inability to measure security services and confidence in a provider’s security capabilities are among the top 3 public cloud computing security concerns for IT professionals.

Source: Intel Peer Research Report, May 2012

“What’s Holding Back the Cloud”
The enterprise cloud provider should offer a way to clearly and cleanly allocate cloud compute, storage and network resources to specific applications.

Key Questions to Ask

- Does the cloud provider offer me tools to organize servers into unique and manageable groups that align with your application architecture?
- Can I execute cloud operational commands across those groups?
- Can I flexibly allocate compute, storage and network capacity for groups of servers?
- How quickly can I scale up those resources?

14. CLOUD OPERATIONS & RESOURCE ALLOCATION

An enterprise cloud provider’s management portal provides a single interface through which compute, network and storage resources can be managed. It is important that the cloud portal can organize cloud resources into logical groupings that mirror the way an enterprise’s application infrastructure is architected, operated and maintained. Grouping infrastructure used in a single application in the cloud allows users to replicate the environment of their own data center. The enterprise cloud provider should offer a way to clearly and cleanly allocate cloud compute, storage and network resources to specific applications. This is the most effective way to control and predict application performance and cost.
Conclusions

It is important that the evaluation and selection of an enterprise cloud provider include a comprehensive look at all aspects of a total enterprise solution and IT environment. The enterprise cloud provider should be transparent in how it meets your security, performance and availability objectives. A customized solution should allow you to streamline IT operations and seamlessly integrate in order to meet the unique needs of your business.

NTT Communications offers a comprehensive enterprise cloud solution and as a trusted advisor and business partner, has provided this cloud evaluation framework to help you carefully select your enterprise cloud provider. NTT Communications is committed to meeting the true needs of your business and welcomes the opportunity to talk more about how the NTT Communications Enterprise Cloud can be part of your total enterprise solution. For a point-by-point outline of how NTT meets the criteria outlined in this framework, contact a representative today.

Learn more about NTT Communications Cloud services at http://www.us.ntt.com/cloud. Twitter: @ntt_america