INTRODUCTION

Today’s enterprises are facing a vast array of changing market dynamics. These dynamics range from accelerating globalization and an economy that continues to be significantly challenged to the need for access to real-time information, the ability to support a much more mobile set of buyers and users, and the integration of new communications media and information sources such as social networks and blogs. As shown in Figure 1, the top imperatives facing enterprises as a result of these market pressures involve the need to reduce operational costs while focusing on building stronger customer relationships and improving financial management. Further, while companies indicate their need to drive new products and/or services into the market, time-to-market metrics are pressuring enterprises to accelerate this process. But achieving these goals will require executives to find a means to better link IT with their business processes, focus their people on strategic initiatives, and build consensus across their organizations, as highlighted in Figure 2.

The combination of these issues is placing pressure on executives to seek a means of utilizing IT more optimally to help achieve these business imperatives while overcoming these challenges. The result is that many enterprises are pursuing the use of cloud computing and services as part of a strategic transformation of their capabilities that can support these ever-demanding market and corporate objectives. However, in implementing cloud initiatives, customers have many questions and concerns regarding what issues they should focus on, what types of applications and technologies are best suited to and can be supported by today’s cloud capabilities, and what considerations they should make when utilizing third-party services providers as part of supporting their cloud initiatives.

The focus of this white paper is to offer both business executives and IT executives insights into the key issues that customers consider paramount when utilizing cloud services, paying particular attention to the types of applications organizations currently view as applicable for use within a cloud environment. This paper provides a framework of cloud options that will help organizations achieve their corporate objectives as well as key drivers and inhibitors customers consider when using cloud services. This paper also includes a snapshot of CSC and how its cloud capabilities can provide the support companies need in implementing the breadth of cloud options.
Figure 1

Top Customer Imperatives

- Reduce operational costs
- Strengthen and expand customer relationships
- Improve financial management
- Drive product innovation and market thought leadership
- Improve employee satisfaction and retention
- Ability to attract and hire top-performing employees
- Shorten time to market and product development cycles
- Adherence to regulations (e.g., Sarbanes-Oxley)
- Other

(Share of responses)

Source: IDC, 2011
MARKET OVERVIEW

In today’s cost-conscious and fast-paced environment, enterprises are looking to transform and optimize their IT capabilities to support their corporate needs. A strategic part of this transformation is centered on adoption of cloud solutions and services for which the following are key market trends:

- **Transforming internal enterprise environments to cloud-based delivery capabilities.** Companies are implementing an array of technologies within their own IT environments to create what is referred to as a “private” cloud (dedicated to a single organization). In addition to technologies such as management systems, security, and storage backup, which are required to support a private cloud, technologies such as virtualization, provisioning systems, services catalogs, metering and billing systems, as well as an IP-based network are critical to helping develop an environment that operates like a private cloud. Fundamental factors driving enterprises to transform their internal environments and create a “private” cloud include the need to lower costs by optimizing
utilization of their infrastructures, improve linkages between IT and business processes, and support greater flexibility in driving products and services to market more quickly.

Increasing adoption across the breadth of cloud services. Enterprises are utilizing a range of cloud services, which are highlighted in Figure 3 and referred to as a "life cycle" of services. They include services that support development and testing of application and infrastructure environments, referred to as PaaS and TaaS, respectively. Other services involve provisioning of operational services including infrastructure (IaaS) and applications (SaaS). While there already has been considerable adoption of SaaS, enterprises are rapidly expanding their use across the full range of cloud services just mentioned. (See the Portfolio of Cloud Options section for a more detailed discussion of these services.) Key drivers for customers in using these services include not just lowering costs but also reducing the cycle time needed for development and testing, improving the speed with which they can modify and enhance applications and business processes, and gaining access to skills and resources while shifting their financial business model from a capex structure to an opex structure.

Utilizing a hybrid of private and public cloud services options. A common approach to using cloud services is for enterprises to utilize a combination of private clouds and public clouds. In essence, companies are integrating their own private clouds, which they may either manage themselves or outsource to a third-
party provider to manage, with public clouds, which are owned, managed, and provisioned by the service provider. For customers, hybrid models provide a means by which they can improve the financial management of their businesses by minimizing their total spend on IT and business services. The use of hybrid clouds also enables enterprises to assign the most appropriate cloud type, private versus public, to specific application and business process environments based on key factors such as security requirements, need for bursting (e.g., extra capacity), and regulatory factors, to name a few.

- **Targeting specific technology and application environments.** The IT environments that customers are selecting as primary candidates to be used as part of a cloud are broad and varied. They range from key infrastructure areas (e.g., storage, systems management) to strategic application environments, such as collaboration and analytics. However, the means by which customers make these selections is driven by a variety of factors, including the size of the company and industry in which the company competes and other key issues such as time to market, mission-critical nature of an application, and business process the application supports, as well as expected issues such as regulatory factors and security concerns.

- **Changing expectations of service delivery.** Customer expectations in using cloud services, particularly from third parties, are changing dramatically. Examples of these changes include faster provisioning of applications, higher levels of availability (e.g., always on), more robust backup and recovery, and the ability to tailor services to specific user groups or individuals, to name a few. These expectations are changing because enterprises need to support buyers in more real time, ensure that services are available for customers wherever they are in the world, and offer services to a more mobile population whose expectations increasingly require the provisioning of location-based, proactive services (e.g., informing customers of new product and service offerings).

---

### Customer Preferences for Private and Public Cloud Usage

The adoption of private and public clouds by application environment varies according to specific enterprise needs. As Figure 4 highlights, the top business applications for which enterprises would use a private cloud include customer relationship management (CRM), data warehousing, enterprise resource planning (ERP), and accounting/finance. In contrast, the top business applications for which enterprises would use a public cloud include CRM and data warehousing as well as office and productivity and messaging.
Benefits and Challenges of Cloud Services

A number of key benefits are associated with using clouds. As shown in Figure 5, benefits include the ability to pay for only what is used. Given enterprises’ need to optimize investments and ROI, having access to services that enable companies to
pay for just what they consume can help firms minimize their investments in IT. Additionally, enterprises view cloud services as a means of faster deployment of capabilities to end users, which can enable them to keep pace with faster time-to-market requirements and customer needs. Further, getting access to the latest functionality can help enterprises ensure market competitiveness.

**Figure 5**

Key Benefits of Cloud Services

- Pay for only what you use
- Easy/fast to deploy to end users
- Always offers latest functionality
- Encourages standard systems
- Requires less IT staff, costs
- Sharing systems with partners simpler
- Seems like the way of the future

Source: IDC, 2011

Figure 6 provides feedback on the key challenges customers face when using cloud services. The top challenge, which is to be expected, is security, which customers consistently rate as the leading concern they have when using clouds. With the potential problems that ineffective security can create, which could result in damage to a company’s brand or significant loss of business, it will be crucial that the cloud environment be designed with a full range of security capabilities such as threat identity management, firewalls, intrusion detection, access control, and single sign-on. In addition to security, companies are concerned about potential decreased availability and performance. Lack of availability and performance can result in a reduction in employee productivity, lost revenue, and delayed production. For internal cloud services providers, security, availability, and performance issues will stall the migration to cloud — especially for mission-critical services. For external cloud services vendors, such problems can lead to customer churn and damage to their brand. It will be critical that cloud environments, whether built for internal use or procured as a service, incorporate all the requisite technologies and appropriate architectures (e.g., redundancy) to provide the availability and performance needed to ensure optimal performance.
PORTFOLIO OF CLOUD OPTIONS

The portfolio of cloud options is extensive, as shown in Figure 7. Fundamentally, there are two types of business models when using clouds. One involves a "private" cloud in which the cloud environment is "dedicated" to a single organization and can be managed either by the customer or by an outsourcer/service provider. In contrast, a public cloud involves third-party services in which "unrelated" customers, or organizations, utilize the same service. In addition to these two different business models, the range of cloud services, whether used for private or public purposes, involves the following types:

- **PaaS (platform as a service).** PaaS provides customers with the ability not only to custom develop applications but also to migrate legacy applications and enable them to work in a cloud. This may involve refactoring and rewriting existing legacy code. Key elements in this type of cloud service include the provisioning of a software platform that uses an integrated development environment with a suite of tools and runtime capabilities.

- **TaaS (testing as a service).** TaaS involves the provisioning of services that can support the testing of application and infrastructure technologies. Critical aspects of this type of service include the use of virtualized, scalable on-demand test labs with Web interfaces for self-provisioning and management of multiplatform environments.
**IaaS (infrastructure as a service).** IaaS provides users with an infrastructure environment that provisions elastic and scalable capacity for processing power and storage when needed.

**SaaS or SaaS enabled (software as a service).** SaaS involves the provisioning of applications "on demand" in which a third-party provider operates the service. However, this type of service can involve a service provider or an outsourcer managing an independent software vendor's (ISV's) software and provisioning the software "as a service." These services include the use of modular, Web-based applications but are delivered in a shared services environment, referred to as a public cloud.

---

**FIGURE 7**

**Spectrum of Private and Public Cloud Options**

<table>
<thead>
<tr>
<th></th>
<th>Insourced Private Cloud</th>
<th>Outsourced Private Cloud</th>
<th>Outsourced Public Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Onsite and/or colocated at vendor data center</td>
<td>Onsite or hosted at vendor data center</td>
<td>Vendor data center</td>
</tr>
<tr>
<td><strong>Management responsibilities</strong></td>
<td>Customer</td>
<td>Customer and vendor</td>
<td>Vendor</td>
</tr>
<tr>
<td><strong>Ownership</strong></td>
<td>Customer</td>
<td>Customer or vendor</td>
<td>Vendor</td>
</tr>
<tr>
<td><strong>Payment</strong></td>
<td>T&amp;M</td>
<td>Fixed fee or pay as you go</td>
<td>Fixed fee or pay as you go</td>
</tr>
<tr>
<td><strong>Customer</strong></td>
<td>Single, dedicated organization</td>
<td>Single, dedicated organization</td>
<td>Multiple &quot;unrelated&quot; organizations</td>
</tr>
</tbody>
</table>

Note: CSC BizCloud is included in the outsourced private cloud category.

Source: IDC, 2011
CSC CLOUD CAPABILITIES

CSC is one of the first vendors to offer a private cloud that is installed on a customer's premises and billed as a service. Referred to as CSC BizCloud, this off-premises IaaS cloud business model combines the privacy, security, and control of a private cloud with the service billing, elasticity, and convenience of a public cloud. For payment and financing, monthly billing is based on usage and no capital investment is required because the on-premises infrastructure is owned by CSC. Based on CSC's expertise and experience in onboarding and building cloud-enabled data centers, the company commits to customer delivery of this on-premises cloud offering in 10 weeks.

CSC BizCloud is ideally suited as the centerpiece of a virtualized on-premises data center or as a component of a hybrid cloud service. Underpinning CSC BizCloud is the provider's IaaS, CSC CloudCompute, which is consistent across CSC BizCloud (IaaS on-premises private cloud) as well as CSC's off-premises private and public IaaS deployment offered from its 12 worldwide Trusted Cloud data centers. These three cloud deployment options, shown in Figure 8, include the same rate card structure, service levels, and security and management options. As organizations expand the use of hybrid clouds (i.e., the combination of both private clouds and public clouds) as part of their long-term strategy, the ability to leverage CSC CloudCompute IaaS offerings involving both on-premises and off-premises should simplify management complexity, financial management, and interoperability between private and public cloud services.

### FIGURE 8
Overview of CSC CloudCompute Services Offerings and Capabilities

<table>
<thead>
<tr>
<th>Off Premises</th>
<th>Off Premises</th>
<th>On Premises</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public</strong></td>
<td><strong>Private</strong></td>
<td><strong>Private</strong></td>
</tr>
<tr>
<td>• Leveraged</td>
<td>• Dedicated Access</td>
<td>• Behind client firewall</td>
</tr>
<tr>
<td>• At CSC data centers</td>
<td>• At CSC data centers</td>
<td>• Capacity: projection-based</td>
</tr>
<tr>
<td>• Capacity: virtually unlimited</td>
<td>• Capacity: projection-based</td>
<td>• Minimum capacity commitment and annual term</td>
</tr>
<tr>
<td>• Standard rate card applies</td>
<td>• Requires minimum commitment for 3 months</td>
<td>• Standard rate card applies over minimum</td>
</tr>
<tr>
<td>![Diagram 1](source: CSC, 2011)</td>
<td>![Diagram 2](source: CSC, 2011)</td>
<td>![Diagram 3](source: CSC, 2011)</td>
</tr>
</tbody>
</table>

123

BizCloud
The underlying cloud fabric that CSC uses to deliver services for all three CloudCompute deployment models is the Vblock Infrastructure Platform from VCE (The Virtual Computing Environment Company). Vblock integrates virtualization software, networking, security, computing, storage, and management technologies from Cisco, EMC, and VMware. CSC hosts off-premises IaaS clouds at its tier 3 access-controlled, fault-tolerant SAS 70 Type II audited data centers. For security and continuity requirements, CloudCompute layers in CSC’s in-depth security framework, which includes data protection options of disk backup, offsite backup, vulnerability scanning, and antivirus protection and is designed to extend the inherent resiliency of the Vblock fabric. CSC offers customers four tiers of service from 99.0% to 99.95% availability backed by a service-level agreement (SLA) for all three CloudCompute services as well as the option of having CSC provide 24 x 7 operations management at the operating system level through the entire software stack. The ability to mix and match these services will help customers select the most appropriate cloud delivery model and tier of service and management based on workload requirements to meet the desired cost, security, and service profiles.

To help speed adoption of these cloud services, CSC offers cloud assessment and workload planning; the Smart Start proof-of-concept (POC) program; service catalog refinement and workflow development for chargeback and billing to internal clients; as well as application-specific portal configurations. CSC also offers services to support enabling applications to work in a cloud environment. These services include application portfolio reviews, application transformation, replatforming, and refactoring. The breadth of CSC’s capabilities and expertise in application development, management, security, and business process transformation is enabling CSC to support customer adoption of cloud services across the full breadth of cloud services options.

**Challenges for Outsourcers**

CSC provides a robust set of cloud capabilities to support a full range of cloud services that involve not only transforming customer environments to be cloud enabled but also provisioning cloud services as part of an outsourced engagement whether for private or public usage. However, CSC and the community of outsourcers and service providers face the following key challenges:

- **Showing the ability to meet the range of key services requirements.** Meeting the customer need for highly secure services and SLAs that support stringent high-availability requirements (e.g., 99.99% uptime) is paramount. Providers will need to assure customers that they have the capabilities (e.g., security expertise, industry knowledge) and strategic investments (e.g., redundant security operations, secure data centers) to deliver on these requirements. Further, providers will need to provide key services capabilities such as billing and metering services that will be critical in supporting procurement of cloud services.

- **Having the appropriate expertise and skills needed to create cloud environments.** While the skill sets needed to create and deliver cloud services are very similar to existing skill sets, key areas of concern include having the skills to architect a cloud environment that meets strict security and high-availability needs and the ability to provide the 24 x 7 operations management needed to meet stringent SLAs (e.g., 99.99% uptime) for cloud services that are outsourced.
Supporting effective governance to enable customer management of cloud services. Key to successful procurement of cloud services is having effective governance capabilities to manage a cloud provider. With regard to customer concern about not having the appropriate skills to manage these types of suppliers, service providers need to offer clients effective program and project management that includes clear and open communication as well as well-defined rules of accountability.

Providing a coherent framework of clearly defined services. The market is crowded with terms associated with cloud services, such as on-demand and utility computing, and the different perceptions of these services. To avoid customer confusion, and to ensure customer selection of appropriate services, service providers must offer a cohesive and coherent framework of offerings that spells out in simple terms the types of options available to buyers.

RECOMMENDATIONS: ASKING THE RIGHT QUESTIONS

The journey to implementing and using clouds, whether for private or public purposes, requires customers to make a series of major decisions to optimize their investments. As part of these decisions, enterprises are assessing the role of third-party service providers in supporting their shift to creating clouds or procuring services using cloud environments. Whether clients look to these providers to build turnkey solutions or provision cloud as a set of outsourced services, IDC believes that it is critical to evaluate service providers on their ability to meet key business and service criteria. To better prepare you to begin the evaluation process of utilizing a service provider, IDC has provided the following checklist of questions. These questions should be directed at understanding if the service provider has the capabilities to fulfill key requirements that clouds and your organization demand:

- Is the service provider financially stable and viable? Is it a trusted provider?
- How much productivity can be gained by utilizing cloud services?
- Does the provider understand the specific needs for and have the capabilities to support those applications that you will look to use in a cloud?
- Is there an optimal combination of private and public cloud services that would optimize business performance?
- What are the potential cost savings that the different cloud options can help achieve?
- Does the provider offer SLAs, which may include financially based SLAs and in which penalties are invoked, to ensure performance of cloud services as well as required security capabilities?
- Can the provider not only support your business globally but also deliver solutions that meet local cloud needs?
Does the provider understand your business, business risks, and regulatory requirements, such as HIPAA and the Basel Accord, which may impact the effectiveness of the clouds you implement? (Prospects should ask for reference customers in similar industries or lines of business.)

To help assess which applications are best suited for migration to cloud architecture, please visit our online readiness assessment tool.