

## ARTICLE

## CLOUD COMPUTING PRIMER:

**Introduction to Cloud Computing Services****Benefits**

- Lower TCO
- Usage-Based Billing
- Scalable, On-Demand
- Enterprise-Class
- Guaranteed Service Levels
- Highly Secure Platform
- Flexible Management
- Application-Enabled
- Full Customer Support

**Introduction**

Cloud computing has undoubtedly produced a disproportionate share of early market buzz. Touted as a transformative enterprise IT delivery model, the cloud promises both economic efficiency and improved business agility. The good news is that the cloud is living up to its early market promise.

Cloud computing is an evolution propelled by new IT delivery models and enabling technologies. Initially, driven by cost concerns, enterprises turned to collocation as a more efficient IT delivery model. The next logical step, managed hosting, allowed enterprises to leverage the management expertise – and efficiencies – of service providers. At the same time, new enabling technologies, such as virtualization, utility computing, web services, and service oriented architecture (SOA), have yielded newer and greater data center efficiencies, resulting in more enterprise-friendly IT delivery models.

But, even with these new delivery models and technologies, enterprises must still plan for uncertainty. What will average demand look like? What additional IT resources will be required to handle expected and unexpected demand spikes? There are no easy answers to these questions, forcing enterprises to build out their IT infrastructure to accommodate projected peak demand requirements, incurring capital and operational costs for idling and underutilized servers, as well as for additional physical space, power and cooling. Cloud computing addresses these uncertainties, bringing predictability, agility, and cost-efficiency to the enterprise.

**What Exactly Is Cloud Computing?**

Cloud computing takes several – often interrelated – forms. Software-as-a-Service (SaaS) is a hosted, cloud-based delivery model that provides enterprise users with on-demand access to applications. Platform-as-a-Service (PaaS) is also an application delivery model, but one that provides a comprehensive development platform for applications and services. Finally, Infrastructure-as-a-Service provides the underlying infrastructure – for example, virtualized servers and storage – as an on-demand service. Though each of these models has a compelling value proposition, this article focuses on IaaS.

At its core, cloud computing is on-demand provisioning and usage of elastic IT services. Cloud computing employs a pay-for-use billing model, ensuring that users pay only for what they provision and consume. Early-market cloud offerings were ideal for application development. Software developers, for instance, could quickly provision resources to accommodate their project requirements, and then turn off these resources once the development project reached completion.

**Defining the Enterprise-Class Cloud**

So, what should enterprises look at when evaluating cloud services? Sure, they must present economic value. That's a given. But, total cost of ownership, though important, is at best, a minimum requirement. Enterprises must also look closely at reliability, security, and transparency. And, perhaps what truly defines an enterprise-class cloud service is management.



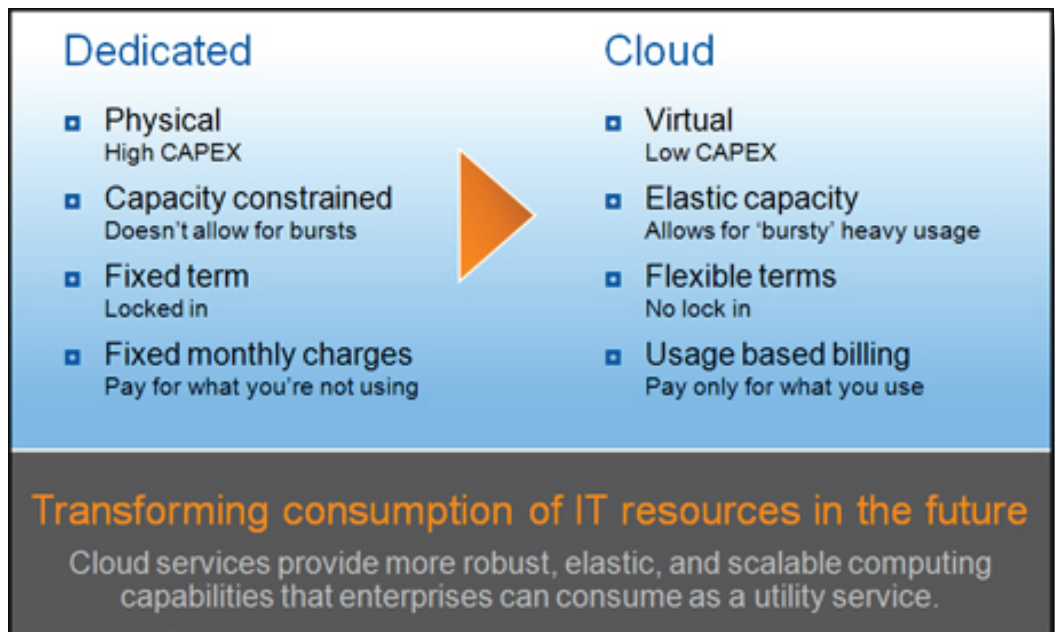
*"A style of computing where scalable and elastic IT-enabled capabilities are delivered as a service to customers using Internet technologies."*

- Gartner Group, 2010

The cloud service should provide enterprises with the tools – a web-based management console, for instance – for real-time monitoring, provisioning, and management of resources, including computing capacity, memory, storage, and bandwidth. Highly granular management capabilities ensure that enterprises use only the resources they need. Some cloud service providers also allow enterprises customers to use the management console to monitor the performance of applications on the infrastructure cloud.

Though some enterprises prefer to self-manage their resources, most enterprises require a more comprehensive management capability from their cloud service providers. Why? As enterprises start moving more of their workloads to the cloud, the complexity of managing the cloud environment becomes more complex and challenging. Without an appropriate level of management from the service provider, issues, such as VM sprawl, can eat away at the benefits of a cloud service.

So, what is an appropriate level of management? That depends on the scale, complexity, and type of workload. An enterprise-class cloud service provider should offer several management configurations, to address a range of customer requirements. Enterprises that need reliable production environments for critical and complex applications, typically require a fully monitored and managed infrastructure cloud, along with various managed services, including network management; security management; disaster recovery; and SAS70 or PCI compliance.



Other enterprises may only need an on-demand, fully monitored infrastructure, giving them insight into how their infrastructure is being used, and allowing them to optimize their IT environments and use resources more efficiently. Finally, some enterprises may prefer – at least, initially, a self-managed option. A self-managed configuration is appropriate when an enterprise is using the cloud as a robust test environment that does not tax their in-house data centers. In this scenario, the sandbox offers a robust build-destroy-build environment for deploying multiple test environments, with a range of choices for operating systems, databases, and middleware.

### Enterprise-Class Infrastructure

An enterprise-class cloud service must be built on highly-resilient, state-of-the-art enterprise-class infrastructure – both hardware and software – which must be configured for high-availability. High-speed connections to physical servers should be coupled with load balancing technology to ensure that even the most complex applications scale to meet business demand.

Though not a requirement, an enterprise-class cloud service should have a geographically dispersed footprint. Enterprise customers can choose a specific regional datacenter to deploy their cloud, perhaps reducing bandwidth costs and satisfying certain regulatory requirements.

A geographically dispersed footprint also enhances disaster recovery and business continuity, which should be integral to an enterprise-class cloud service. Enterprises must assess the disaster recovery capabilities of cloud service provider and receive assurances – in the form of service level agreements – that even in worst-case scenarios, they will be back on-line quickly.

### Highly Secure Platform and Service

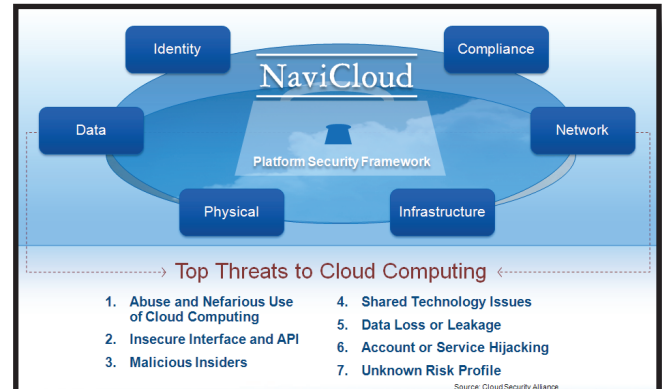
An enterprise-class cloud service should also ensure the security, privacy, and integrity of enterprise applications and data. A cloud service should provide a range of security measures including two-factor authentication; network intrusion detection and prevention; automated vulnerability scans; and third-party penetration testing. Advanced firewall technology should provide intelligent threat defense with advanced capabilities, including identity-based access control and denial of service (DoS) attack protection. Additionally, data centers should be compliant with SAS 70 Type II Certification requirements for physical and logical security.

Security should also extend to the management interface. Role-based access control, for instance, ensures that users have only the permissions required for their business or support roles. The service provider should also be able to set permissions on objects or groups. All activity should be logged for auditing purposes.

### An Adaptable and Transparent Cloud

Enterprises have differing requirements. Some may want to dive right in to cloud computing, while others may want to test the environment first. An enterprise-class cloud service must be adaptable – able to accommodate different deployment models. Enterprises should consider the following:

- **Customized Solutions:** Enterprise cloud services are not “one size fits all.” Cloud service providers need to work closely with enterprise customers to build robust, highly customized solutions to address unique and varied IT requirements.
- **Virtual and Dedicated Infrastructure Services:** Some enterprises are not ready to make a full commitment to the cloud. They may, for instance, have concerns about certain sensitive applications and data. Or, there may have to comply with certain regulations. Still, these enterprises may still be leveraging some aspects of a cloud service. The underlying enterprise cloud platform should enable customers to combine virtual and dedicated infrastructure services to create high-performance hybrid IT environments, allowing organizations to augment their internal IT capabilities with cloud services.



## ABOUT NAVISITE MANAGED CLOUD SERVICES (MCS)

NaviSite's Managed Cloud Services enable on-demand scalable provisioning of IT services including applications, servers, storage, and networks. The NaviCloud Platform offers unique enterprise IT advantages that tap into the core of NaviSite's application and enterprise infrastructure management expertise.

Designed specifically to meet enterprise IT demands, the NaviCloud Platform delivers services on best-of-breed technology infrastructure from leading vendors including Cisco Systems™ and VMware™ - all provided under one of the industry's strongest SLAs.

Whether supporting seasonal computing demand spikes, creating robust and cost-effective soft-

ware testing and development environments, or building full application lifecycle management for mission critical enterprise applications, the NaviCloud Platform offers today's premiere cost-effective enterprise-class infrastructure option.

## Benefits

### *Lower Total Cost of Ownership*

- **Usage-based billing:** Enterprises do not incur the hefty capital expenditures associated with building and maintaining an in-house data center. Usage-based billing is linked to the provisioning process – enterprises make base-level commitments and can scale up or down based on need. This 'pay for use' billing model yields savings of 20-40%, compared to traditional infrastructure hosting services.
- **Efficient Resource Utilization:** The virtualized slices of resources ensure enterprises purchase and use only what they need – eliminating the hidden costs of IT resource underutilization.

### *Business Agility and Operational Efficiency*

- **Speed of Deployment:** Enterprise-class cloud services accelerate the time to value for enterprise customers by eliminating long procurement cycles associated with in-house development projects, and ensuring that deployments move quickly from staging to live production.
- **Simplified IT Operations:** A fully-managed option delivers an enterprise-class, cloud-enabled IT environment, while eliminating the complexity of managing an in-house data center. From resource provisioning and security management to operating system, network, and application management, an enterprise cloud service makes IT faster, simpler, and more efficient.

### *Guaranteed Service Levels*

- **Guaranteed Service Levels:** A true enterprise-class cloud service is backed by industry-leading service level guarantees for performance, availability, and 'response and resolution.'
- **Business Continuity and Performance Manageability:** An enterprise-class cloud service includes 24x7 monitoring and support, and geographically dispersed data centers to augment built-in disaster recovery capabilities.

To speak with a cloud computing expert, please call NaviSite at 877-485-9251 or visit our Web site at [www.navisite.com](http://www.navisite.com).

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# NaviSite®

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400 Minuteman Rd  
Andover, MA 01810

[www.navisite.com](http://www.navisite.com)  
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