



The Silver Lining of Cloud Computing

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Agenda

- What is Cloud Computing?
- Characteristics
- Service and Deployment Models
- Advantages and Disadvantages
- Planning for a Cloudy Day



According to NIST

- Cloud computing is still an evolving paradigm
- Definitions, attributes, and characteristics will evolve and change over time



Evolution of the Cloud Concept

- Idea of a public utility computing model first suggested in 1960
- Telecommunications providers migrated circuits to virtual private networks in the 1990s
 - Routed traffic to balance network load as needed
 - Comparable service at lower cost
 - Cloud symbol used to identify the VPN portion of the network
- Cloud computing expanded the concept to servers



NIST Defined Cloud Model

- Promotes Availability
- Composed of:
 - Five essential characteristics
 - Three service models
 - Four deployment models



NIST Essential Characteristics

- On-demand Self Service
- Broad Network Access
- Shared Resource Pool
- Rapid Elasticity
- Measured Service



NIST Service Models

- Software as a Service (SaaS)
 - Customer use of a provider's application via thin client interfaces
- Platform as a Service (PaaS)
 - Customer deployment of an application using the provider's application platform
- Infrastructure as a Service (IaaS)
 - Customer access to processing, storage, networks
 - Customer may control operating systems and applications



NIST Deployment Models

- Private cloud
- Community cloud
- Public cloud
- Hybrid cloud



Private Cloud

- Operated solely for an organization
- Management
 - Managed by the organization or by a third party
- Location
 - On-site or off-site



Community Cloud

- Shared by several organizations
- Supports a specific with shared concerns
 - Mission, security requirements, policy, compliance
- Management
 - Managed by the organization or by a by a third party
- Location
 - On-site or off-site



Public Cloud

- Provided for the general public or a large industry group
- Owned and managed by a vendor selling cloud services



Hybrid Cloud

- Composed of two or more clouds based on different models (private, community, or public)
- Clouds remain unique entities
- Clouds linked by technology enabling data or application portability
 - Load balancing between clouds



Cloud Advantages

- Defers and avoids costs
- Consumption-based pricing model
 - Pay only for used services
- Increases IT agility and return on investment
- Public cloud support for mobile workforce
- Lower cost disaster recovery option



Cloud Disadvantages -Burton Group

- Inadequate, inflexible, or nonexistent cloud service level agreements
- Poor vendor transparency
 - Inability to assess risks or audit cloud security
- Vendor lock-in due to lack of interoperability
- Market immaturity



Will It Be a Cloudy Day?

- Factors for determining where to run your application
 - Performance, storage, security, availability and data transfer requirements
 - Service level agreements
 - Mission criticality
 - Internal resource availability
 - Cost



Foundation of the NCC Cloud

- Shared application platforms since 1997
 - Supporting 100s of national applications
 - Shared resource pools to reduce costs
- Mid-range modernization 2005 - 2007
 - IBM P Series server virtualization
 - 3PAR SAN storage virtualization
- Akamai public access failover capability in 2007
- x86 server virtualization initiated in 2009
- WAN2010 implementation broadens network access in 2010

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NCC Cloud Futures

- Multi-pronged approach
 - NCC hosted Infrastructure as a Service (IaaS) private cloud
 - NCC hosted Platform as a Service (PaaS) private cloud
 - Public and community cloud partnerships
- On-demand self service ordering interface
- Rapid elasticity based on server virtualization
- Measured services include monitoring and reporting of resource usage for customers



NCC Infrastructure as a Service (IaaS)

- Web ordering interface
 - # processors, GB memory, GB disk
- Rapid provisioning of FISMA compliant virtual server
- Customer administered server
- Customer ISO responsible for security certification
- Lowest cost option with minimal support
 - Consulting support provided at additional cost



NCC Cloud Pilot

- VMWare Server Virtualization
 - Eliminates cost, time, and effort required to provision new servers associated with each new requirement
 - Increases utilization and efficiency of server operations

- Cloud Management Software
 - Web-based menu of standard packages and options
 - Self-service ordering
 - Coordination and automation for faster provisioning
 - Greater visibility

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Service Offerings

The screenshot displays a web application interface with three main service offerings arranged horizontally. Each offering is presented in a light blue box with a title, an image, and a description.

- Server Management:** Features an image of a row of server racks. Below the image, the text reads "Server Management" and "Browse...".
- Storage Management:** Features an image of two server units. Below the image, the text reads "Storage Management".
- Supporting Services:** Features a large blue plus sign icon. Below the icon, the text reads "Supporting Services".

The interface includes a search icon in the top left corner and navigation arrows in the top right corner.

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Platform, OS, or Function

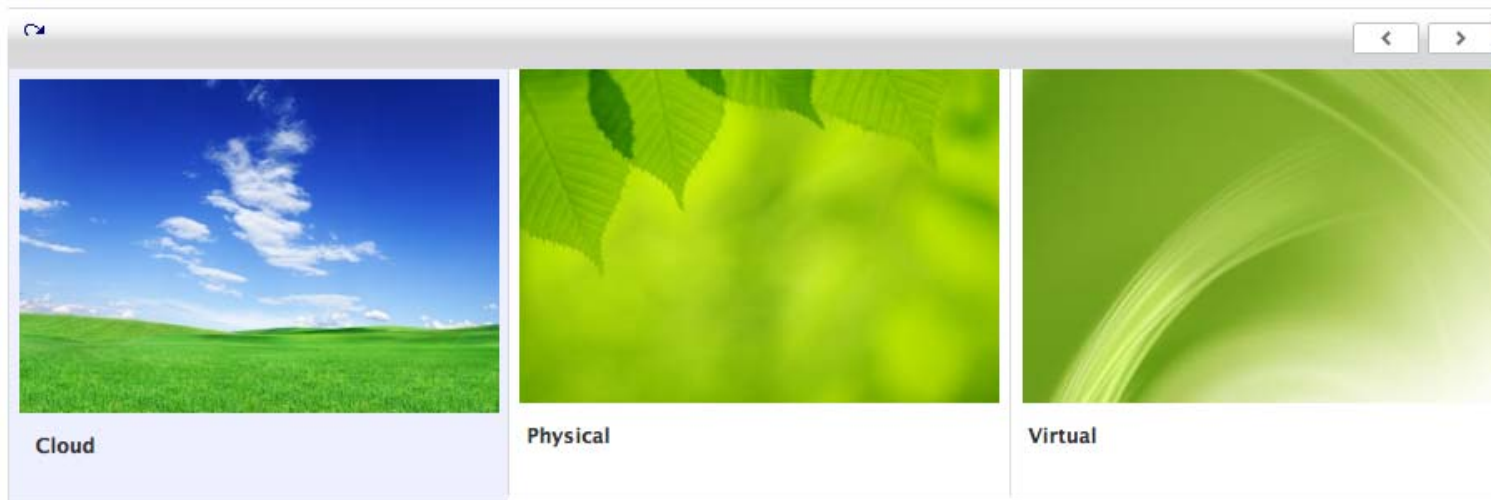


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Service Offerings by Category



Service Offerings

Locate Service Offerings by Category



Cloud

Cloud computing provides a pool of virtualized resources within a datacenter – an internal cloud, or federated on-demand to external clouds. They deliver IT infrastructure as an easily accessible service.



Physical

Physical servers provide low-cost web hosting services. Instead of requiring a separate computer for each server, dozens of virtual servers can co-reside on the same computer, providing fast time to value and cost savings.



Virtual

Physical hardware provides robust, dedicated environments for requirements.



VM Template Selection

Virtual machine template selection

- ▶ Select the data center where the virtual machine will be deployed
Not seen by customer

For optimal network performance, select a data center location nearest to your worksite.
- ▶ Select a template group

VM Template options are available for multiple environments.
- ▶ Select a virtual machine template/image name

Select a pre-defined virtual machine template.
NOTE: If you require additional software to be installed on the VM environment, submit soft has been provisioned.

Virtual machine template/image description	Medium Windows Server	
Guest operating system	winNetStandardGuest	
Hard disk size	50000000	(KB) Standard D: drives capacity on Windows; Standard /usr/Software file folder drives capacity
Memory	2000	(MB) Additional memory may be requested after the VM Server has been provisioned.



MyServices Listing

newScale9 Module MyServices [Chris Consumer] Profile Logout

Home Requisitions Copy Requisition **Service Items**

Service Item Types

- [All Service Items]
- Agreement Capacities
- Application Access
- Database Hosting
- PDA and Smart Phones
- Virtual Hardware**
 - Virtual Machine**
 - VM Snapshots

Service Items

Export To Excel Save View Filter and Search

Name	Assigned Date	Requisition ID	Submitted Date	Customer	Organizational Unit	DNSName	IPAddress	DataCenterName
NS_DEV001	04/19/2010 5:4...	200	04/19/2010 5:3...	Chris Consumer	Marketing			Datacenter-San...
NSDEV_035	03/29/2010 2:3...	177	03/29/2010 2:2...	Chris Consumer	Marketing			Datacenter-San...
test1	03/27/2010 7:3...	176	03/27/2010 7:3...	Chris Consumer	Marketing			Devdata
RHEL_005	03/18/2010 2:4...	128	03/18/2010 2:4...	Chris Consumer	Marketing			Devdata
WIN2K3_001	03/18/2010 2:3...	126	03/18/2010 2:3...	Chris Consumer	Marketing			Datacenter-San...

Page 1 of 1 Displaying 1 - 5 of 5

Related Services Service Item Details Requested With History

- Add Network Interface to Virtual Machine** Order
Add a network interface to an existing Virtual Machine.
Note: Only one network interface will be added per request.
- Archive Existing Virtual Machine** Order
Archive an existing Virtual Machine.
- Backup Snapshot for VM** Order
Request a snapshot of a running VM.
- Decommission VM** Order
Request this service to shut down and decommission an existing Virtual Machine. This service may be used by VM owners, or (in some circumstances) by administrators to recover capacity on the ESX server.

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Component Menu

The screenshot shows a web browser window titled "newScale RelationshipManager: Detailed Information for Self Service Virtual Server Administration - Windows Internet Explorer". The address bar shows the URL: <http://demo9.newscale.com/RequestCenter/myservices/navigate.do?query=serviceid&module=slm&sid=91&presentModule=RM>. The main content area is titled "Detailed Information for Self Service Virtual Server Administration Bundle". It features a table of "Component Services" and a sidebar menu.

Service Name	Description
Backup Snapshot for Virtual Machine	Request a running VM be saved and stopped.
Backup Snapshot for VM	Request a snapshot of a running VM.
Delete Existing Virtual Machine	Request a running Virtual Machine be deleted.
Modify CPU Allocation for Virtual Machine	Modify CPU allocation for an existing Virtual Machine.
Modify Memory Allocation for Virtual Machine	Modify memory allocation for an existing Virtual Machine.
Schedule Activity on Virtual Machine	Schedule an activity for an existing Virtual Machine.
Start a Stopped Server - Demo	Request a previously-stopped VM be restarted.
Start a Stopped Server	Request a previously-stopped VM be restarted.
Stop Virtual Machine	Request a running Virtual Machine be saved and stopped.
Take Snapshot and Modify Existing Virtual Machine	Request a snapshot be taken and modification made to an existing Virtual Machine.

The sidebar menu on the right includes "Overview", "Component Services" (which is selected), and "Cost Details". At the bottom right of the page, there is a "POWERED BY newScale" logo.

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Server Administration



Virtual Server Administration

- Self-Service Administration
- Instant Access to Servers
- Simplified Server Management

Search for Services Available for Carol Manager

Search for services containing:

Search

(Title and Keywords only)

Locate Services for Carol Manager by Category



Manage Existing Virtual Machine Servers

Self-service management of basic systems administration functions for your virtual machines, including power cycle operations and back-up (snapshots).



Modify Existing Virtual Machine Servers

Manage the service lifecycle of your existing virtual machines, including changes to memory and CPU allocation and the scheduling of other activities.



Manage Virtual Machine Templates

Create and manage and remove virtual machine templates.



Modify ESX Servers

Manage physical ESX servers and their related storage and memory requirements.

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Reporting

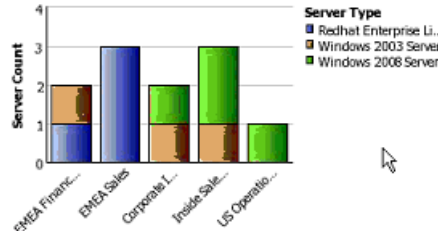
newScale9 Module: **Advanced Reporting** [Carol Manager] Profile Logout

[Home](#) [Ad-Hoc Reports](#) [Report Designer](#) [KPI Administration](#)

Cognos Viewer - Server Management Dashboard

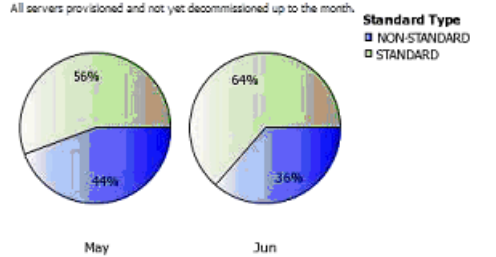
Carol Manager [Log On](#) [Home](#) [Launch](#) [About](#)

Provisioned Servers by Business Unit



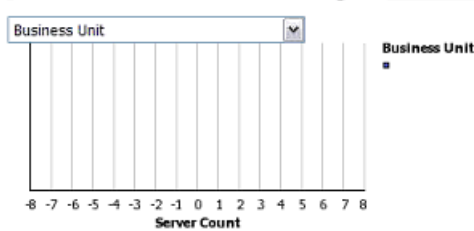
[Tabular Report](#)

Provisioned Servers by Standard Type



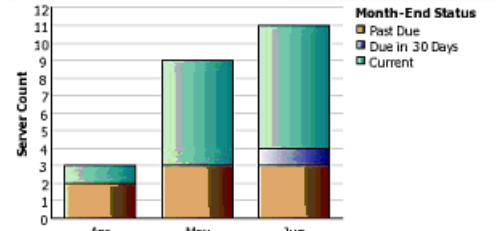
[Tabular Report](#)

Provisioned Servers Past Decommissioning Date



[Tabular Report](#)

3-Month Provisioned Server Detail



[Tabular Report](#)

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NCC Platform as a Service (PaaS)

- Web ordering interface
 - Application platform (e.g., LAMP Domino, ColdFusion, etc.)
- Rapid provisioning of FISMA compliant virtual server
- NCC administered server, customer administered application environment
- Customer ISO responsible for application security certification
- Low cost option with minimal support for application platform
 - Consulting support provided at additional cost

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Public and Community Clouds

- Investigate customer interest in external hosting alternatives
- Identify cost effective solutions providing FISMA compliant options
- Implement contract vehicles as necessary
- Establish simplified ordering processes



The Clouds are Coming

- Building an internal cloud positions the organization to more easily migrate to external offerings
- Compare costs of internal and external clouds
- Consumer organizations must maintain responsibility
- Use the cloud to right-size IT and as reserve capacity
- Identify security risks before data goes in the cloud



Summary

- The silver lining
 - Scalable – Access to additional computing resources when needed
 - Agile – rapid provisioning
 - Reliable – Multiple servers provide cloud capacity
 - Utility-based – Pay for services used
 - Shared – Resources are shared to reduce costs



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