

Virtual Server and Storage Provisioning Service

Service Description



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Revision History

Version	Date	Status	Summary Of Modifications	Author
1.0	03-06-2008	Complete	First Release	Andrew Butler & Maria Linnane
1.1	28-11-2008	Complete	Pricing change and mirrored storage option added	Maria Linnane

Related Documents

Document Name	Author	Document Location
<End User pack>		

Approvers

Approver Name	Job Title
Kieran Loftus	Director of Computer Services
Andrew Butler	Head of Infrastructure Services
Conor McMahon	Head of Customer Services

Introduction

Virtual Server and Storage Provisioning Service Overview

The Virtual Server and Storage Provisioning Service includes the following tasks:

1. Server Provisioning, using Virtual Machine Technology (VMware) and high availability storage (Storage Area Network - SAN).
2. Support Services, Backup and System Status Reports.

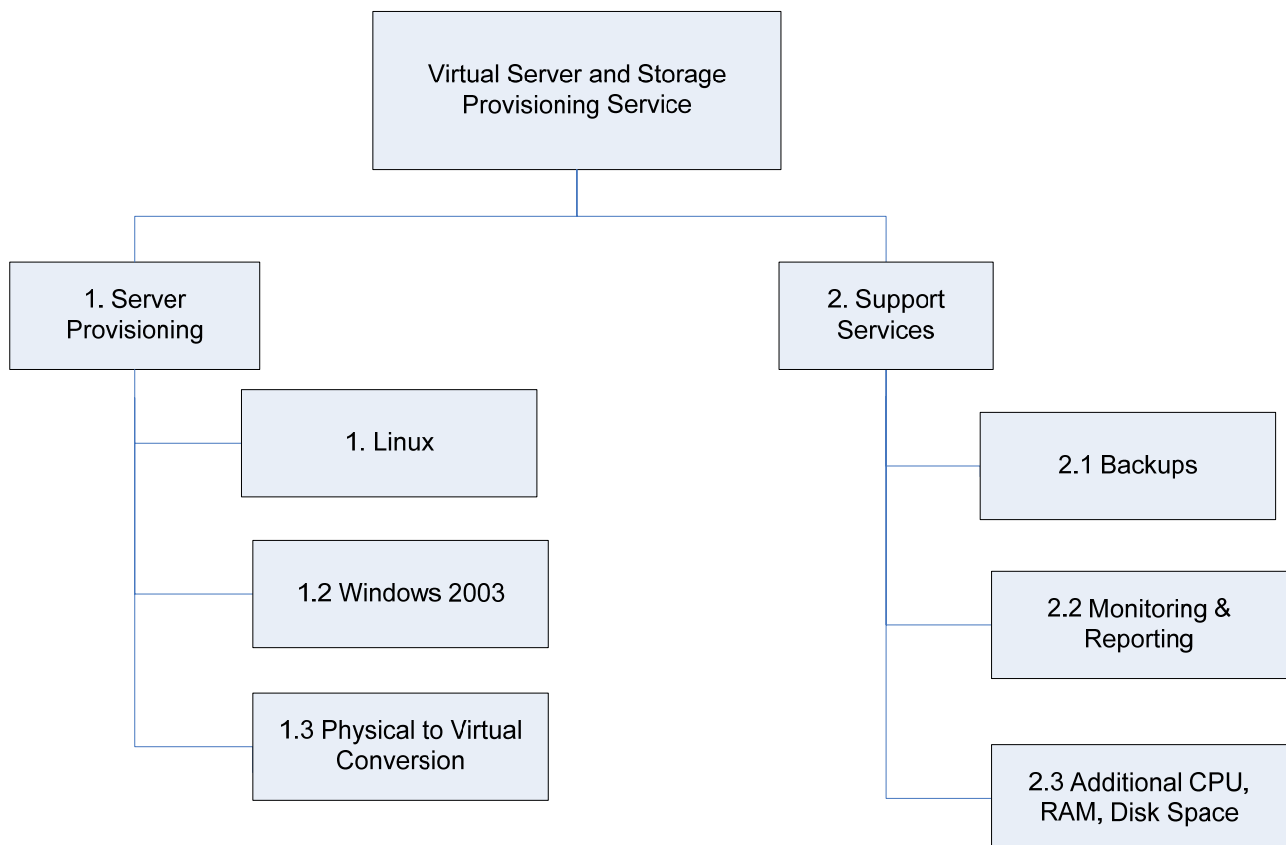
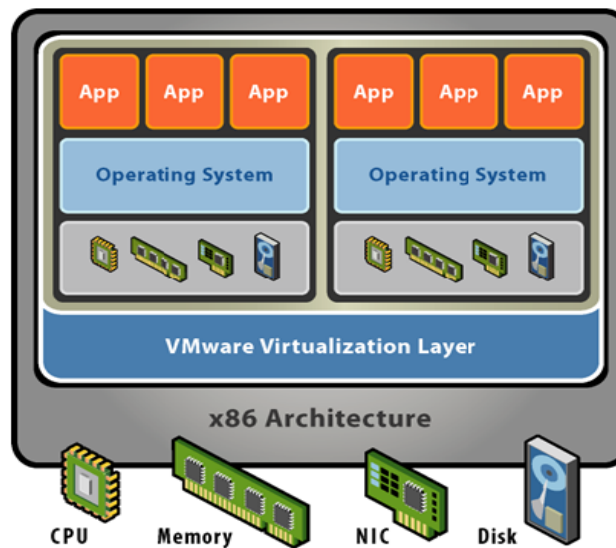


Figure 1 Virtual Server and Storage Provisioning Service

What is a Virtual Server?

A virtual server is an isolated software container that can run its own operating systems and applications as if it were a physical computer. A virtual server behaves exactly like a physical computer and contains its own virtual (i.e., software-based) CPU, RAM hard disk and network interface card (NIC).



Virtualization essentially lets one computer do the job of multiple computers, by sharing the resources of a single computer across multiple environments. Virtual servers let you host multiple operating systems and multiple applications on a single server.

What is Storage Area Network (SAN)?

Storage Area Network is a network of storage disks. Computer Services uses a SAN to connect multiple servers to a centralized pool of disk storage. Compared to managing multiple servers, each with their own disks, SANs improve system administration. By treating all the organisation's storage as a single resource, disk maintenance and routine backups are easier to schedule and control. Computer Service's SAN based data is replicated to an off-site SAN in real time and daily, weekly and monthly backups are maintained on off-site hard disks and tapes.

Service Availability

The underlying infrastructure is highly available and fault tolerant. Nominal planned availability will therefore be 99.7%. Planned outages will be scheduled and communicated with the Customer in advance.

Users of the Service

Research, academic and administration functions within NUIG.

Server & Storage Provisioning

Standard Hardware Specification

Virtual Servers are configured with the following hardware specification by default:

- 1 CPU
- 2 GB RAM
- 10GB System Disk and 50GB additional disk

Servers are provisioned with a 10GB system disk and 50GB additional disk by default. Additional space can be request on the second disk and will incur additional cost. It is considered best practice to install applications on a separate disk to the operating system.

Standard Server will be priced at €1,400 per unit, once off charge.

Computer Services can offer as an option, Windows System administration and monitoring of your virtual machine. Monitoring alerting mechanisms will follow standard Computer Services' practice and will be defined during set-up phase of the System Administration service. Maintenance tasks included are as follows:

- University Standard Antivirus Software and Updates Updates
- OS Security Patches
- Backup Client Upgrades
- Disk Defragmentation

To request the optional monitoring and maintenance service, specify this when requesting your server. Alternatively, you may request this service at any time by opening a ticket with the User Support Centre. The service is charged at €100 per month per server.

Additional CPUs, memory and hard disk space can be facilitated upon request, but will incur additional costs.

Mirroring

Computer Services provides two storage configuration options; mirrored and not mirrored. Mirrored storage replicates data in real time between two Data Centres, for intermediate disaster recovery. This feature provides a highly available and resilient environment.

Additional Storage (No Mirroring)

	Tier 1 Storage (Fibre Channel RAID 10)	Tier 2 Storage (Fibre Channel RAID 5)	Tier 3 (SATA RAID 5)
100Gb	€1,500	€750	€500
250Gb	€3,000	€1,500	€750
500Gb	€6,000	€3,000	€1,250
750Gb	€8,000	€4,000	€1,500
1Tb	€10,000	€5,000	€2,000

Additional Storage (Mirrored)

	Tier 1 Storage (Fibre Channel RAID 10)	Tier 2 Storage (Fibre Channel RAID 5)	Tier 3 (SATA RAID 5)
100Gb	€2,000	€1,000	€500
250Gb	€5,000	€2,500	€1,000
500Gb	€10,000	€5,000	€1,500
750Gb	€14,500	€7,500	€2,500
1Tb	€19,000	€10,000	€3,000

- Tier 1 storage is most suitable for high speed on-line transactional type applications, for example high speed transactional databases. Note, such application are not normally suitable for virtualized machines and this storage is normally allocated to SAN attached physical machines.
- Tier 2 is a compromise of transactional speed vs. affordability. This is the main storage medium on which the virtual machines and their storage will reside. Suitable for high capacity medium throughput databases such as Microsoft Exchange.
- Tier 3 storage is most suitable for use as a traditional file server data repository and archiving of high data volume low transactional volume applications such as image storing.

Additional CPUs:

Up to three additional CPUs can be provisioned and are charged as follows:

- One additional CPU - €500
- Two additional CPUs - €750
- Three additional CPUs - €1,250

Additional Memory

Additional Memory can be provisioned. Total memory is charged as follows:

- 4GB - €500
- 6GB - €750
- 12GB - €1,750
- 16GB - €2,500
- 24GB - €3,250
- 32GB - €4,000

Charges are incurred in order to maintain resource availability i.e. fund the scaling of the virtual server and SAN environment according to 'dynamic' requirements rather than fixed cycle funding allocations. Charge amounts are subject to change.

Standard Network Specification – Internal or External Access

The default network configuration is internal access. This means that the server will reside the University's internal network and be available to internal NUIG users only. No remote access, from outside NUIG will be available for these servers. Servers with external access requirements will reside in a secure DMZ network. Such servers will be exposed to all the vagaries of the public internet. The list of ports open on the DMZ is included in the Firewall Ports section. Support requirements for external facing servers will be significantly higher as a result if the server and their data are to remain secure. All OS and application support is the responsibility of the customer.

Server Provisioning

Computer Services currently support the following Provisioning Services:

Service Name	Service Description	Response time
Provision Cat A Server	Provision of a Linux Server with additional storage	4 working days
Provision Cat B Server	Provision of a Windows 2003 Server with additional storage	4 working days
Physical to Virtual Conversion	Physical to Virtual Conversion of a standard and non standard server	Case by case basis

New Windows 2003 or Linux Virtual Server

The base OS will be installed and configured using standard defined templates. Memory, CPU & Hard Disk space will be allocated based on the standard hardware specification (see Standard Hardware Specification). System Administration support and maintenance of the base OS and installed applications is the sole responsibility of the customer. Computer Services will provide health monitoring of the Production server environment only. Computer Services, can on request implement alerts on Production Servers, for virtual hardware resource, OS and application parameters. Details should be entered into server request form.

<u>Windows Server Configuration:</u>	<u>Linux Server Configuration</u>
Windows 2003 Enterprise Edition both 32-bit and 64-bit Windows Service Pack 2 All updates up to April 2008 Tivoli Storage Manager 5.5 client ePolicy Orchestrator Agent McAfee Virus Scan	Linux Redhat Enterprise 5.1 Apache 2.0 (default install) IBM Director Client 5.2 Updates to April 2008 Tivoli Storage Manager 5.5 client

Physical to Virtual Conversion (P2V)

The P2V service is a mechanism to covert a physical server to a virtual server. The technical overview of the service provisioning is based on a highly available SAN and VMware infrastructure. The P2V process is a mechanism in which a physical server running with an Intel CPU is converted to be virtual server. P2V requests will be performed in two phases. The initial phase will be one hour consultation to validate whether the P2V process will be possible. The second phase will be performing the actual P2V process on the server. IP addressing and storage requirements will be discussed as part of the initial consultation.

This service requires the assistance of our VMware vendor. A quotation will be generated following the technical overview. Generally, costs will be minimal for standard operating systems that are supported natively by VMware. Additional costs will be normally incurred when the need to overcome complexities associated with virtualising non-standard operating systems (such as NT or a particular flavour of Linux) and server configurations.

A standard P2V request matches the following criteria:

- Windows 2000 or Windows 2003
- Approx 100GB of data
- 1-2 CPU's
- 2-4GB RAM

Support Services

Hardware Monitoring

Computer Services will only monitor virtual hardware server status events on production servers. Test servers will not be monitored by Computer Services. To enable monitoring on a production server, log a call via the USC. This level of monitoring is provided as standard.

Storage Provisioning

Storage can be added to an existing virtual server already attached to the SAN. The space will be made available and left un-configured to the operating system. Instructions on how to configure the additional disk space is included in the End User Pack. Configuration of this additional space is the responsibility of the Customer. To request additional storage, log a request to the USC.

Data Backup

Each virtual machine is backed up on a weekly basis. The retention policy is currently two copies.

Tivoli Storage Manager (TSM) client software is installed on each virtual server by default and is configured to talk to the NUI Galway backup environment. This client allows for ad-hoc or scheduled backups of specific files and directories on your server. Backups of this kind are not enabled by default. If such file/directory type backups are required in addition to the DR provisions built into the infrastructure, please contact the User Support Centre.

Status reporting

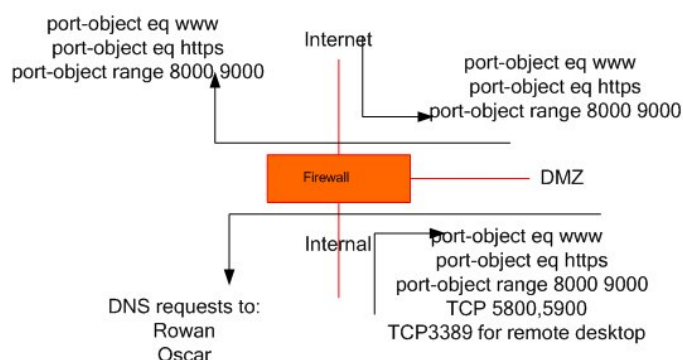
Standard System reports (Uptime of Server) can be provided by Computer Services operation team on request. Reports are only provided for production servers.

Anti-virus

Anti-virus EPO agent and McAfee is installed on all Windows Servers. All directories and files are scanned by default.

Firewall Ports

The following diagram shows the open ports for virtual servers hosted on the DMZ. If you require additional ports to be open, raise a Service Request ticket.



Additional Information on the Service

For additional information or answers to specific questions on the service, see below:

1. Primary contact - Conor McMahon, Head of Customer Services
2. Secondary Contacts – Andrew Butler, Head of Infrastructure Services; Maria Linnane, Senior Data Centre Specialist and Wesley Reilly, Data Centre Specialists

Contact details are at the following URL: http://www.nuigalway.ie/cs/about/cs_staff.html

How do I make a request?

Go online to <https://helpdesk.nuigalway.ie/helpdesk/WebObjects/Helpdesk> and open a service request ticket. All questions are mandatory and must be completed before request can be processed. You may contact the USC for assistance.

What is VMware?

<http://www.vmware.com/virtualization/>

How do I log a support call?

For issues arising with the virtual server environment that fall under the scope of the service, please contact the User Support Centre to open a ticket. Contact details are at the following URL:

<http://www.nuigalway.ie/cs/about/usc/uscintro.html>

Metrics Reporting

Regular reporting will be provided from Computer Services to the Customer on available metrics as related to target performance such as system up-time. Please indicate on the request form whether or not you wish to receive metrics.

Out of Scope Services

System Administration

Maintenance and operation of the virtual server OS and any installed applications is the sole responsibility of the customer.

The customer may avail of the optional 24*7 OS Monitoring and Maintenance Service. This service is available for Windows servers only. The scope of this optional service is clearly defined and are available in the Virtual Server and Storage Provisioning Service Level Agreement.

Security

Computer Services is responsible for the availability of underlying physical infrastructure on which the virtual server and storage systems are resident, however, Computer Services is not responsible for the integrity, availability and accessibility of server application or data resident on customer supported virtual server and associated storage. Computer Services is not responsible for OS or Anti virus updates and patches, unless the customer avails of the optional 24*7 OS Monitoring and Maintenance Service.

Databases

Internal databases maybe installed at any time by the customer according to application requirements, but this intention needs to be specified during set-up so that server resources are allocated correctly. Application access to external databases (databases not embedded with Virtual Server) is not supported at this time.

Licensing and procurement

OS or application software procurement, evaluation, testing and installation (other than base OS install); Application software licensing; Assistance or training in the usage of the OS or installed applications.

For information on Microsoft Software Licensing:

http://www.nuigalway.ie/cs/staff/software/software_mslicensing.html

Information on Software Funding policy:

http://www.nuigalway.ie/cs/downloads/university_support_for_software_licence_costs.pdf

Software Request Form:

http://www.nuigalway.ie/cs/staff/software/software_requests.html