

Xen

- [Xen](http://www.xen.org) `<http://www.xen.org>` is a virtualisation technology which scales well
 - one of the competing technologies which implements cloud computing
 - can be compared against KVM
- [what is Xen](http://www.xen.org/files/Marketing/WhatIsXen.pdf) `<http://www.xen.org/files/Marketing/WhatIsXen.pdf>`
- [why Xen](http://www.xen.org/files/Marketing/WhyXen.pdf) `<http://www.xen.org/files/Marketing/WhyXen.pdf>`

Xen terminology

- the machine `mcgreg-xen` is accessible from `mcgreg.comp.glam.ac.uk` and is known as a Dom0 (domain) hypervisor in Xen terminology
- your instances are known as DomU and are all running on the Dom0
 - you can start/stop delete/recreate your Dom0 instance

Xen provides

- us with the ability to host server side virtualisation
- you with full `root` access on your own DomU instance
- us with the ability to run 24 DomU instances on one Dom0 server
- you with the ability to access your Dom0 from anywhere on campus
 - works well with LTSP in any of the 2nd floor J block labs

Xen provides

- the advantages this gives are:
 - we can reproduce a Xen network configuration with little effort
 - the Xen network is available to all students from any of the G515 or J2xy laboratories
 - it all operates server side so your instance is running 24/7

- all persistent data (filesystem images) are held on the Xen server local hard disk
 - minimises network throughput requirements

- LTSP also operates server side thus making it an efficient way to interact with Xen

How to use Xen at Glam

- many of the Xen tools have been wrapped up to provide easy default access
 - one instance per GNU/Linux username
 - they also run with sufficient hypervisor privilege

- there are five basic new glam xen commands:
 - `xen-buildclient`, `xen-start`, `xen-stop`, `xen-console` and `xen-list`.

How to use Xen at Glam

- firstly [obtain an account on mcgreg](http://mcgreg.comp.glam.ac.uk/login.html) (`http://mcgreg.comp.glam.ac.uk/login.html`)
- boot a client into LTSP
 - LTSP has been installed in J203
- login and open up a command line terminal

How to use Xen at Glam

- ```
$ ssh -X mcgreg-xen
The authenticity of host 'mcgreg-xen (192.168.0.2)' can't be established.
RSA key fingerprint is 73:16:0d:0f:ca:56:fc:6a:b0:26:8c:f8:4f:ca:f8:29.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'mcgreg-xen' (RSA) to the list of known hosts.
fred@mcgreg-xen's password: yourlinuxpassword
```
- you are now logged into the Dom0 (mcgreg-xen)

## Creating a DomU instance

- consult the lecturer to ensure that you have been granted Xen access
- to create a new DomU instance use the command:

```
$ xen-buildclient
please be patient with this command, it will take a while to complete.

Choose a root password for this Xen instance:secret

Hostname : fred.example.org
Distribution : squeeze
IP-Address(es) : 192.168.0.3
```



## Creating a DomU instance

- this initialises a Debian Squeeze filesystem with minimal packages
  - your virtual machine has 1GB ram and 1GB harddisk
  
- it would be sensible to copy down the IP address allocated to your machine
  - in the previous case it was: 192.168.0.3

## Powering up your Xen DomU instance

- to simulate switching on your virtual machine (DomU instance), type:

- ```
$ xen-start
```

```
Using config file "/etc/xen/fred.example.org.cfg".
```

```
Started domain fred.example.org (id=6)
```

Powering down your Xen DomU instance

- it would be sensible to check your Xen instance is running by:

```
$ xen-list
```

- which should report a list of DomU instances on the left hand side, one of which should match your username

- to stop your Xen instance (switch off the computer), type:

```
$ xen-stop
```

- check it is no longer running, then restart your Xen instance

Console access to your DomU

- can be achieved by typing:

```
$ xen-console
INIT: Entering runlevel: 2
Using makefile-style concurrent boot in runlevel 2.
Starting enhanced syslogd: rsyslogd.
Starting OpenBSD Secure Shell server: sshd.
Starting periodic command scheduler: cron.

Debian GNU/Linux 6.0 fred hvc0

fred login: root
Password:secret
```

Console access to your DomU

- to disconnect your terminal from the xen console hold down the <ctrl> key and press]

- to reconnect type:

-

Installing packages on your Xen DomU

- install any packages you require via `apt-get`, for example

- ```
apt-get install --yes wireshark gedit
```

## Using a graphical tool under Xen

- open up another terminal on your desktop, and type:

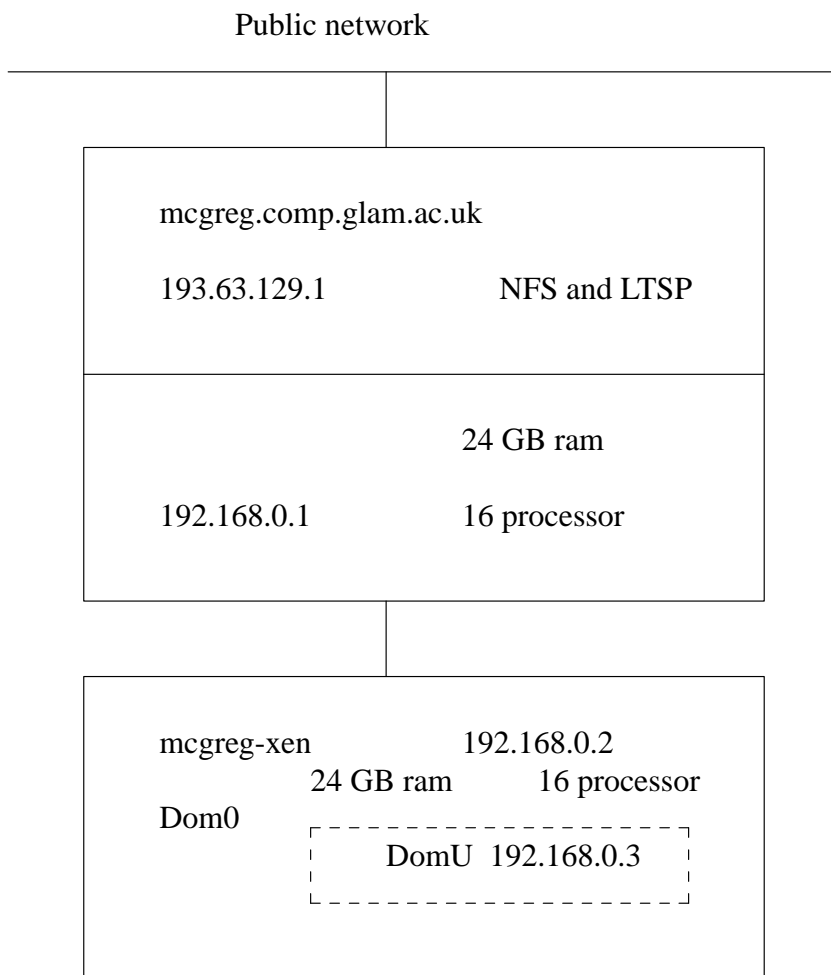
```
$ ssh -X mcgreg-xen
fred@mcgreg-xen's password: yourlinuxpassword
```

- suppose you were interested in running `wireshark`, then you type:

```
$ ssh -X root@192.168.0.3
root@192.168.0.3 password: secret
wireshark
```

- at this point the `wireshark` utility will create a window on your desktop

# Xen network at glam





## Further reading

- <http://runningxen.com/>