Oxford University Particle Physics Site Report

Pete Gronbech

Systems Manager

Physics Department Computing Services

- Physics department restructuring. Reduced staff involved in system management by one.
- E-Mail hubs
  - A lot of work done to simplify the system and reduce manpower requirements. Haven't had much effort available for anti-spam. Increased use of the Exchange Servers. Now making use of the Oxford University Computing Service Mail hubs to provide a SPAM score.
- Windows Terminal Servers
  - Still a popular service. More use of remote access to user's own desktops (XP only)
- Web / Database
  - A lot of work around supporting administration and teaching.
- Exchange Servers
  - Increased size of information store disks from 73-300GB.
- Windows Front End server – WINFE
  - Access to windows file system via SCP, SFTP or web browser
  - Access to exchange server (web and outlook)
  - Access to address lists (LDAP) for email, telephone
  - VPN service

Windows Status

- Systems are now almost entirely Windows XP on clients and Windows Server 2003 for services.
- Windows XP pro is default OS for new desktops and laptops.
- More machines brought into centrally managed domain.
- More automation of updates, vulnerability scans etc.
- More laptops to support

Grant year	Windows Desktops Installed	Minimum Spec	Maximum Spec	Laptops (individual)	Laptops (pool)
02/03	49	P4/2.0	P4/2.6	6+8	2
03/04	50	P4/2.6	P4/3.0	9	2
04/05	45	P4/3.0	P4/3.2	11	3

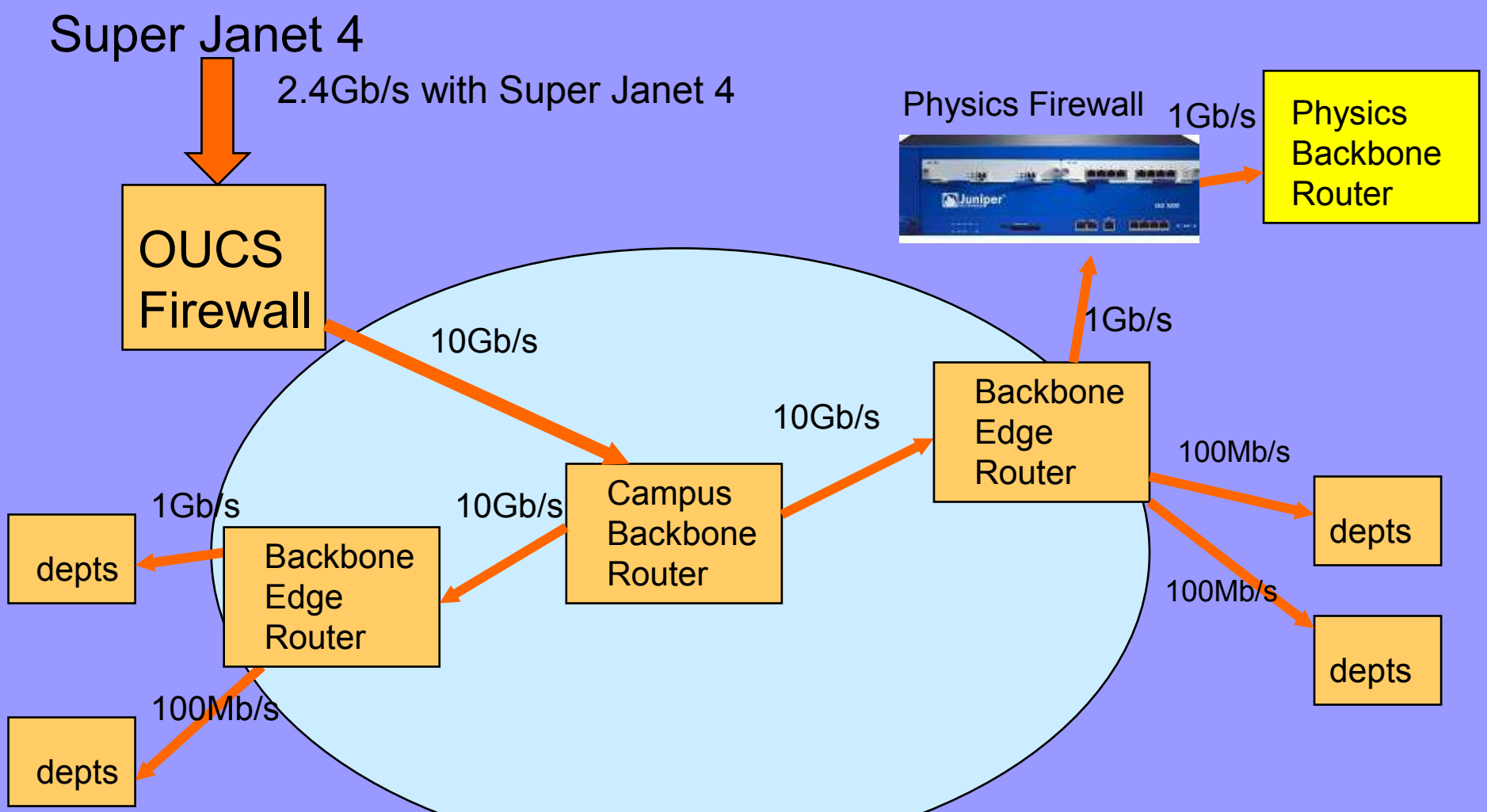
Software Licenses:

•Continued NAG deal (libraries only)
•New deal for Intel compilers run through OSC group
•Labview, Mathematica, Maple, IDL
•System management tools, for imaging, backup, anti-spyware
•MS OS's and Office covered by Campus select agreement

Network

- Gigabit connection to campus operational since July 2005. Several technical problems with the link delayed this by over half a year.
- Gigabit firewall installed. Purchased commercial unit to minimise manpower required for development and maintenance. Juniper ISG 1000 running netscreen.
- Firewall also supports NAT and VPN services which is allowing us to consolidate and simplify the network services.
- Moving to the firewall NAT has solved a number of problems we were having previously, including unreliability of videoconferencing connections.
- Physics-wide wireless network. Installed in DWB public rooms, Martin Wood and Theory. Will install same in AOPP. New firewall provides routing and security for this network.

Network Access

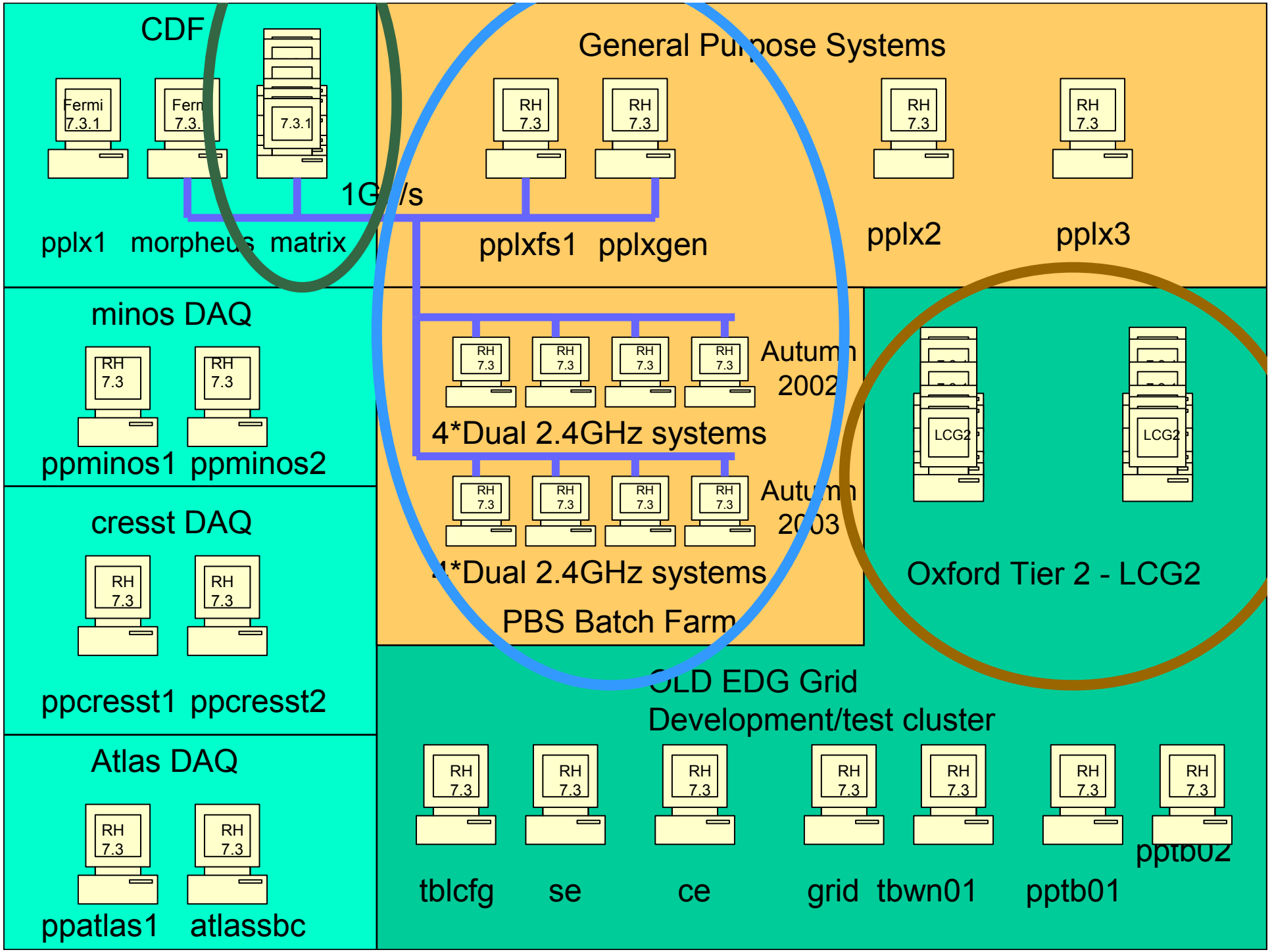


Network Security

- **Constantly under threat from vulnerability scans, worms and viruses. We are attacking the problem in several ways**
  - **Boundary Firewall's (but these don't solve the problem entirely as people bring infections in on laptops.) – new firewall**
  - **Keeping operating systems patched and properly configured - new windows update server**
  - **Antivirus on all systems – More use of Sophos but some problems**
  - **Spyware detection – anti-spyware software running on all centrally managed systems**
  - **Segmentation of the network into trusted and un-trusted sections – new firewall**
- **Strategy**
  - **Centrally manage as many machines as possible to ensure they are uptodate and secure – most windows machines moved into domain**
  - **Use Network Address Translation (NAT) service to separate centrally managed and `un-trusted` systems into different networks – new firewall plus new Virtual LANs**
  - **Continue to lock-down systems by invoking network policies. The client firewall in Windows XP –SP2 is very useful for excluding network based attacks – centralised client firewall policies**

Particle Physics Linux

- Aim to provide general purpose Linux based system for code development and testing and other Linux based applications.
- New Unix Admin (Rosario Esposito) has joined us, so we now have more effort to put into improving this system.
- New main server installed (ppslgen) running Scientific Linux (SL3)
- File server upgraded to SL4 and 6TB disk array added.
- Two dual processor worker nodes reclaimed from Atlas Barrel assembly and connected as SL3 worker nodes.
- RH7.3 worker nodes migrated to SL3
- Some performance problems with gnome (Solved by using fixed fonts) and SL3 from exceed. Evaluating alternative (NX) for exceed which doesn't exhibit this problem (also has better integrated ssl).
- Tested VMware player, on Windows Desktop, running a SL image, as a batch worker. It is possible but performance an issue.


CDF
Fermi 7.3.1
7.3.1
1G /s
pplx1
morpheus
matrix
General Purpose Systems
RH 7.3
pplxfs1
pplxgen
pplx2
pplx3
minos DAQ
ppminos1
ppminos2
Autumn 2002
4*Dual 2.4GHz systems
Autumn 2003
4*Dual 2.4GHz systems
PBS Batch Farm
LCG2
Oxford Tier 2 - LCG2
cresst DAQ
ppcresst1
ppcresst2
OLD EDG Grid
Development/test cluster
Atlas DAQ
ppatlas1
atlassbc
tblcfg
se
ce
grid
tbwn01
pptb01
pptb02

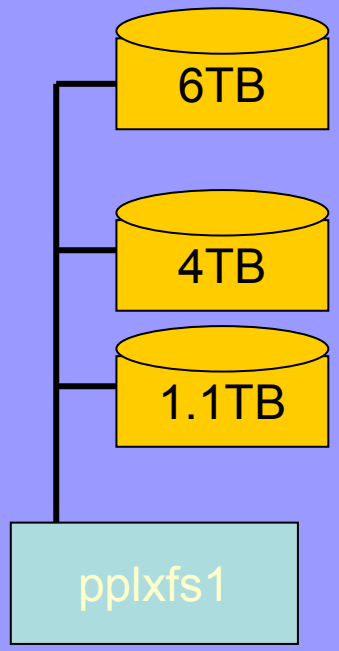
PP Linux Batch Farm (October05)

Migration to Scientific Linux

Red Hat 7.3

2 * 800MHz P3	pplx3
2 * 450MHz P3	pplx2
2 * 2.4GHz P4	pplxwn04
2 * 2.4GHz P4	pplxwn03
2 * 2.4GHz P4	pplxwn02
2 * 2.4GHz P4	pplxwn01
2 * 2.2GHz P4	pplxgen

Addition of New 6TB SATA RAID Array



2 * 1GHz P3
File Server

Scientific Linux 3

pplxwn11	2 * 2.8GHz P4
pplxwn10	2 * 2.8GHz P4
pplxwn09	1 * 2.4GHz P4
pplxwn08	2 * 2.4GHz P4
pplxwn07	2 * 2.4GHz P4
pplxwn06	2 * 2.4GHz P4
ppslgen	2 * 2.4GHz P4
pplxwn05	8 * 700MHz P3

PP Linux Batch Farm (Dec 05)

Migration to Scientific Linux

Red Hat 7.3

2 * 800MHz P3 — pplx3

Addition of New 6TB SATA RAID Array

6TB

4TB

1.1TB

2 * 2.2GHz P4 — pplxgen

pplxfs1

2 * 1GHz P3
File Server

Scientific Linux 3

pplxwn17	2 * 2.8GHz P4
pplxwn16	2 * 2.0GHz P4
pplxwn15	2 * 2.0GHz P4
pplxwn14	2 * 2.0GHz P4
pplxwn13	2 * 2.0GHz P4
pplxwn12	2 * 2.0GHz P4
pplxwn11	2 * 2.8GHz P4
pplxwn10	2 * 2.8GHz P4
pplxwn09	1 * 2.4GHz P4
pplxwn08	2 * 2.4GHz P4
pplxwn07	2 * 2.4GHz P4
pplxwn06	2 * 2.4GHz P4
pplxwn04	2 * 2.4GHz P4
pplxwn03	2 * 2.4GHz P4
pplxwn02	2 * 2.4GHz P4
pplxwn01	2 * 2.4GHz P4
ppslgen	2 * 2.4GHz P4
pplxwn05	8 * 700MHz P3
pplx2	2 * 450MHz P3

Particle Physics General Purpose Linux Servers : pplxgen & ppslgen

ppslgen is a dual 2.4GHz Xeon system with 4GB RAM and runs SL3.0.4.
It replaces….

pplxgen is a Dual 2.2GHz Pentium 4 Xeon based system with 4GB ram. It is running SL3.0.5
It was brought on line at the end of August 2002.

Provides interactive login facilities for code development and test jobs. Long jobs should be sent to the batch queues.

New Dual (Dual Core) system to be added shortly.

Particle Physics General Purpose Batch Farm

PP batch farm now running SL3 with Torque (the replacement for Open PBS) can be seen below pplxgen

This service became fully operational in Feb 2003. Additional 4 worker nodes were installed in October 2003. These are 1U servers and are mounted at the top of the rack.

Currently a total of 39 cpu's available to ppslgen/torque.

Particle Physics: Data Storage

The Linux File Server: pplxfs1
Dual 1GHz PIII, 1GB RAM

The original 1.1TB of SCSI disks have been supplemented by a new Eonstor SATA RAID array added in April 04. 16* 250GB disks gives approx 4TB , and another in Sept 05 with 16*400GB disks about 6TB.

CDF Linux Systems

Purchased as part of a JIF grant
for the CDF group.
IBM x370 8way 700MHz Xeon server
with 8GB RAM
and 1TB Fibre Channel Disks

11 Dell 2.4GHz P4 Xeon servers with
9TB SCSI Disks

Runs CDF software developed at
Fermilab and Oxford to process data
from the CDF experiment.

CDF kit is now 3 years old,
the servers that were at RAL
have been shared among the four
universities. Oxford share
IBM x370 8 way SMP 700MHz Xeon
5 disk shelves (~3.3TB)
6 Dual 1GHz PIII servers

Oxford Tier 2 centre for LHC

Two racks each containing 20 Dell dual 2.8GHz Xeon's with SCSI system disks.

1.6TB SCSI disk array in each rack.

Systems are loaded with LCG software version 2.7.0.

The systems have been heavily used by the LHCb, ATLAS and Biomed Data Challenges.

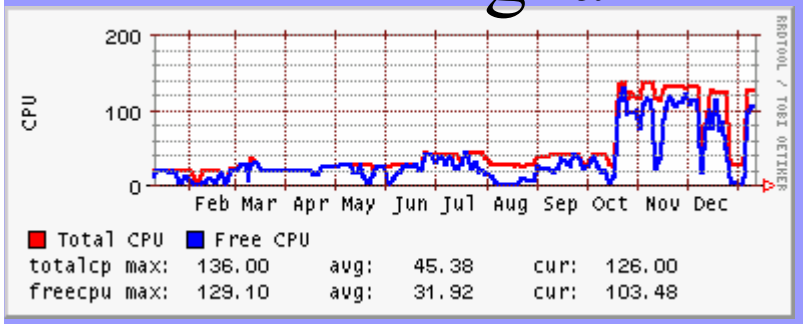
Network Monitoring Box installed and working

5 SouthGrid Testzone machines added for pre release testing.

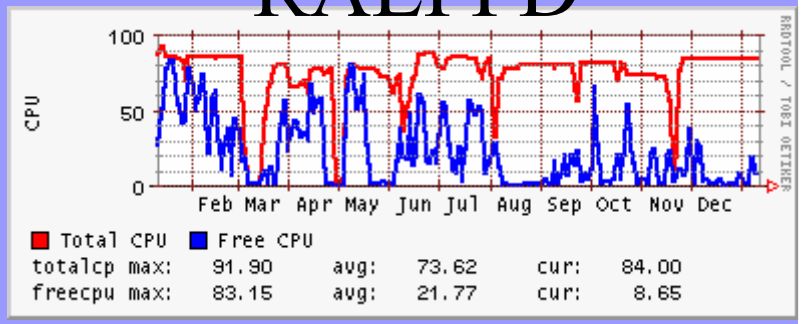
GridPP UK Computing for Particle Physics

SouthGrid Utilization 2005

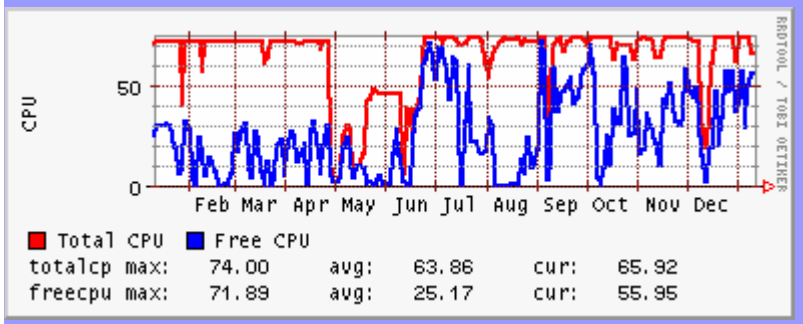
Birmingham



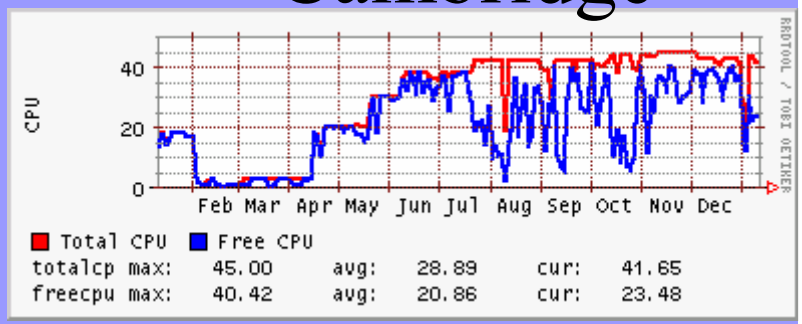
RALPPD



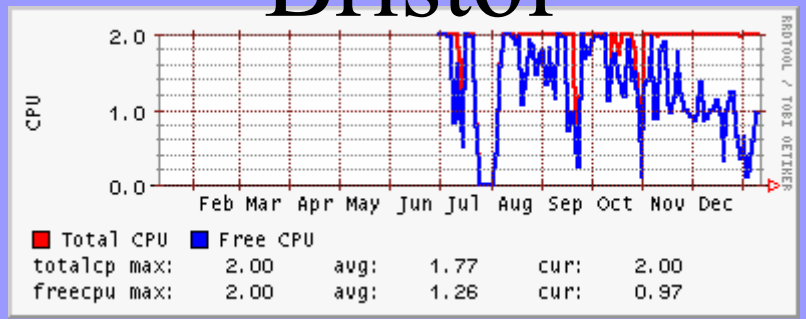
Oxford



Cambridge



Bristol



Oxford Computer Room

- Modern processors take a lot of power and generate a lot of heat.
- We've had many problems with air conditioning units and a power trip.
- Need new, properly designed and constructed computer room to deal with increasing requirements.
- Local work on the design and the Design Office has checked the cooling and air flow.
- Plan is to use one of the old target rooms on level 1, for physics and the new Oxford Supercomputer (800 nodes).
- Requirements call for power and cooling between of 0.5 and 1MW
- SRIF funding has been secured but this now means its all in the hands of the University's estates. Now unlikely to be ready before ….

Level 1 Computer Room??

Last Year you saw th
space we could use.

There are now 5 rack
of computers located
here.

Bad News:
No Air Conditioning
Room also used as a store
Conversion of Room
is taking time…But

SRIF Funding secured
to build joint room for
Physics and OSC

Tier 2 Rack 2, Clarendon, Oxford grid development, and Ex RAL CDF IBM 8 way

Future Plans/Upgrades 2005-2006

- Networking
  - Increase the gigabit infrastructure
  - Segmenting Network to manage untrusted machines
- Windows
  - Server Consolidation
  - Migration of all windows to single physics authentication domain
- General PP
  - Increased disk storage
  - Better interactive machines (to supplement pplxgen) Dual dual core Opteron?
  - Scientific Linux on all systems migrate to SL4 in Autumn to match CERN and LCG/glite software
- Tier 2
  - Similar spend (£70k)2005 +(£70K)2006 delayed until room ready
  - Already suffering as a result of cooking our kit, 7 psu failures, 4 UPS battery failures and 2 Hard Disk failures in last 4 months.