

# Durham

2 July 2009

- **New Cluster (Dec 2008)**

- 42 x Supermicro Twins

- 672 Job Slots (> 1M SpecInt2k)

- Dual processor, quad core (2.66GHz) providing 8 cores per machine.

- Low-power Xeon L5430 for greater power efficiency and lower running costs.

- 16GB RAM per machine, providing 2GB per core.

- Dual bonded gigabit ethernet

- 0.5TB Hard Disk

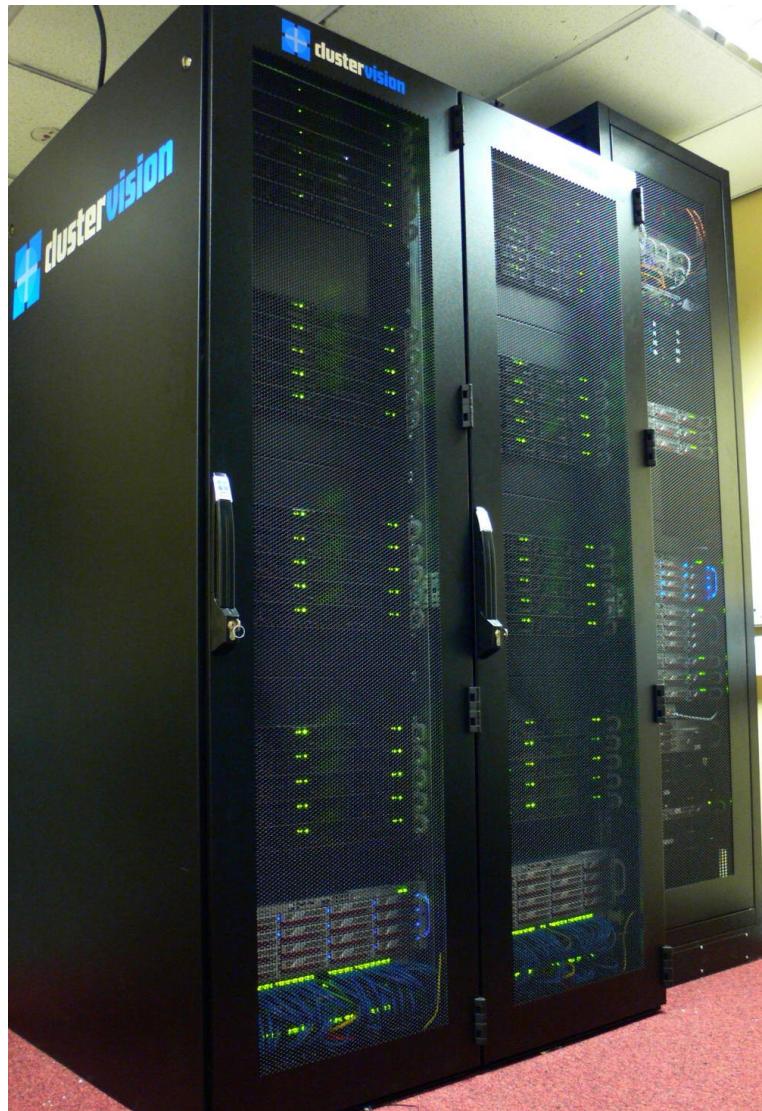
- **Storage**

- DPM head node running as a VM

- 35TB over 3 x 16 Bay Storage Servers

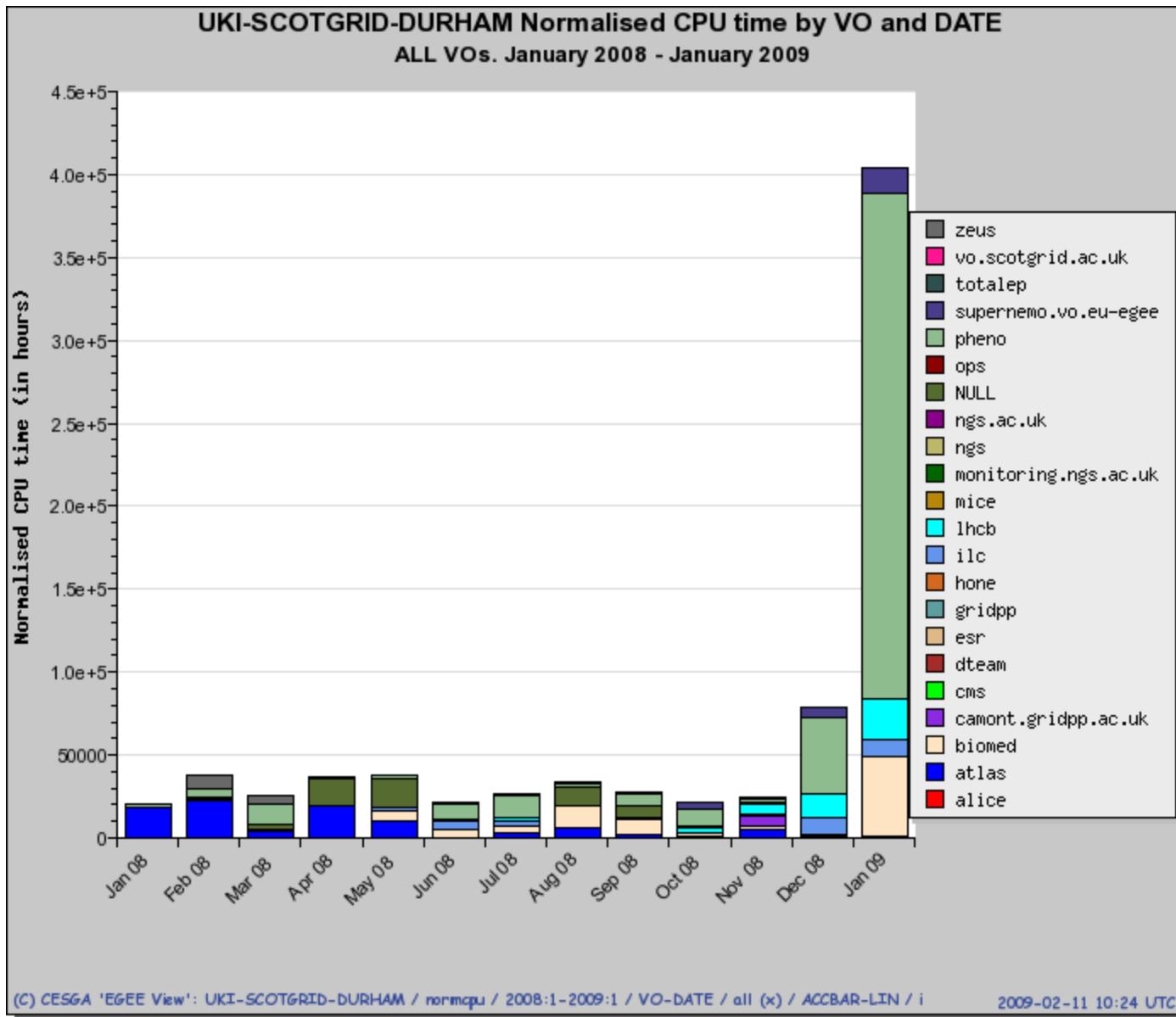
- XFS filesystem

- Dual bonded gigabit ethernet





# Increased Resources



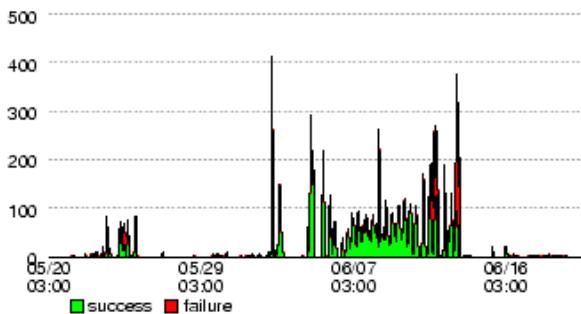
# STEP 09



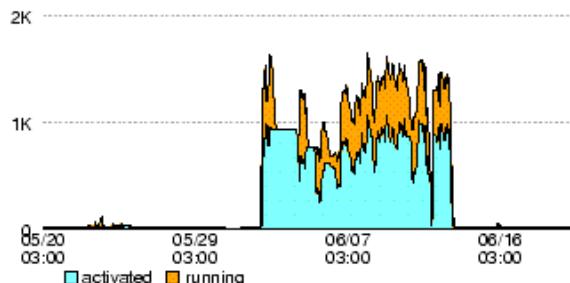
**GridPP**  
UK Computing for Particle Physics

2009-05-20 03:00:00 — 2009-06-20 15:59:59

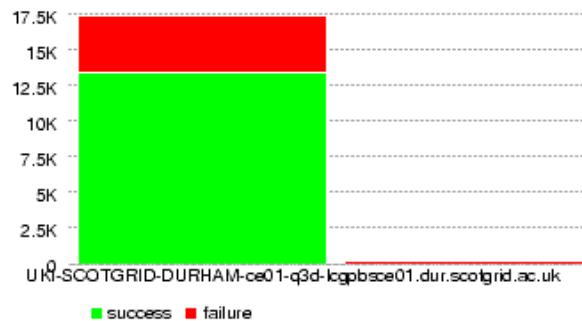
jobs



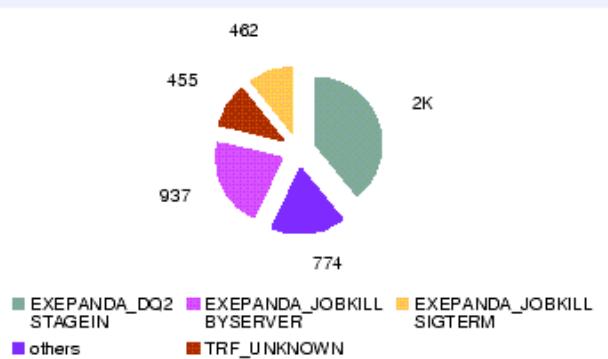
queued jobs



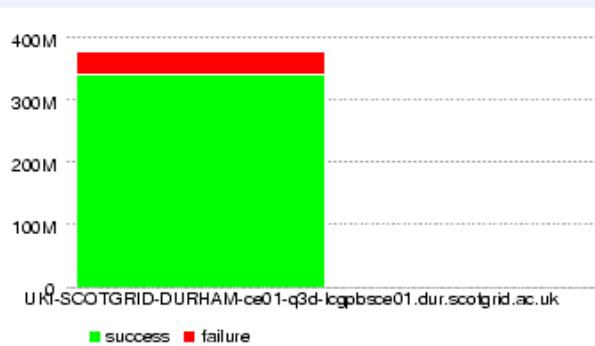
jobs



errors (jobs)



walltime (seconds)



cluster	defined	assigned	waiting	activated	running	holding	transferring	success	failure	efficiency
UKI-SCOTGRID-DURHAM-ce01-q3d-lcgpbs	0	0	0	0	0	1	0	13363	4081	76.6%



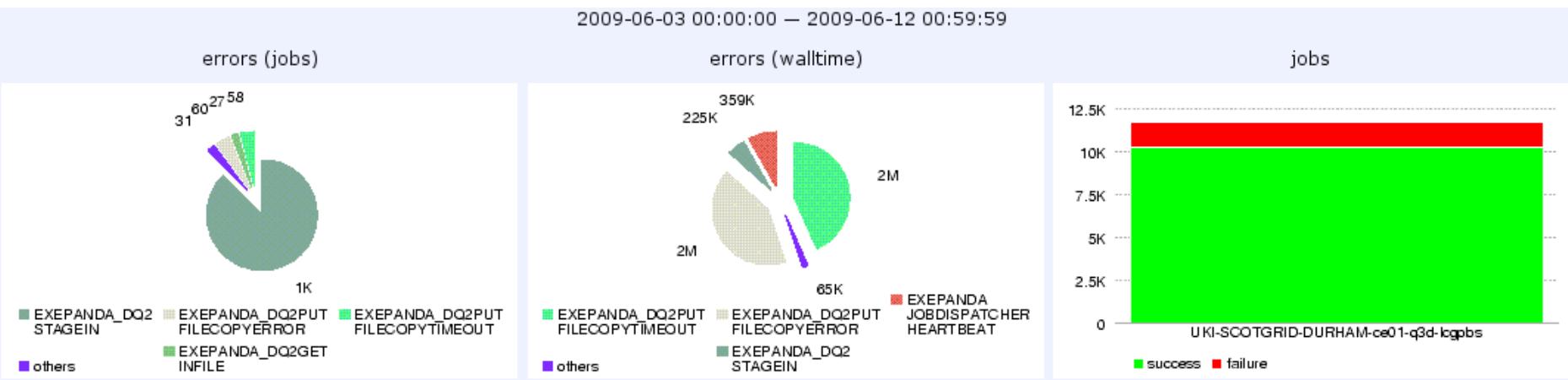
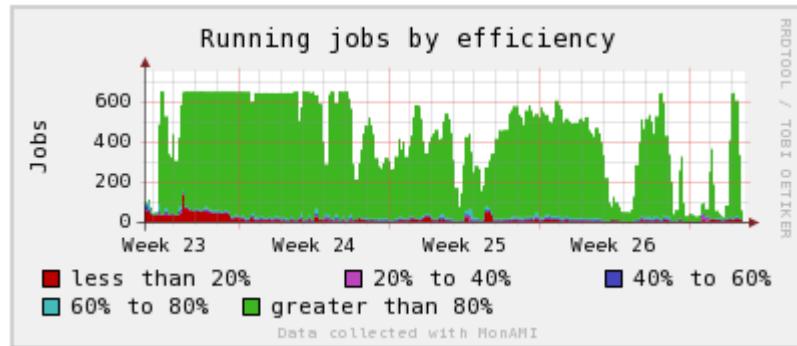
- Hammercloud - saturated network
  - torque/maui issues sending multiple jobs to the same node and cpu
  - Jobs would be blocked until previous job finished on that node
  - STEP09 jobs lost heartbeat or were killed

# STEP 09



**GridPP**  
UK Computing for Particle Physics

- Stopped hammercloud
- Main failure during stagein
- STEP09 jobs that did run were very efficient



restrict to: EXEPANDA\_DQ2\_STAGEIN (1247), EXEPANDA\_DQ2PUT\_FILECOPYERROR (60), EXEPANDA\_DQ2PUT\_FILECOPYTIMEOUT (58),

cluster

1

2

3

others

UKI-SCOTGRID-DURHAM-ce01-q3d-lcpbs (1423)

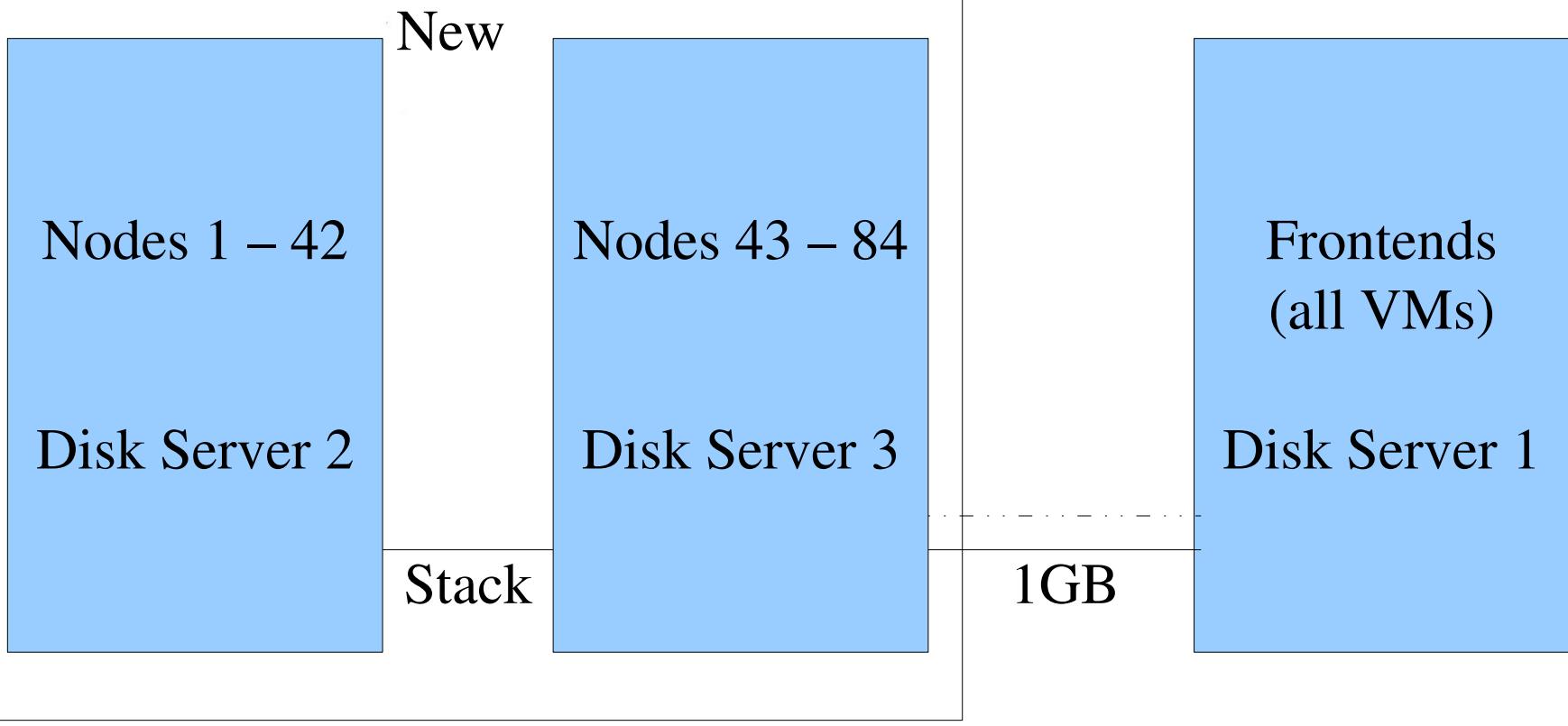
EXEPAND...\_STAGEIN (1247)

EXEPAND...OPYERROR (60)

EXEPAND...YTIMEOUT (58)

others (58)

# Infrastructure



- Hammercloud saturated the 1GB link
- Improvements to be made during next downtime

# Virtualisation



The screenshot displays two separate VMware Infrastructure Web Access interfaces. The left interface shows the inventory of the host `grid-vhost1.dur.scotgrid.ac.uk`, which contains several virtual machines named `bdii`, `ce01`, `ce02`, `ganglia`, `installhost`, `mon`, `se01`, and `torque`. The right interface shows the inventory of the host `grid-vhost2.dur.scotgrid.ac.uk`, also containing the same set of virtual machines. Both interfaces have a top navigation bar with tabs for Application, Virtual Machine, and Administration, along with standard window control buttons.

**grid-vhost1.dur.scotgrid.ac.uk**

**grid-vhost2.dur.scotgrid.ac.uk**

General	Value
Hostname	grid-vhost2.dur.scotgrid.ac.uk
Manufacturer	Supermicro
Model	X7DWU
Processors	Intel(R) Xeon(R) CPU E5420 @ 2.50GHz 2 CPUs x 4 Cores
Usage	2375.00 MHz
Memory	15.71 GB Usage: 1443 MB

2 x Host machines running VMWare Server

Dual processor, quad core Xeon E5420 providing 8 cores per machine.

Every grid front end running as a virtual machine (except the ui)

Older RAID system redeployed as shared storage (2TB)

Allows VMs to be powered up on either host



- Time - `ntp.conf` needs tweaking for VM use
  - Also dependent on interrupt time of host kernel
- I/O - main problem with virtualisation
- Could not deploy ESXi - h/w not supported
- Single point of failure if shared storage fails
- Backup - how to backup underlying VMDK files?

but...

- benefits outweigh the potential issues

# Bandwidth Monitoring



**GridPP**  
UK Computing for Particle Physics

- Simple iptables rule to count size of traffic to external IPs only

```
iptables -A INPUT -s ! 129.234.0.0/16 -j INBOUND  
iptables -A OUTPUT -d ! 129.234.0.0/16 -j OUTBOUND
```

- Cron script to take the byte counters

```
iptables -vxnl INBOUND -Z INBOUND  
iptables -vxnl OUTBOUND -Z OUTBOUND
```

