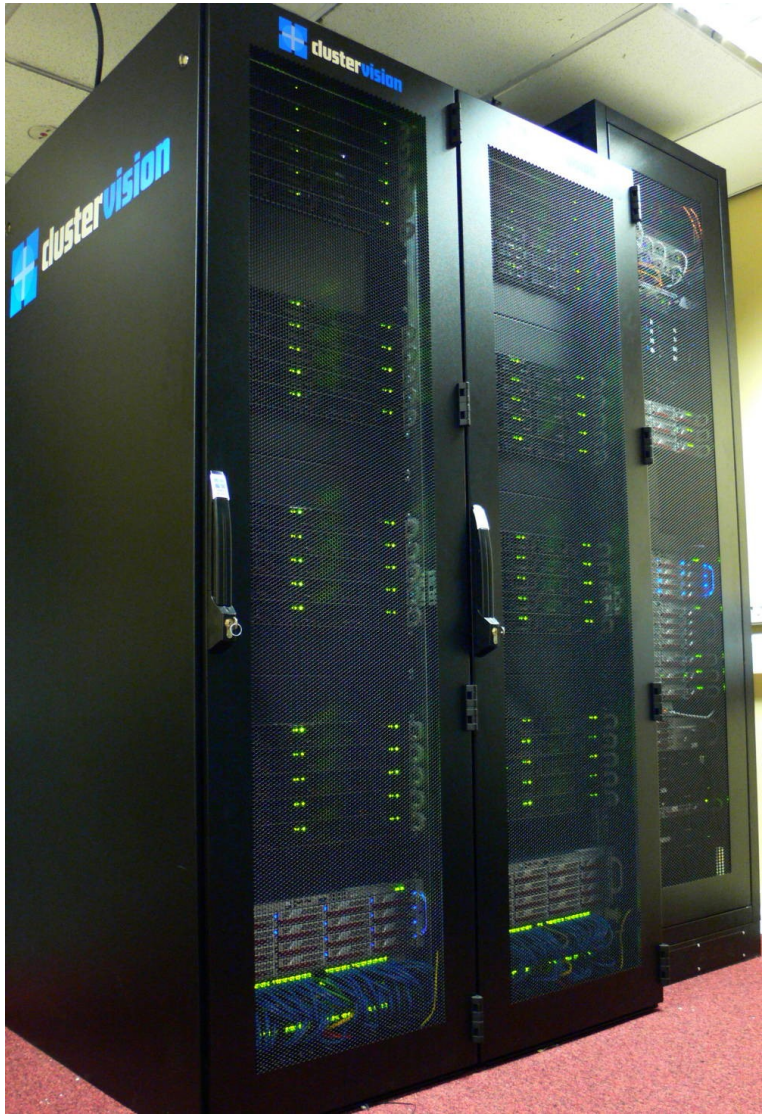
Durham

2 July 2009

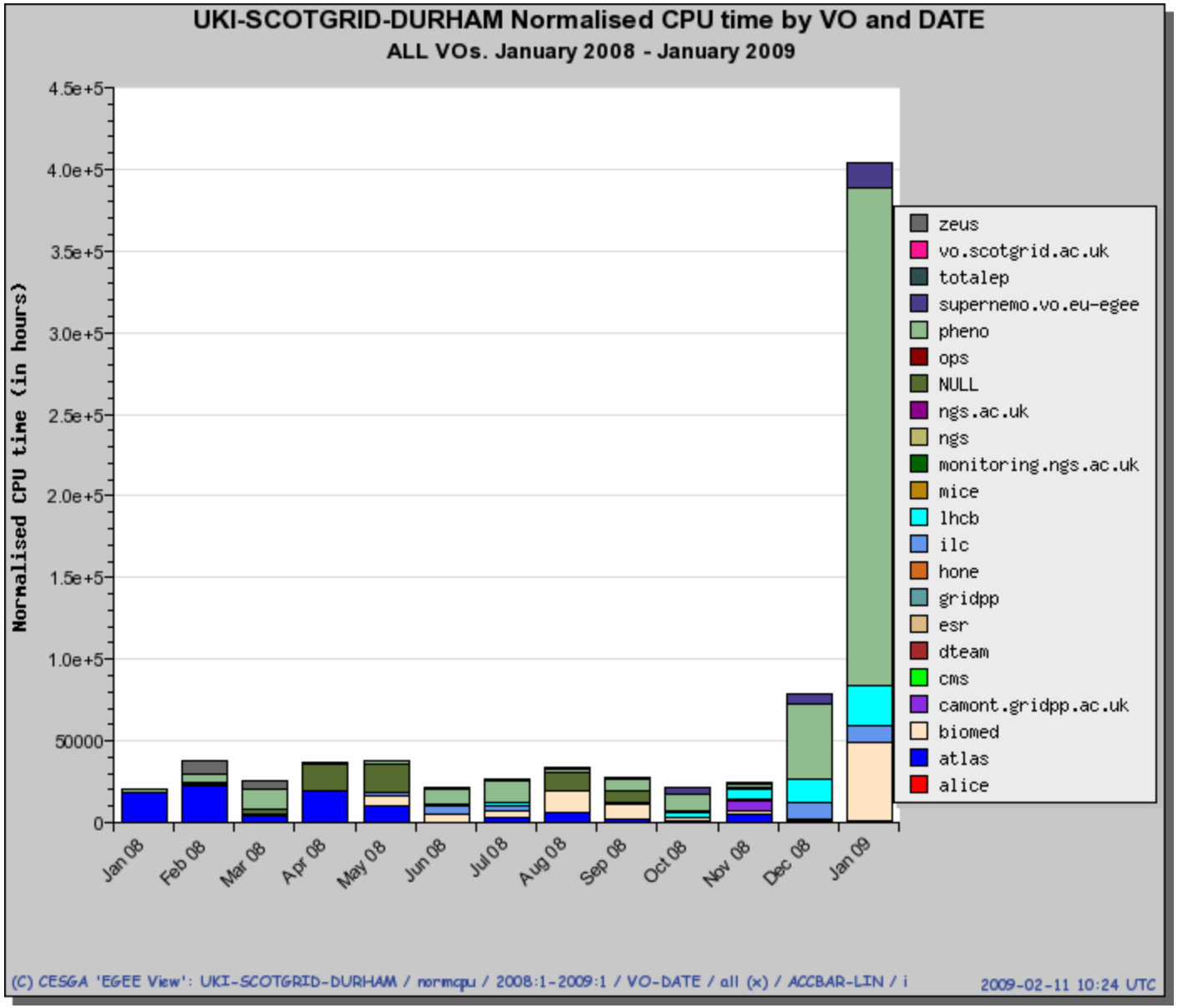
Durham

GridPP
UK Computing for Particle Physics

- **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

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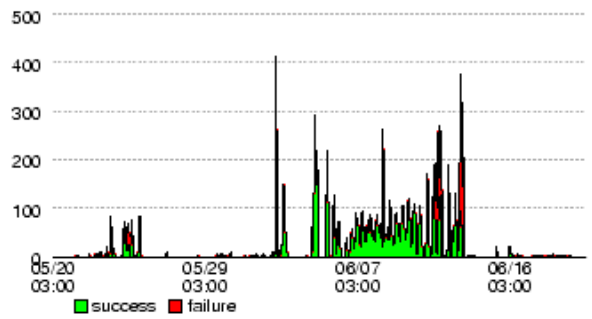
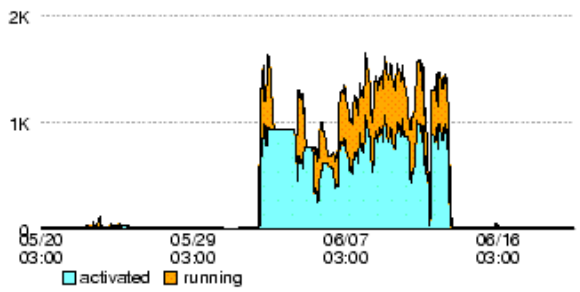
2009-05-20 03:00:00 — 2009-06-20 15:59:59

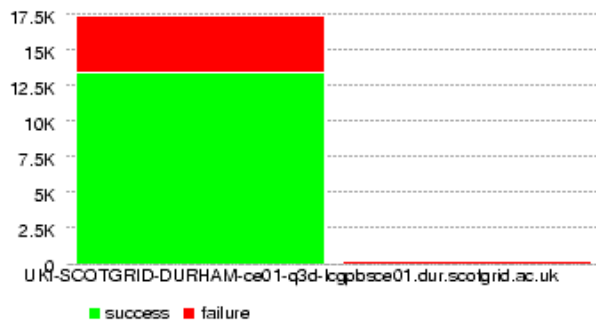
jobs



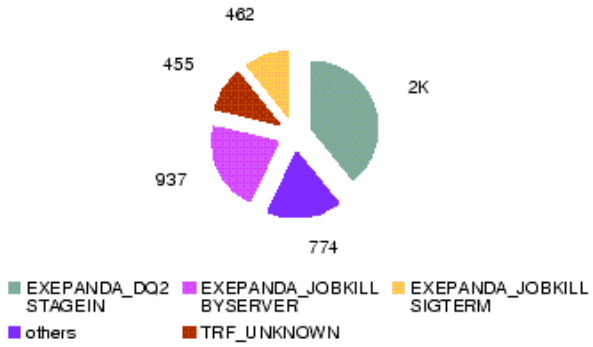
queued jobs



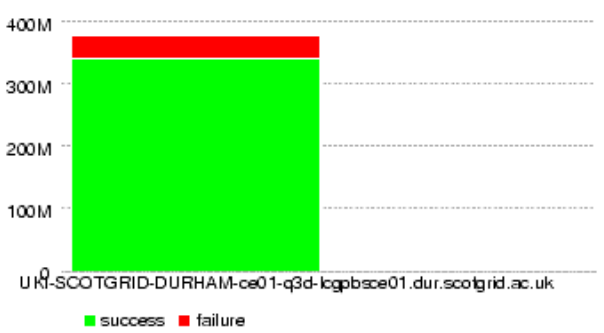
jobs



errors (jobs)

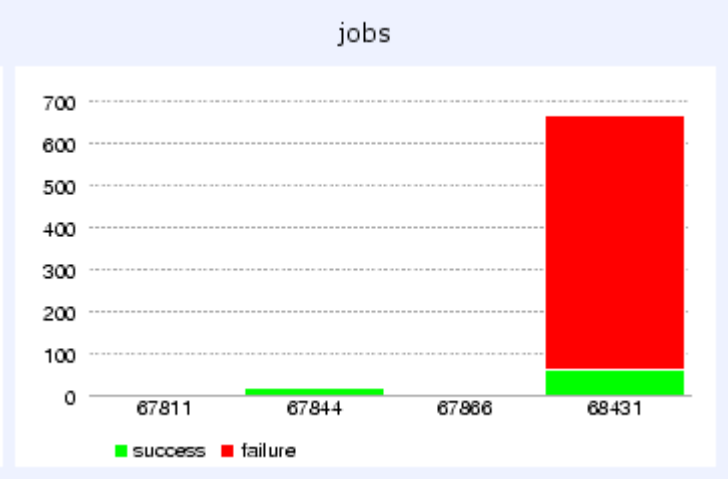


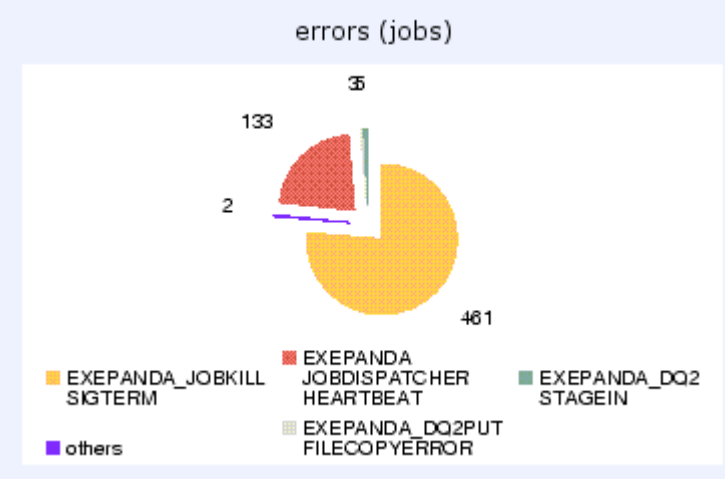
walltime (seconds)



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%

STEP 09

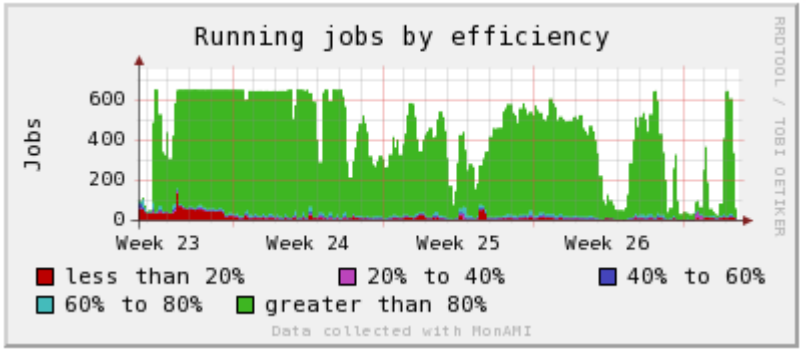


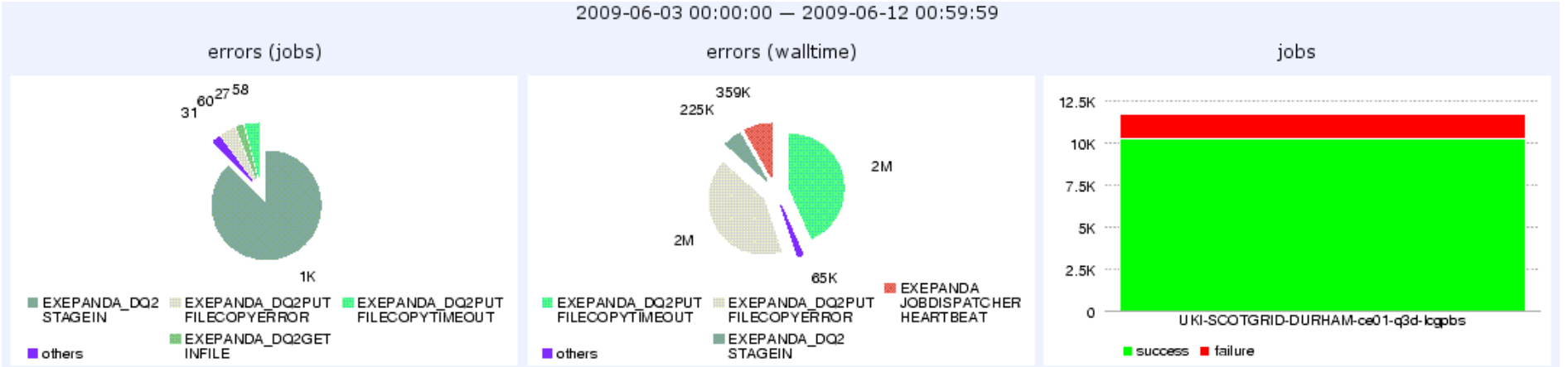


- Hammercloud – saturated network
  - torque/maui issues sending multiple jobs to the same node and cpu
  - Jobs would be blocked until previous job finished on that node
  - STEP09 jobs lost heartbeat or were killed

STEP 09

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

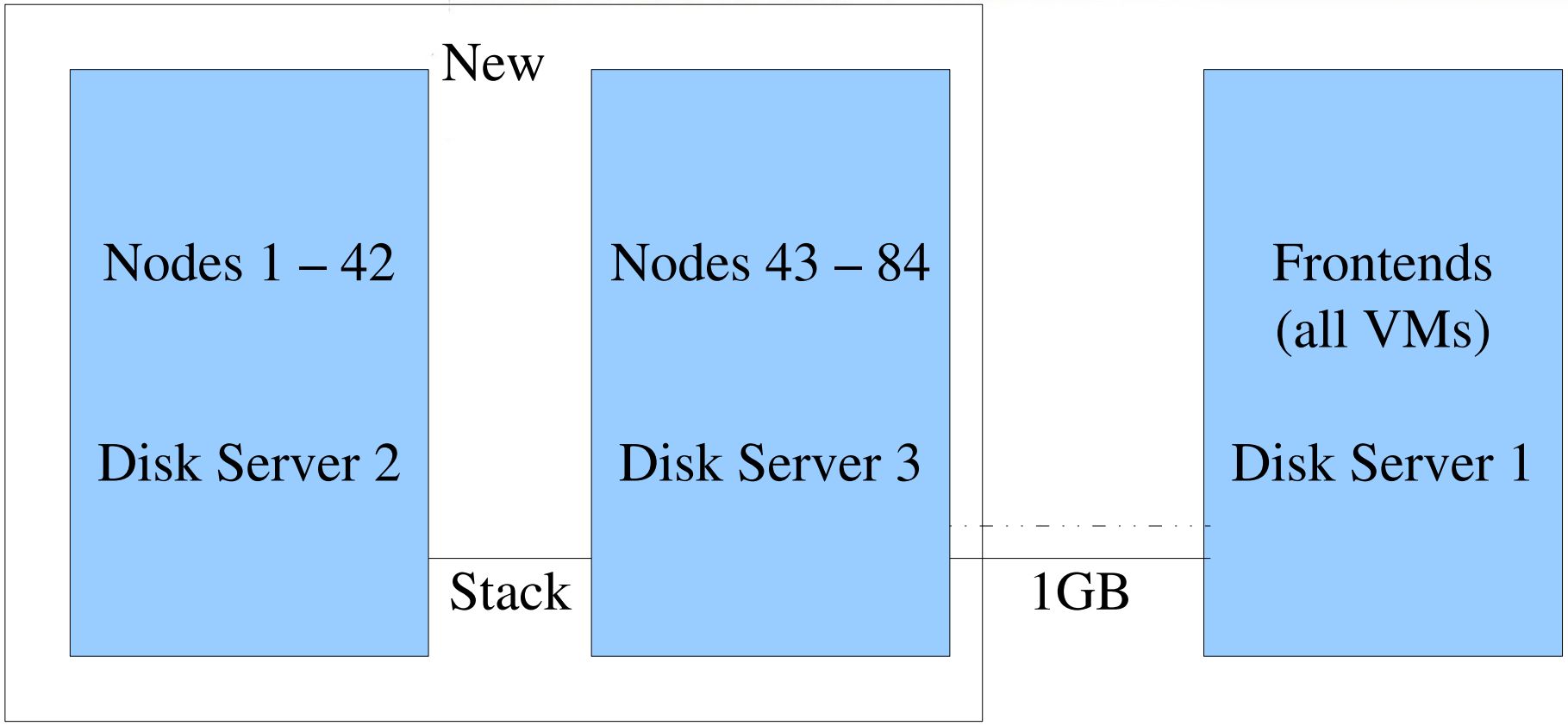




restrict to: EXEPANDA_DQ2_STAGEIN (1247), EXEPANDA_DQ2PUT_FILECOPYERROR (60), EXEPANDA_DQ2PUT_FILECOPYTIMEOUT (58),

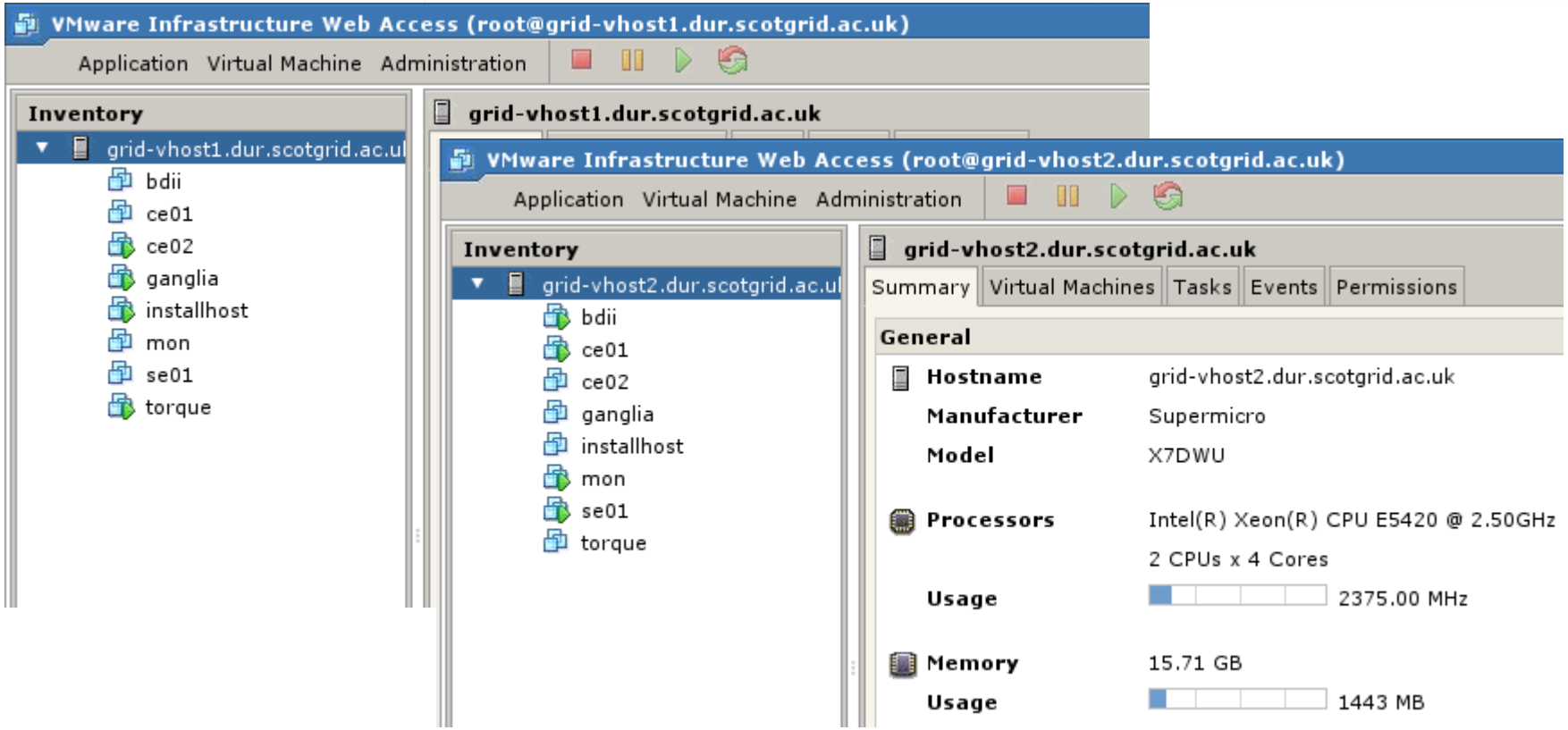
cluster	*1*	*2*	*3*	*others*
× UKI-SCOTGRID-DURHAM-ce01-q3d-lcgpbs (1423)	EXEPAND..._STAGEIN (1247)	EXEPAND...OPYERROR (60)	EXEPAND...YTIMEOUT (58)	others (58)

Infrastructure



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

Virtualisation



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

Virtualisation Issues

- 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

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- 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
```