

GridPP

UK Computing for Particle Physics

Oxford Site Report HEPSYSMAN

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June 22nd 2016



Current capacity
6000HS06 680TB

- Almost exclusively SL6 now.
- New procurement summer 2015.
- 4 Supermicro twin squared CPU boxes provide 256CPU physical cores
- Chose Intel E5-2630v3's should provide approx. ~4400 HS06 upgrade.
- Storage from Lenovo.
 - 1 U server with two disk shelves, containing 12 * 4TB SAS disks.
 - Provided an increased capacity of ~350TB
 - ~88TB for NFS and the rest for Lustre



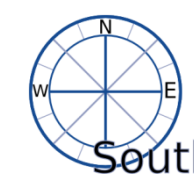


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2016

Dell	Dell	Viglen	Viglen	Viglen	Viglen	Dell
	Force10 S4810	t2switch201	t2switch04	t2switch201		Force10 S4810
		t2software02			3com	
		t2delltest				
		gridppnagios			t2ps-latency	
		t2lxvm02	t2wn3 t2wn4	t2wn1 t2wn2	t2ps-bandwidth	t2virhost2
						t2virhost1
		t2wn86 t2wn87	t2wn92 t2wn93 t2wn94 t2wn95	t2wn96 t2wn97 t2wn98 t2wn99	t2wn38 t2wn36 exPP	t2virtstore2
	t2se33	t2wn84 t2wn85	t2wn88 t2wn89 t2wn90 t2wn91		t2wn35 t2wn34 exPP	t2wn5 t2wn6
t2wn108-111	t2se32	t2wn82 t2wn83		t2wn60 t2wn61	t2wn33 t2wn32 exPP	t2wn7 t2wn8
t2wn104-107	t2se31	t2wn80 t2wn81	t2wn48 t2wn49	t2wn58 t2wn59	t2wn31 t2wn30 exPP	t2virtengine
	t2se30	t2wn78 t2wn79	t2wn46 t2wn47	t2wn56 t2wn57		t2se01
t2wn100-103	t2se29	t2wn76 t2wn77	t2wn44 t2wn45 currently t2ce04	t2wn54 t2wn55		t2se39
						t2se40
	t2se28	t2wn74 t2wn75	t2wn42 t2wn43	t2wn52 t2wn53		t2se41
t2se53		t2wn72 t2wn73	t2wn40 t2wn41	t2wn50 t2wn51		Dell UPS
t2se52	t2se27	t2wn70 t2wn71	t2wn26-27 ex PP		t2wn22 t2wn23 t2wn24 t2wn25	t2se34
t2se51	t2se26		t2wn28-29 ex pp			t2se35
t2se50	t2se25	t2wn68 t2wn69			t2wn18 t2wn19 t2wn20 t2wn21	t2se36
t2se49						t2se37
t2se48	t2se24	t2wn66 t2wn67			t2wn14 t2wn15 t2wn16 t2wn17	t2se38
t2se47						
t2se46	t2se23	t2wn64 t2wn65			t2wn10 t2wn11 t2wn12 t2wn13	
t2se45						
t2se44	t2se22	t2wn62 t2wn63			t2se19	



Supplier	Date	Warranty expires	WN CPU
Dell	2004	2007	
Viglen	Aug2007	2010	Intel 5345
Viglen	Sep 2008	2011	Intel 5420
Viglen	Nov 2010	2014	AMD 6128
Dell	May 2011	2016	Intel 5650
Dell	Q1 2012	2017	AMD 6276
Dell	Jan 2014	2019	
Viglen	Mar 2014	2019	Intel 2650v2



GridPP4 status
Autumn 2015

Current capacity
16,768HS06 980TB

- DPM Storage older Supermicro 26, 24 and 36 bay servers decommissioned, so capacity is provided by Dell 510 and 710s. 12 bay with 2 or 4 TB disks.
- Majority of CPU nodes are ‘twin-squared’ Viglen Supermicro worker nodes have been installed. Intel E5- 8 core (16 Hyper-threaded cores each) provides 1300 job slots with 2GB RAM.
- The majority of the Grid Cluster runs HT Condor behind an ARC CE.
- (Some viab nodes ~88 cores)



Decommissioning old storage



17 Supermicro servers removed from the DPM SE.
(Reduction of 320TB new total 980TB)





Old servers removed,
switched off or repurposed

Software up to date

OS up to date

Simplified ✓

- CPU

- GridPP4+ h/w money spent on CPU. This rack is identical to the kit used by Oxford Advanced Research Computing.
 - Initial plan is to plug into our Condor Batch as WNs
 - When staff levels and time allows, we will investigate integrating the rack into the ARC cluster.

Lenovo NeXtScale

25 Nodes each with Dual E5-2640 v3
& 64GB RAM

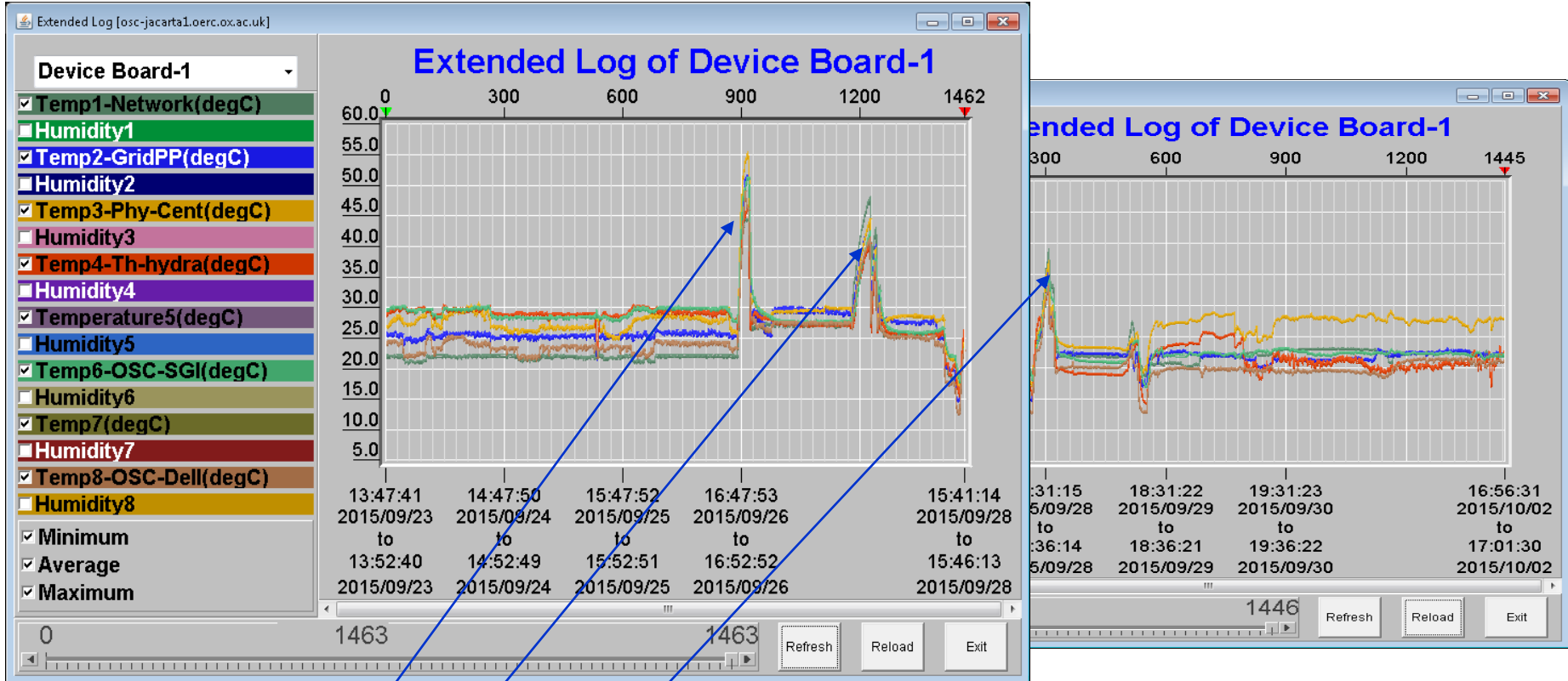
800 new cores (new total ~2200)





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Saturday 16:19 Sept 26th 2015

Sunday 16:13

Monday 17:04

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- People came into site or remotely switched off clusters very quickly.
- Building Services reset the A/C in 1-2 hours on both weekend days.
- The bulk of the load comes from University and Physics HPC clusters, but it turns out some critical University Financial services were also being run on this site.
- The incident was taken seriously and backup system ordered on Tuesday morning and installed from 10pm to 2am that night.
- Provides ~100KW back up in case of further trips. Normal load is ~230KW so main clusters were restricted.



- Pressurization unit had two faults, both repaired. New improved unit to be installed on Monday.
- A 200KW computing load will heat up very very quickly when the A/C fails.
- It always seems to do this out of hours. You need to react to this very quickly.
- Really needs to be automated, even fast response from staff not fast enough.
- Even risk mitigation has it's own risks.



- Unfortunately a thunder storm on Sunday 12th June 2016 caused a large brown out at the Begbroke site.
- This caused some pumps to switch off.
- Pattern was very similar to last time, Physics and ARC staff alerted first by our monitoring.
- Too long before building services got to site.
- Still work to be done to improve this sort of call out.

- **Local Cluster**
 - 2015 Local Cluster upgrade went well now need to plan and purchase 2016 upgrade.
 - Recruitment on going.
- **Grid Cluster**
 - A time of streamlining and rationalisation.
 - Still a lot of work to do, to investigate integrating with university resources.
 - Will this be possible, will it save time, or allow bursting to greater resources?
 - Possibly benefits of cost savings on h/w maintenance and electricity costs.
- **A/C problems**
 - Need faster response from Building Services
 - Need auto shutdown of systems

