

GridPP

UK Computing for Particle Physics

IPv6 in GridPP

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Estimating IPv6 & DNSSEC External Service Deployment Status

[NIST IPv6 and DNSSEC Deployment Monitor](#)

- Detailed IPv6 & DNSSEC Service Interface Statistics for 20140207 -

Domain	Organization	DNS	Mail	Web
uk.ac.stfc.	RAL	[4] 1/1/1 [M]	[4] 0/0/0 [0]	[1] 0/0/0 [I]
uk.ac.brunel.	Brunel University	[5] 2/1/2 [M]	[4] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.imperial.	Imperial College London	[4] 3/3/3 [P]	[4] 4/4/0 [P]	[1] 1/1/1 [I]
uk.ac.qmul.	Queen Mary University of London	[4] 0/0/0 [P]	[2] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.rhul.	Royal Holloway University of London	[2] 0/0/0 [I]	[3] 0/0/0 [0]	[1] 0/0/0 [I]
uk.ac.ucl.	University College London	[4] 1/1/1 [M]	[6] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.lancs.	University of Lancaster	[2] 0/0/0 [I]	[5] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.liv.	University of Liverpool	[4] 0/0/0 [M]	[2] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.manchester.	University of Manchester	[4] 1/1/1 [M]	[2] 0/0/0 [I]	[1] 0/0/0 [P]
uk.ac.shef.	University of Sheffield	[3] 2/2/2 [M]	[5] 4/4/0 [0]	[1] 0/0/0 [I]
uk.ac.dur.	University of Durham	[4] 1/1/1 [M]	[4] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.ed.	University of Edinburgh	[6] 0/0/0 [I]	[3] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.gla.	University of Glasgow	[3] 0/0/0 [I]	[2] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.bham.	University of Birmingham	[2] 0/0/0 [I]	[6] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.bris.	University of Bristol	[3] 1/1/1 [M]	[4] 0/0/0 [0]	[1] 0/0/0 [I]
uk.ac.cam.	University of Cambridge	[6] 4/4/4 [M]	[1] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.ed.	University of Edinburgh	[6] 0/0/0 [I]	[3] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.ox.	University of Oxford	[4] 1/1/1 [M]	[1] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.stfc.	RAL PPD	[4] 1/1/1 [M]	[4] 0/0/0 [0]	[0] 0/0/0 [-]
uk.ac.susx.	University of Sussex	[4] 0/0/0 [M]	[5] 0/0/0 [I]	[1] 0/0/0 [I]

For each domain and service, report:

1. number of IPv4 interfaces
2. number with IPv6 assigned
3. number of IPv6 addresses pingable
4. number of interfaces actually running over IPv6

A number of GridPP institutes apparently have some IPv6 ready DNS servers...

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- Detailed IPv6 & DNSSEC Service Interface Statistics for 20140815 -

Domain	Organization	DNS	Mail	Web
uk.ac.stfc.	RAL	[4] 1/1/1 [M]	[4] 0/0/0 [O]	[1] 0/0/0 [I]
uk.ac.brunel.	Brunel University	[5] 2/1/2 [M]	[4] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.imperial.	Imperial College London	[4] 3/3/3 [P]	[4] 4/4/0 [P]	[1] 1/1/1 [I]
uk.ac.qmul.	Queen Mary University of London	[4] 0/0/0 [P]	[2] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.rhul.	Royal Holloway University of London	[2] 0/0/0 [I]	[3] 0/0/0 [O]	[1] 0/0/0 [I]
uk.ac.ucl.	University College London	[4] 1/1/1 [M]	[6] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.lancs.	University of Lancaster	[3] 0/0/0 [I]	[5] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.liv.	University of Liverpool	[4] 0/0/0 [M]	[2] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.manchester.	University of Manchester	[4] 1/1/1 [M]	[2] 0/0/0 [I]	[1] 0/0/0 [P]
uk.ac.shef.	University of Sheffield	[3] 2/1/1 [M]	[5] 5/5/0 [O]	[1] 0/0/0 [I]
uk.ac.dur.	University of Durham	[4] 1/1/1 [M]	[4] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.ed.	University of Edinburgh	[6] 0/0/0 [I]	[3] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.gla.	University of Glasgow	[3] 0/0/0 [I]	[2] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.bham.	University of Birmingham	[2] 0/0/0 [I]	[6] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.bris.	University of Bristol	[3] 1/1/1 [M]	[4] 0/0/0 [O]	[1] 0/0/0 [I]
uk.ac.cam.	University of Cambridge	[6] 4/4/4 [M]	[1] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.ed.	University of Edinburgh	[6] 0/0/0 [I]	[3] 0/0/0 [I]	[1] 0/0/0 [I]
uk.ac.ox.	University of Oxford	[4] 1/1/1 [M]	[1] 0/0/0 [I]	[2] 0/0/0 [I]
uk.ac.stfc.	RAL PPD	[4] 1/1/1 [M]	[4] 0/0/0 [O]	[1] 0/0/0 [I]
uk.ac.susx.	University of Sussex	[4] 0/0/0 [M]	[5] 0/0/0 [I]	[1] 0/0/0 [I]

Minimal change!

For each domain and service, report:

1. number of IPv4 interfaces
2. number with IPv6 assigned
3. number of IPv6 addresses pingable
4. number of interfaces actually running over IPv6

A number of GridPP institutes apparently have some IPv6 ready DNS servers

Most of the 'green' DNS servers are Janet servers which have IPv6 addresses



Organisation (domain)	Web	Mail	DNS	NTP	XMPP	SIP
Aberystwyth University / Prifysgol Aberystwyth (aber.ac.uk)	FAIL	FAIL	0/3 0/4			
Brunel University (brunel.ac.uk)	FAIL	FAIL	1/4 2/5			
Cardiff University (cf.ac.uk)	FAIL	FAIL	0/2 1/3			
Heriot-Watt University (hw.ac.uk)	FAIL	FAIL	0/4 0/4			
Imperial College London (ic.ac.uk)	SUCCESS	SUCCESS	2/3 3/4	PROBLEM	FAIL	
Kings College London (kcl.ac.uk)	FAIL	FAIL	0/4 1/5	FAIL		
London School of Economics and Political Science (lse.ac.uk)	FAIL	FAIL (M)	0/3 0/5			
Loughborough University (lboro.ac.uk)	ipv6	FAIL	0/0 4/4	FAIL	FAIL	
Newcastle University (ncl.ac.uk)	PROBLEM	FAIL	0/3 0/4			
Open University UK (open.ac.uk)	FAIL	FAIL	0/3 0/5			
Queen Mary, University of London (qmul.ac.uk)	FAIL	FAIL	0/0 0/4	PROBLEM		
Queen's University Belfast (qub.ac.uk)	FAIL	FAIL	0/2 1/3			
Royal Holloway, University of London (rhul.ac.uk)	FAIL	FAIL	0/2 0/2			
Swansea University (swan.ac.uk)	FAIL	FAIL	0/3 0/4		S:FAIL	
University College London (ucl.ac.uk)	FAIL	FAIL	0/1 1/4			
University of Aberdeen (abdn.ac.uk)	FAIL	FAIL	0/3 1/6			
University of Bath (bath.ac.uk)	FAIL	FAIL	0/1 1/3	FAIL	FAIL	
University of Birmingham (bham.ac.uk)	FAIL	FAIL	0/2 0/2	FAIL		
University of Bristol (bristol.ac.uk)	FAIL	FAIL (P)	0/2 1/3	FAIL		
University of Cambridge (cam.ac.uk)	FAIL	FAIL	4/5 4/6			
University of Dundee (dundee.ac.uk)	FAIL	FAIL	0/2 0/3			
University of Durham (dur.ac.uk)	FAIL	FAIL	0/2 1/4			
University of East Anglia (uea.ac.uk)	FAIL	FAIL	0/2 1/3	FAIL		
University of Edinburgh (ed.ac.uk)	FAIL	FAIL	0/6 0/6			
University of Essex (essex.ac.uk)	FAIL	FAIL	0/5 0/5			
University of Exeter (exeter.ac.uk)	FAIL	FAIL	0/0 1/3			
University of Glasgow (gla.ac.uk)	FAIL	FAIL	0/3 0/3			FAIL
University of Huddersfield (hud.ac.uk)	FAIL	FAIL	0/2 1/3			
University of Hull (hull.ac.uk)	FAIL	FAIL	0/3 1/4	FAIL		
University of Kent (kent.ac.uk)	FAIL	FAIL	3/2 2/3			
University of Lancaster (lancs.ac.uk)	FAIL	FAIL	0/3 0/3	FAIL	S:FAIL	
University of Leeds (leeds.ac.uk)	SUCCESS	FAIL	1/5 2/6			
University of Leicester (le.ac.uk)	FAIL	SUCCESS	0/3 0/4			
University of Liverpool (liv.ac.uk)	FAIL	FAIL	0/2 0/4			
University of Manchester (manchester.ac.uk)	FAIL	FAIL	0/0 1/4			
University of Nottingham (nottingham.ac.uk)	FAIL	FAIL	0/2 0/4	FAIL		
University of Oxford (ox.ac.uk)	FAIL	FAIL	0/3 1/4	PROBLEM		
University of Reading (reading.ac.uk)	SUCCESS	SUCCESS	0/0 3/5		S:BLOCK	FAIL
University of Saint Andrews (st-andrews.ac.uk)	FAIL	FAIL	0/0 0/3			
University of Sheffield (shef.ac.uk)	FAIL	SUCCESS	1/2 1/3		S:FAIL (G)	
University of Southampton (soton.ac.uk)	FAIL	FAIL	0/4 0/4			
University of St Andrews (st-and.ac.uk)	FAIL	FAIL	0/3 0/4			
University of Strathclyde (strath.ac.uk)	FAIL	FAIL	0/2 1/5			
University of Surrey (surrey.ac.uk)	FAIL	FAIL (M)	0/2 0/4			
University of Sussex (susx.ac.uk)	FAIL	FAIL	0/3 0/4			
University of Warwick (warwick.ac.uk)	FAIL	FAIL	0/2 0/2	FAIL	FAIL	FAIL

Site	Discussed with local networking team	Asked for some IPv6 addresses	Has IPv6 addresses	IPv6 allocation	IPv6 enabled hosts (1)	IPv6 hostnames resolvable via IPv6 (2)	Joined HEPIX gridftp testbed	Joined HEPIX phedex testbed	Notes	Date last updated
RAL Tier-1	Yes - ongoing	No	No		No		No	No		
UKI-LT2-Brunel	Yes	Yes	Yes	::/64	Yes	Yes	Yes	Yes (DPM)	IPv6 services in production: Argus and ArcCE/HTC	2014-08-12
UKI-LT2-IC-HEP	Yes	Yes	Yes	::/64	Yes	Yes	Yes (but since left)	Yes (Storm & DPM)	Most production services now dual-stack.	2014-08-12
UKI-LT2-QMUL	Yes	Yes	Yes	::/48 (for grid cluster)	Yes	No	No	Yes (Storm)	Test VLAN including additional dual-stack perfSONAR host which also does jumbo frames. RIPE atlas probe.	
UKI-LT2-RHUL	Yes	Not yet	No		No	No	No		IT will look into after 10GB link commissioning in Sept14	2014-08-12
UKI-LT2-UCL-HEP	Yes	No	No		No	No	No		Central IT IPv6 project still in early stages.	
UKI-NORTHGRID-LANCS-HEP	Yes	Yes	No		No	No	No		On the local networking team's vast to do list.	
UKI-NORTHGRID-LIV-HEP	Yes	Yes	No		No	No	No	No	Central services have a goal by the end of the year to start to support IPv6; HEP has priority; poss. IPv6 addressability in the winter/spring 2015	2014-08-13
UKI-NORTHGRID-MAN-HEP	Yes	In the process	No		No	No	No		NNW is ready and will be happy to help us setup IPv6 at the site. Just need to find the time now.	
UKI-NORTHGRID-SHEF-HEP	Yes	Yes	No		No	No	No	No	IPv6 is not enabled on the subnet gridpp cluster uses yet, the university is going to make changes to core routing equipment at the end of the month.	2014-08-18
UKI-SCOTGRID-DURHAM	Yes	Yes	No						Waiting for networks team to enable IPv6 routing on campus core network	
UKI-SCOTGRID-ECDF	Yes	Yes	No		No	No	No	No	We have the ability to enable IPv6 for networks where requested. Deployment plan yet to be finalised (involves the collaboration with administrators of the end hosts involved, availability of management and monitoring services). Enthusiastic in principle but reservations on how best to implement.	
UKI-SCOTGRID-GLASGOW	Yes	Yes	Yes		Yes	No	Yes (left to join Phedex)	Yes (DPM)	Building a dual stack test cluster.	2014-8-13
UKI-SOUTHGRID-BHAM-HEP	Yes	Yes	No		No	No	No		Have requested IPv6 addresses from University central IT. Waiting to hear back.	2014-08-14
UKI-SOUTHGRID-BRIS	Yes	No	No		No	No	No		University ready and willing - limited manpower at site	2014-08-13
UKI-SOUTHGRID-CAM-HEP	Yes	Yes	Yes	2001:630:212:e10::/64	No	No	No	No	University ready and willing - limited manpower at site	2014-08-12
UKI-SOUTHGRID-OX-HEP	Yes	Yes	Yes	2001:630:441:900::/56	Yes	No	No		Testing stage	20140812
UKI-SOUTHGRID-RALPP	Yes	No	No		No	No	No		IPv6 Now enabled on Campus routers - Waiting for Central testing to finish before the make address spaces available to departments.	
UKI-SOUTHGRID-SUSX	Yes	Yes	No		No	No	No			

- 19 sites in the table
- On-going, we aim to keep it up to date
- 18/19 (95%) have discussed IPv6 situation with their local network team
- 12/19 (63%) have asked for IPv6 addresses
- 6/19 (32%) have IPv6 addresses
- 5/19 (26%) have set up an IPv6 enabled host
- 3/19 (16%) have an IPv6 enabled DNS
- 2/19 (10%) have been members of the HEPiX gridftp mesh (but left to join the HEPiX Phedex testbed)
- 3/19 (16%) are in the HEPiX Phedex testbed

- RHUL: “IT will look into after 10 Gbps link commissioning in Sept14”
- UCL: “Central IT IPv6 project still in early stages.”
- Lancaster: “On the local networking team's vast to do list.”
- Liverpool: “Central services have a goal by the end of the year to start to support IPv6; HEP has priority; poss. IPv6 addressability in the winter/spring 2015 “
- Manchester: “NNW is ready and will be happy to help us setup IPv6 at the site. Just need to find the time now.”
- Sheffield: “IPv6 is not enabled on the subnet gridpp cluster uses yet, the university is going to make changes to core routing equipment at the end of the month.”
- Durham: “Waiting for networks team to enable IPv6 routing on campus core network “
- Edinburgh: “We have the ability to enable IPv6 for networks where requested. Deployment plan yet to be finalised (involves the collaboration with administrators of the end hosts involved, availability of management and monitoring services). Enthusiastic in principle but reservations on how best to implement.”
- Birmingham: “Have requested IPv6 addresses from University central IT. Waiting to hear back.”
- Bristol: “University ready and willing - limited manpower at site“
- Cambridge: “University ready and willing - limited manpower at site”
- RALPP: IPv6 now enabled on Campus routers - Waiting for Central testing to finish before they make address spaces available to departments.

- “Argus running/authenticating over IPv6” (this is under discussion)
- ArcCE working fine on IPv6
- Most production worker nodes are now dual-stack
- Small dual-stack DPM
- perfSONAR: IPv6 OK
- IPv6 currently limited to 1 Gbps, but this cap should be removed relatively soon

- Most hosts within the group both grid and non-grid are dual-stack
- dCache developers have released version 2.10 which supports IPv6 and we will install this soon
- Small IPv6 test cluster consisting of CE, WN, LFC, DPM SE, Storm SE
- Part of HEPiX Phedex testbed and provide required dual stack FTS3 server
- Dual-stack UI also supports other software such as Big Panda and Big Pandamon
- Experimented with xrootd install on the Storm SE but ran in to problems with authentication

- Test VM server running:
 - dual-stack Storm SE (se02) - now part of Phedex testbed
 - xrootd02 - seems to work - see Storage Group blog:
 - <http://gridpp-storage.blogspot.co.uk/2014/07/ipv6-and-xrootd-4.html>
 - also testing ARGUS - see LondonGrid blog being drafted
- A third perfSONAR machine runs release candidate of the perfSONAR software
- Plans:
 - put one of our two gridftp servers (se04) into production dual stack and see what breaks. Likely to be nothing as production FTS doesn't set flag to enable IPv6 transfers.
 - other node types on test VM server (CE, WN).

- Existing dual-stack UI been complemented with an IPv6-only UI
 - accounts available to known individuals who want them
- A single-stack IPv6 DPM
- Dual-stack BDII, perfSONAR hosts and DNS resolver
- Testing of the ARGUS server over IPv6
- A test ARC CE server with a couple of dual-stack worker nodes
- A dual stack Squid 3.x that forwards to the IPv4-only 'Frontier' squid. This is mostly used at the moment for
 - package updates on the IPv6-only DPM
 - for the DPM to get at the ARGUS server for user banning (because while the ARGUS is dual-stack, it doesn't actually work)
 - for the IPv6-only UI to access cvmfs

A few observations of things that do/don't work:-

- **cvmfs:** The squid proxy that it is configured to use is a dual stack one, and with that it appears to work fine.
- **voms-proxy-init:** Doesn't work against dteam VOMS servers since they're not IPv6 accessible, but doesn't (or can't) use `http_proxy` or `https_proxy` environment variables to go via the squid. Need to create dteam proxy elsewhere and scp it in manually.
- **voms-proxy-init (again):** It still doesn't work with a UK local VO that does have a dual stack VOMS server. The server itself is accessible over IPv6, but `voms-proxy-init` doesn't seem to even try it (note this is `voms-clients3-3.0.4-1.sl6.noarch`).
- **lcg-infosites:** Doesn't work even against a dual stack top BDII. As it is a perl script, it works if you hack `'use Net::INET6Glue;'` into the top of it.
- **lcg-cr:** Works (more or less) against an IPv6 accessible SE so long as `'GLOBUS_FTP_CLIENT_IPV6=true'` is set in the environment. Can't access the LFC though, so while the file gets uploaded, it's not registered (it could presumably still be registered manually from another UI).

- Currently IPv6 is restricted to small test cluster
- 12 IPv6 dual-stack (old) machines for testing various services.
- 1 IPv6-only SE used to test IPv6 only deployment.
- As part of HEPiX; initially a member of the GridFTP testbed - withdrew to join Phedex testing.
- Allocated a `::/64` of addresses from University.
- IPv6 address assigned via SLAAC.
- Test cluster under re-organisation so IPv6 service availability is reduced.

- Currently no production DNS which is accessible over IPv6 at Glasgow (all lookups are via IPv4)
- Test DNS on IPv6 was available but has not moved to production
- Reverse DNS of IPv6 addresses has proven unstable in the past, leading to issues with authentication
- Reverse mappings entered by hand led to errors; service would not always recover from reboots
- Improved greatly since it has been moved to production environment
- Test circuit restricted to 1Gbps, switch shared with local research groups (and students)
- Internal routing issues mean production cluster can't be moved to IPv6 without loss of performance/redundancy

- Need Institutional support not just Central IT
 - Politics
 - Back-pressure from other network users (mainly Product, College and School IT teams).
 - Hardware Capabilities
 - Older equipment doesn't support IPv6.
 - (Firewalls don't support IPv6 natively leading to loaded CPU).
 - Workarounds can be put in place but lose capabilities.
 - Local tooling
 - In-house and purchased tools don't support IPv6.
 - Time and effort needed to recreate tools.
 - Security
 - Current models don't work when every IP globally routable.
 - ICMPv6 blocking leads to discovery problems.

- Aiming to get a working dual-stack SAM Nagios instance
- Currently includes hosts at Brunel, Imperial, Oxford and QMUL
- Using the dteam VO

Nagios internal servers (nagios)

Host	Status	Services	Actions
cetest01.grid.hep.ph.ic.ac.uk	UP	14 OK	
dc2-grid-26.brunel.ac.uk	UP	14 OK	
t2arc00.physics.ox.ac.uk	UP	13 OK 1 CRITICAL	

ARC-CE nodes (node-ARC-CE)

Host	Status	Services	Actions
cetest01.grid.hep.ph.ic.ac.uk	UP	14 OK	
dc2-grid-26.brunel.ac.uk	UP	14 OK	
t2arc00.physics.ox.ac.uk	UP	13 OK 1 CRITICAL	

CREAM-CE nodes (node-CREAM-CE)

Host	Status	Services	Actions
ce05.esc.qmul.ac.uk	UP	11 OK 3 WARNING 2 CRITICAL	
ceprod07.grid.hep.ph.ic.ac.uk	UP	16 OK	
cetest00.grid.hep.ph.ic.ac.uk	UP	16 OK	
dc2-grid-66.brunel.ac.uk	UP	15 OK 1 WARNING	
v6ce00.grid.hep.ph.ic.ac.uk	UP	12 OK 4 CRITICAL	

MyProxy nodes (node-MyProxy)

Host	Status	Services	Actions
myproxy.grid.hep.ph.ic.ac.uk	UP	1 OK	

NAGIOS nodes (node-NAGIOS)

Host	Status	Services	Actions
v6nagios02.grid.hep.ph.ic.ac.uk	UP	27 OK 3 CRITICAL	

SRMv2 nodes (node-SRMv2)

Host	Status	Services	Actions
dc2-grid-23.brunel.ac.uk	UP	9 OK	
dc2-grid-64.brunel.ac.uk	UP	9 OK	
gfe02.grid.hep.ph.ic.ac.uk	UP	9 OK	
se02.esc.qmul.ac.uk	UP	9 OK	
t2dpm1-v6.physics.ox.ac.uk	UP	9 OK	
v6se00.grid.hep.ph.ic.ac.uk	UP	9 OK	

Site-BDII nodes (node-Site-BDII)

Host	Status	Services	Actions
bdii.grid.hep.ph.ic.ac.uk	UP	4 OK	
t2bdii06.physics.ox.ac.uk	UP	4 OK	

Top-BDII nodes (node-Top-BDII)

Host	Status	Services	Actions
topbdii.grid.hep.ph.ic.ac.uk	UP	3 OK	

WMS nodes (node-WMS)

Host	Status	Services	Actions
wms01.grid.hep.ph.ic.ac.uk	UP	4 OK	
wms02.grid.hep.ph.ic.ac.uk	UP	4 OK	

Site UKI-LT2-Brunel (site-UKI-LT2-Brunel)

Host	Status	Services	Actions
dc2-grid-23.brunel.ac.uk	UP	9 OK	
dc2-grid-26.brunel.ac.uk	UP	14 OK	
dc2-grid-64.brunel.ac.uk	UP	9 OK	
dc2-grid-66.brunel.ac.uk	UP	15 OK 1 WARNING	

Site UKI-LT2-IC-HEP (site-UKI-LT2-IC-HEP)

Host	Status	Services	Actions
bdii.grid.hep.ph.ic.ac.uk	UP	4 OK	
ceprod07.grid.hep.ph.ic.ac.uk	UP	16 OK	
cetest00.grid.hep.ph.ic.ac.uk	UP	16 OK	
cetest01.grid.hep.ph.ic.ac.uk	UP	14 OK	
gfe02.grid.hep.ph.ic.ac.uk	UP	9 OK	
topbdii.grid.hep.ph.ic.ac.uk	UP	3 OK	
v6ce00.grid.hep.ph.ic.ac.uk	UP	12 OK 4 CRITICAL	
v6se00.grid.hep.ph.ic.ac.uk	UP	9 OK	
wms01.grid.hep.ph.ic.ac.uk	UP	4 OK	
wms02.grid.hep.ph.ic.ac.uk	UP	4 OK	

Site UKI-LT2-QMUL (site-UKI-LT2-QMUL)

Host	Status	Services	Actions
ce05.esc.qmul.ac.uk	UP	11 OK 3 WARNING 2 CRITICAL	
se02.esc.qmul.ac.uk	UP	9 OK	

Site UKI-SOUTHGRID-OX-HEP (site-UKI-SOUTHGRID-OX-HEP)

Host	Status	Services	Actions
t2arc00.physics.ox.ac.uk	UP	13 OK 1 CRITICAL	
t2bdii06.physics.ox.ac.uk	UP	4 OK	
t2dpm1-v6.physics.ox.ac.uk	UP	9 OK	

Site nagios (site-nagios)

Host	Status	Services	Actions
myproxy.grid.hep.ph.ic.ac.uk	UP	1 OK	
v6nagios02.grid.hep.ph.ic.ac.uk	UP	27 OK 3 CRITICAL	

- Storage elements
 - copy a file into the SE with lcg-cp

SRMv2 nodes (node-SRMv2)

Host	Status	Services	Actions
dc2-grid-23.brunel.ac.uk	UP	9 OK	
dc2-grid-64.brunel.ac.uk	UP	9 OK	
gfe02.grid.hep.ph.ic.ac.uk	UP	9 OK	
se02.esc.qmul.ac.uk	UP	9 OK	
t2dpm1-v6.physics.ox.ac.uk	UP	9 OK	
v6se00.grid.hep.ph.ic.ac.uk	UP	9 OK	

IPv4 only

Host	Service	Status	Start Time	Duration	Attempts	Message
gfe02.grid.hep.ph.ic.ac.uk	hr.srce.SRM2-CertLifetime	OK	08-13-2014 10:05:18	21d 1h 30m 45s	1/2	CERT LIFETIME OK - Certificate will expire in 386.27 days (Sep 3 15:33:18 2015 GMT)
	org.sam.SRM-All-dteam	OK	08-13-2014 10:41:38	2d 11h 54m 25s	1/4	OK: success.
	org.sam.SRM-Del-dteam	OK	08-13-2014 10:41:41	18d 11h 24m 28s	1/4	OK: File was deleted from SRM.
	org.sam.SRM-Get-dteam	OK	08-13-2014 10:41:41	8d 17h 54m 22s	1/4	OK: File was copied from SRM. Diff successful.
	org.sam.SRM-GetSURLs-dteam	OK	08-13-2014 10:41:38	21d 1h 24m 32s	1/4	OK: Got SRM endpoint(s) and Storage Path(s) from BDII
	org.sam.SRM-GetTURLs-dteam	OK	08-13-2014 10:41:40	8d 17h 54m 23s	1/4	OK: protocols OK-[https, gsiftp, gsidcap]
	org.sam.SRM-Ls-dteam	OK	08-13-2014 10:41:39	18d 11h 24m 31s	1/4	OK: listing [/pnfs/hep.ph.ic.ac.uk/data/dteam/testfile-put-1407922898-1dca3e042c58.txt]-ok:
	org.sam.SRM-LsDir-dteam	OK	08-13-2014 10:41:38	20d 0h 54m 32s	1/4	OK: Storage Path[/pnfs/hep.ph.ic.ac.uk/data/dteam]-ok:
	org.sam.SRM-Put-dteam	OK	08-13-2014 10:41:39	18d 11h 24m 31s	1/4	OK: File was copied to SRM.

dual-stack

Host	Service	Status	Start Time	Duration	Attempts	Message
se02.esc.qmul.ac.uk	hr.srce.SRM2-CertLifetime	OK	08-13-2014 09:19:47	22d 15h 37m 35s	1/2	CERT LIFETIME OK - Certificate will expire in 269.27 days (May 9 14:47:34 2015 GMT)
	org.sam.SRM-All-dteam	OK	08-13-2014 11:09:33	8d 17h 26m 30s	1/4	OK: success.
	org.sam.SRM-Del-dteam	OK	08-13-2014 11:09:47	8d 17h 26m 18s	1/4	OK: File was deleted from SRM.
	org.sam.SRM-Get-dteam	OK	08-13-2014 11:09:47	8d 17h 26m 18s	1/4	OK: File was copied from SRM. Diff successful.
	org.sam.SRM-GetSURLs-dteam	OK	08-13-2014 11:09:33	21d 1h 12m 6s	1/4	OK: Got SRM endpoint(s) and Storage Path(s) from BDII
	org.sam.SRM-GetTURLs-dteam	OK	08-13-2014 11:09:42	8d 17h 26m 20s	1/4	OK: protocols OK-[file, https, gsiftp]
	org.sam.SRM-Ls-dteam	OK	08-13-2014 11:09:36	8d 17h 26m 27s	1/4	OK: listing [/dteam/testfile-put-1407924573-3e07a226b3f2.txt]-ok:
	org.sam.SRM-LsDir-dteam	OK	08-13-2014 11:09:33	8d 17h 26m 30s	1/4	OK: Storage Path[/dteam]-ok:
	org.sam.SRM-Put-dteam	OK	08-13-2014 11:09:36	8d 17h 26m 27s	1/4	OK: File was copied to SRM.

IPv6 only

Host	Service	Status	Start Time	Duration	Attempts	Message
t2dpm1-v6.physics.ox.ac.uk	hr.srce.SRM2-CertLifetime	OK	08-13-2014 09:59:26	21d 1h 36m 37s	1/2	CERT LIFETIME OK - Certificate will expire in 275.28 days (May 15 15:44:45 2015 GMT)
	org.sam.SRM-All-dteam	OK	08-13-2014 10:43:18	1d 0h 52m 45s	1/4	OK: success.
	org.sam.SRM-Del-dteam	OK	08-13-2014 10:43:29	1d 0h 52m 35s	1/4	OK: File was deleted from SRM.
	org.sam.SRM-Get-dteam	OK	08-13-2014 10:43:29	1d 0h 52m 35s	1/4	OK: File was copied from SRM. Diff successful.
	org.sam.SRM-GetSURLs-dteam	OK	08-13-2014 10:43:18	21d 1h 30m 23s	1/4	OK: Got SRM endpoint(s) and Storage Path(s) from BDII
	org.sam.SRM-GetTURLs-dteam	OK	08-13-2014 10:43:26	1d 0h 52m 38s	1/4	OK: protocols OK-[rfile, gsiftp]
	org.sam.SRM-Ls-dteam	OK	08-13-2014 10:43:22	1d 0h 52m 42s	1/4	OK: listing [/dpm/physics.ox.ac.uk/home/dteam/testfile-put-1407922998-e9d0e570ef81.txt]-ok:
	org.sam.SRM-LsDir-dteam	OK	08-13-2014 10:43:18	20d 1h 0m 22s	1/4	OK: Storage Path[/dpm/physics.ox.ac.uk/home/dteam]-ok:
	org.sam.SRM-Put-dteam	OK	08-13-2014 10:43:22	1d 0h 52m 42s	1/4	OK: File was copied to SRM.

- Submit jobs to IPv4, dual-stack and IPv6-only CREAM CE's

CREAM-CE nodes (node-CREAM-CE)

Host	Status	Services	Actions
ce05.esc.qmul.ac.uk	UP	11 OK 3 WARNING 2 CRITICAL	
ceprod07.grid.hep.ph.ic.ac.uk	UP	16 OK	
cetest00.grid.hep.ph.ic.ac.uk	UP	16 OK	
dc2-grid-66.brunel.ac.uk	UP	15 OK 1 WARNING	
v6ce00.grid.hep.ph.ic.ac.uk	UP	12 OK 4 CRITICAL	

dc2-grid-66.brunel.ac.uk	emi.cream.CREAMCE-DirectJobState-dteam		OK	08-13-2014 11:38:13	1d 1h 4m 45s	1/2	OK: [IDLE] https://dc2-grid-66.brunel.ac.uk:8443/CREAM193138472
	emi.cream.CREAMCE-DirectJobSubmit-dteam		OK	08-13-2014 11:03:16	8d 13h 30m 40s	1/2	OK: DONE.
	emi.cream.CREAMCE-JobState-dteam		OK	08-13-2014 11:29:15	1d 18h 32m 53s	1/2	OK: success.
	emi.cream.CREAMCE-JobSubmit-dteam		OK	08-13-2014 11:29:15	6d 4h 2m 51s	1/2	OK: success.
	emi.wn.WN-Bi-dteam		OK	08-13-2014 11:21:08	18d 21h 22m 21s	1/2	wn-b1-25-00.brunel.ac.uk: OK: getCE: dc2-grid-66.brunel.ac.uk:8443/cream-pbs-dteam
	emi.wn.WN-Csh-dteam		OK	08-13-2014 11:21:09	18d 21h 22m 20s	1/2	wn-b1-25-00.brunel.ac.uk: OK
	emi.wn.WN-SoftVer-dteam		OK	08-13-2014 11:21:10	18d 21h 22m 19s	1/2	wn-b1-25-00.brunel.ac.uk: OK: EMI 3.10.0-1.el6
	hr.srce.CADist-Check-dteam		OK	08-13-2014 11:21:15	18d 21h 22m 14s	1/2	wn-b1-25-00.brunel.ac.uk: CA DIST OK - The official version is 1.58. Using AAACertificateServices to get CA distribution version. CA distribution is correctly installed.
	hr.srce.CREAMCE-CertLifetime		OK	08-13-2014 09:59:05	21d 1h 40m 1s	1/2	CERT LIFETIME OK - Certificate will expire in 270.08 days (May 10 10:47:54 2015 GMT)
	org.sam.WN-Rep-dteam		OK	08-13-2014 11:21:50	5d 21h 17m 5s	1/2	wn-b1-25-00.brunel.ac.uk: OK: success.
	org.sam.WN-RepCr-dteam		OK	08-13-2014 11:21:20	5d 21h 17m 15s	1/2	wn-b1-25-00.brunel.ac.uk: OK: File was copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC v6lfc00.grid.hep.ph.ic.ac.uk. CLI
	org.sam.WN-RepDel-dteam		OK	08-13-2014 11:21:51	5d 21h 17m 5s	1/2	wn-b1-25-00.brunel.ac.uk: OK: Replicas for [fn:/grid/dteam/SAM/sam-lcg-rm-cr-wn-b1-25-00.brunel.ac.uk.140813102114.28254210] were deleted. CLI
	org.sam.WN-RepFree-dteam		OK	08-13-2014 11:21:14	18d 21h 22m 14s	1/2	wn-b1-25-00.brunel.ac.uk: OK: ok
	org.sam.WN-RepGel-dteam		OK	08-13-2014 11:21:24	5d 21h 17m 12s	1/2	wn-b1-25-00.brunel.ac.uk: OK: File was copied from SRM. Diff successful. CLI
org.sam.WN-RepIServ-dteam		OK	08-13-2014 11:21:14	18d 21h 22m 14s	1/2	wn-b1-25-00.brunel.ac.uk: OK: LCG_GFAL_INFOSYS is set to lcg-bdii.gridpp.rl.ac.uk:2170,topbdii.gridpp.rl.ac.uk:2170,topbdii.grid.hep.ph.ic.ac.uk:2170,top-bdii.tier2.hep.manchester.ac.uk:2170	
org.sam.WN-RepRep-dteam		OK	08-13-2014 11:21:49	5d 21h 17m 6s	1/2	wn-b1-25-00.brunel.ac.uk: OK: File was replicated to SE(s) gfe02.grid.hep.ph.ic.ac.uk. Replicas listed successfully. CLI	
v6ce00.grid.hep.ph.ic.ac.uk	emi.cream.CREAMCE-DirectJobState-dteam		OK	08-13-2014 11:23:16	0d 16h 19m 45s	1/2	OK: DONE.
	emi.cream.CREAMCE-DirectJobSubmit-dteam		OK	08-13-2014 11:23:16	0d 16h 0m 49s	1/2	OK: DONE.
	emi.cream.CREAMCE-JobState-dteam		OK	08-13-2014 11:14:15	4d 11h 27m 55s	1/2	OK: success.
	emi.cream.CREAMCE-JobSubmit-dteam		OK	08-13-2014 11:14:15	4d 11h 12m 53s	1/2	OK: success.
	emi.wn.WN-Bi-dteam		OK	08-13-2014 08:11:34	21d 0h 13m 11s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: getCE: v6ce00.grid.hep.ph.ic.ac.uk:8443/cream-sge-all.q
	emi.wn.WN-Csh-dteam		OK	08-13-2014 08:11:37	21d 0h 13m 10s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK
	emi.wn.WN-SoftVer-dteam		OK	08-13-2014 08:11:38	21d 0h 13m 9s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: EMI 3.7.2-1.el6
	hr.srce.CADist-Check-dteam		OK	08-13-2014 08:11:41	21d 0h 13m 6s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: CA DIST OK - The official version is 1.58. Using AAACertificateServices to get CA distribution version. CA distribution is correctly installed.
	hr.srce.CREAMCE-CertLifetime		OK	08-13-2014 09:38:28	7d 18h 12m 47s	1/2	CERT LIFETIME OK - Certificate will expire in 269.00 days (May 9 08:43:53 2015 GMT)
	org.sam.WN-Rep-dteam		OK	08-13-2014 08:11:56	0d 16h 13m 50s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: success.
	org.sam.WN-RepCr-dteam		OK	08-13-2014 08:11:47	21d 0h 12m 59s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: File was copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC v6lfc00.grid.hep.ph.ic.ac.uk. CLI
	org.sam.WN-RepDel-dteam		OK	08-13-2014 08:11:56	21d 0h 12m 39s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: Replicas for [fn:/grid/dteam/SAM/sam-lcg-rm-cr-v6wn00.grid.hep.ph.ic.ac.uk.140813071141.212994] were deleted. CLI
	org.sam.WN-RepFree-dteam		OK	08-13-2014 08:11:40	21d 0h 13m 5s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: ok
	org.sam.WN-RepGel-dteam		OK	08-13-2014 08:11:52	21d 0h 12m 55s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: File was copied from SRM. Diff successful. CLI
org.sam.WN-RepIServ-dteam		OK	08-13-2014 08:11:40	21d 0h 13m 5s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: LCG_GFAL_INFOSYS is set to localbdii.grid.hep.ph.ic.ac.uk:2170	
org.sam.WN-RepRep-dteam		OK	08-13-2014 08:11:55	0d 16h 13m 52s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: File was replicated to SE(s) v6se00.grid.hep.ph.ic.ac.uk. There were problems listing replicas. CLI	

- IPv6-enabled worker nodes
 - copy a file into the IPv6-only SE and register in IPv6-only LFC (v6lfc00) with lcg-cr
 - IPv6-only WN needs an IPv4 route through to the message broker however

CREAM-CE nodes (node-CREAM-CE)

Host	Status	Services	Actions
ce05.esc.qmul.ac.uk	UP	11 OK 3 WARNING 2 CRITICAL	
ceprod07.grid.hep.ph.ic.ac.uk	UP	16 OK	
cetest00.grid.hep.ph.ic.ac.uk	UP	16 OK	
dc2-grid-66.brunel.ac.uk	UP	15 OK 1 WARNING	
v6ce00.grid.hep.ph.ic.ac.uk	UP	12 OK 4 CRITICAL	

emi.cream.CREAMCE-DirectJobState-dteam		OK	08-13-2014 11:23:16	0d 16h 19m 45s	1/2	OK: DONE.
emi.cream.CREAMCE-DirectJobSubmit-dteam	?	OK	08-13-2014 11:23:16	0d 16h 0m 49s	1/2	OK: DONE.
emi.cream.CREAMCE-JobState-dteam		OK	08-13-2014 11:14:15	4d 11h 27m 55s	1/2	OK: success.
emi.cream.CREAMCE-JobSubmit-dteam	?	OK	08-13-2014 11:14:15	4d 11h 12m 53s	1/2	OK: success.
emi.wn.WN-Bi-dteam	?	OK	08-13-2014 08:11:34	21d 0h 13m 11s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: getCE: v6ce00.grid.hep.ph.ic.ac.uk:8443/cream-sge-all.q
emi.wn.WN-Csh-dteam	?	OK	08-13-2014 08:11:37	21d 0h 13m 10s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK
emi.wn.WN-SoftVer-dteam	?	OK	08-13-2014 08:11:38	21d 0h 13m 9s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: EMI 3.7.2-1.el6
hr.srce.CADist-Check-dteam	?	OK	08-13-2014 08:11:41	21d 0h 13m 6s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: CA DIST OK - The official version is 1.58. Using AAACertificateServices to get CA distribution version. CA distrib is correctly installed.
hr.srce.CREAMCE-CertLifetime		OK	08-13-2014 09:38:28	7d 18h 12m 47s	1/2	CERT LIFETIME OK - Certificate will expire in 269.00 days (May 9 08:43:53 2015 GMT)
org.sam.WN-Rep-dteam	?	OK	08-13-2014 08:11:56	0d 16h 13m 50s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: success.
org.sam.WN-RepCr-dteam	?	OK	08-13-2014 08:11:47	21d 0h 12m 59s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: File was copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC v6lfc00.grid.hep.ph.ic.ac.uk. CLI
org.sam.WN-RepDel-dteam	?	OK	08-13-2014 08:11:56	21d 0h 12m 39s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: Replicas for [lfn:/grid/dteam/SAM/sam-lcg-rm-cr-v6wn00.grid.hep.ph.ic.ac.uk.140813071141.212994] were deleted. CLI
org.sam.WN-RepFree-dteam	?	OK	08-13-2014 08:11:40	21d 0h 13m 5s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: ok
org.sam.WN-RepGet-dteam	?	OK	08-13-2014 08:11:52	21d 0h 12m 55s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: File was copied from SRM. Diff successful. CLI
org.sam.WN-RepSenv-dteam	?	OK	08-13-2014 08:11:40	21d 0h 13m 5s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: LCG_GFAL_INFOSYS is set to localbdii.grid.hep.ph.ic.ac.uk:2170
org.sam.WN-RepRep-dteam	?	OK	08-13-2014 08:11:55	0d 16h 13m 52s	1/2	v6wn00.grid.hep.ph.ic.ac.uk: OK: File was replicated to SE(s) v6se00.grid.hep.ph.ic.ac.uk. There were problems listing replicas. CLI

- IPv4-only worker nodes
 - job runs, but file transfers to IPv6-only SE fail as expected

CREAM-CE nodes (node-CREAM-CE)

Host	Status	Services	Actions
ce05.esc.qmul.ac.uk	UP	11 OK 3 WARNING 2 CRITICAL	
ceprod07.grid.hep.ph.ic.ac.uk	UP	16 OK	
cetest00.grid.hep.ph.ic.ac.uk	UP	16 OK	
dc2-grid-66.brunel.ac.uk	UP	15 OK 1 WARNING	
v6ce00.grid.hep.ph.ic.ac.uk	UP	12 OK 4 CRITICAL	

Host	Service	Status	Start Time	Duration	Attempts	Output
ce05.esc.qmul.ac.uk	emi.cream.CREAMCE-DirectJobState-dteam	OK	08-15-2014 08:27:16	1d 20h 18m 50s	1/2	OK: DONE.
	emi.cream.CREAMCE-DirectJobSubmit-dteam	OK	08-15-2014 08:27:16	1d 20h 11m 57s	1/2	OK: DONE.
	emi.cream.CREAMCE-JobState-dteam	OK	08-15-2014 08:08:31	1d 20h 12m 42s	1/2	OK: success.
	emi.cream.CREAMCE-JobSubmit-dteam	OK	08-15-2014 08:08:31	1d 19h 55m 48s	1/2	OK: success.
	emi.wn.WN-Bi-dteam	OK	08-15-2014 07:53:00	1d 20h 7m 36s	1/2	cn590: OK: getCE: ce05.esc.qmul.ac.uk:8443/cream-sge-sl6_lcg_test
	emi.wn.WN-Csh-dteam	OK	08-15-2014 07:53:01	1d 20h 7m 35s	1/2	cn590: OK
	emi.wn.WN-SoftVer-dteam	OK	08-15-2014 07:53:02	1d 20h 7m 34s	1/2	cn590: OK: EMI 3.7.4-1.el6
	hr.srce.CADist-Check-dteam	OK	08-15-2014 07:53:06	1d 20h 7m 31s	1/2	cn590: CA DIST OK - The official version is 1.58. Using AAACertificateServices to get CA distribution version. CA distribution is correctly installed.
	hr.srce.CREAMCE-CertLifetime	OK	08-15-2014 04:40:20	1d 20h 6m 33s	1/2	CERT LIFETIME OK - Certificate will expire in 267.46 days (May 9 14:47:30 2015 GMT)
	org.sam.WN-Rep-dteam	CRITICAL	08-15-2014 07:53:38	1d 18h 7m 53s	2/2	cn590: CRITICAL: METRIC FAILED [org.sam.WN-RepCr]: CRITICAL: File was NOT copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC prod-lfc-shared-central.cern.ch. [ErrDB:[('log_util_wn', 'server', 'CRITICAL')]] CLI
	org.sam.WN-RepCr-dteam	CRITICAL	08-15-2014 07:53:38	1d 18h 7m 52s	2/2	cn590: CRITICAL: File was NOT copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC prod-lfc-shared-central.cern.ch. [ErrDB:[('log_util_wn', 'server', 'CRITICAL')]] CLI
	org.sam.WN-RepDel-dteam	WARNING	08-15-2014 07:53:38	1d 20h 7m 21s	2/2	cn590: WARNING: Masked by org.sam.WN-RepCr - "CRITICAL: File was NOT copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC prod-lfc-shared-central.cern.ch. [ErrDB:[('log_util_wn', 'server', 'CRITICAL')]] CLI"
	org.sam.WN-RepFree-dteam	OK	08-15-2014 07:53:05	1d 18h 8m 25s	1/2	cn590: OK: ok
	org.sam.WN-RepGet-dteam	WARNING	08-15-2014 07:53:38	1d 20h 7m 21s	2/2	cn590: WARNING: Masked by org.sam.WN-RepCr - "CRITICAL: File was NOT copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC prod-lfc-shared-central.cern.ch. [ErrDB:[('log_util_wn', 'server', 'CRITICAL')]] CLI"
	org.sam.WN-RepISenv-dteam	OK	08-15-2014 07:53:05	1d 20h 7m 31s	1/2	cn590: OK: LCG_GFAL_INFOSYS is set to lcg-bdii.gridpp.ac.uk:2170.topbdii.grid.hep.ph.ic.ac.uk:2170
	org.sam.WN-RepRep-dteam	WARNING	08-15-2014 07:53:38	1d 20h 7m 21s	2/2	cn590: WARNING: Masked by org.sam.WN-RepCr - "CRITICAL: File was NOT copied to SE v6se00.grid.hep.ph.ic.ac.uk and registered in LFC prod-lfc-shared-central.cern.ch. [ErrDB:[('log_util_wn', 'server', 'CRITICAL')]] CLI"

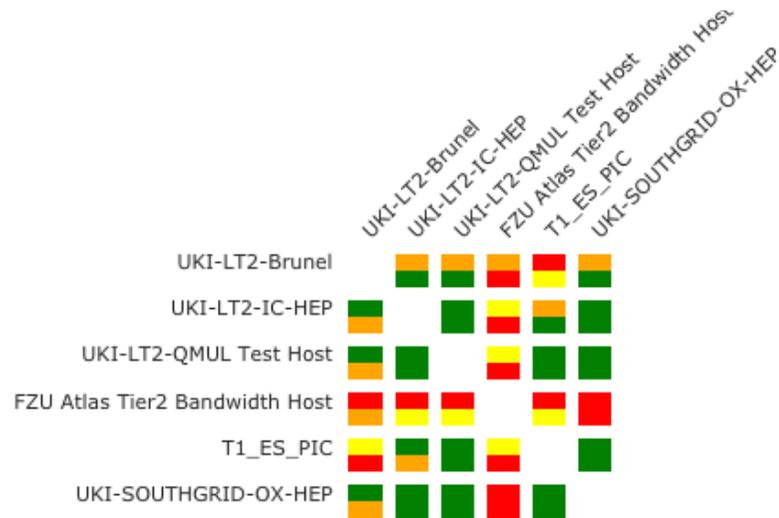
- Recently added support for ARC CEs

ARC-CE nodes (node-ARC-CE)

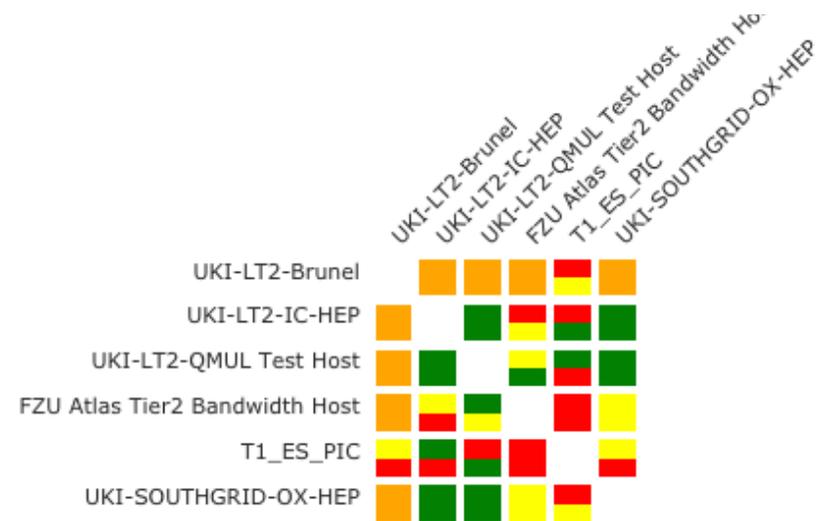
Host	Status	Services	Actions
cetest01.grid.hep.ph.ic.ac.uk	UP	14 OK	   
dc2-grid-26.brunel.ac.uk	UP	14 OK	   
t2arc00.physics.ox.ac.uk	UP	13 OK 1 CRITICAL	   

Host	Service	Status	Start Time	Duration	Attempts	Output
t2arc00.physics.ox.ac.uk	org.nordugrid.ARC-CE-ARIS	OK	08-15-2014 08:43:17	1d 15h 6m 8s	1/3	1 cluster (nordugrid-arc-4.1.0), 1 queue (active)
	org.nordugrid.ARC-CE-IGTF-dteam	OK	08-15-2014 08:08:01	1d 14h 36m 25s	1/2	IGTF-1.58, 44 days old, all present.
	org.nordugrid.ARC-CE-LFC-result-dteam	CRITICAL	08-15-2014 08:48:04	0d 19h 6m 25s	2/2	Job terminated as FAILED. - Failed in data staging: Could not resolve any source replicas for lfc://v6lfc00.grid.hep.ph.ic.ac.uk:5010/grid/dteam/brand/nagios-v6nagios02.grid.hep.ph.ic.ac.uk/arcce/lfc-input: Resolving of index service for source failed: Temporary service error: Communication error - JID: gsiftp://t2arc00.physics.ox.ac.uk:2811/jobs/xiwNDmVWQcknjGWBFm1cyeCnABFKDmABFKDmHepKdMABFKDm2rtLqm
	org.nordugrid.ARC-CE-LFC-submit-dteam	OK	08-15-2014 07:49:30	1d 14h 59m 55s	1/2	Job submitted.
	org.nordugrid.ARC-CE-SRM-result-dteam	OK	08-15-2014 08:03:00	0d 1h 46m 25s	1/2	Job succeeded. - JID: gsiftp://t2arc00.physics.ox.ac.uk:2811/jobs/T6xKdMxXbQcknjGWBFm1cyeCnABFKDmABFKDmC0pKdMABFKDm0xUZnN
	org.nordugrid.ARC-CE-SRM-submit-dteam	OK	08-15-2014 07:55:42	1d 14h 53m 43s	1/2	Job submitted.
	org.nordugrid.ARC-CE-lfc-dteam	OK	08-14-2014 11:58:03	1d 14h 46m 8s	1/2	Service OK
	org.nordugrid.ARC-CE-result-dteam	OK	08-15-2014 08:08:01	1d 14h 36m 25s	1/2	Job succeeded. - JID: gsiftp://t2arc00.physics.ox.ac.uk:2811/jobs/zxjNDmXhQcknjGWBFm1cyeCnABFKDmABFKDmMTqKdMABFKDmLUXEsm
	org.nordugrid.ARC-CE-srm-dteam	OK	08-15-2014 08:03:00	1d 14h 46m 8s	1/2	Service OK
	org.nordugrid.ARC-CE-submit-dteam	OK	08-15-2014 08:01:55	1d 14h 47m 30s	1/2	Job submitted.
	org.nordugrid.ARC-CE-sw-csh-dteam	OK	08-15-2014 08:08:01	1d 14h 36m 25s	1/2	Found working csh.
	org.nordugrid.ARC-CE-sw-gcc-dteam	OK	08-15-2014 08:08:01	1d 14h 36m 25s	1/2	Found GCC version 4.4.7.
	org.nordugrid.ARC-CE-sw-perl-dteam	OK	08-15-2014 08:08:01	1d 14h 36m 25s	1/2	Found Perl version 5.10.1.
	org.nordugrid.ARC-CE-sw-python-dteam	OK	08-15-2014 08:08:01	1d 14h 36m 25s	1/2	Found Python version 2.6.6.

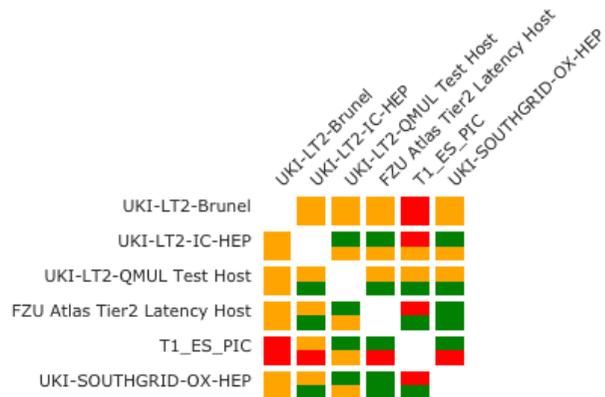
HEPiX IPv6 sites - IPv4 throughput test



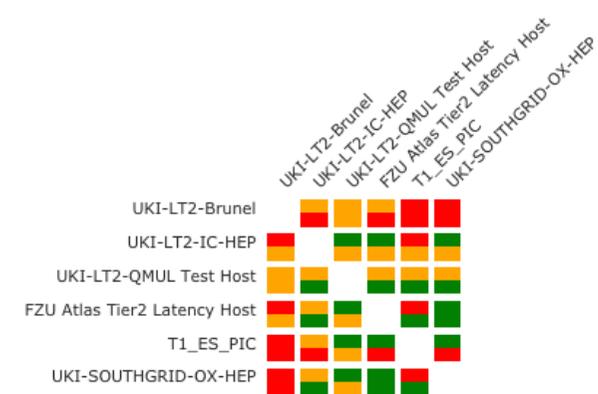
HEPiX IPv6 sites - IPv6 throughput test



HEPiX IPv6 sites - IPv4 latency test



HEPiX IPv6 sites - IPv6 latency test



- Currently eight sites in the mesh
 - Brunel, Imperial, QMUL, Oxford
 - FZU (Prague)
 - T2_FI_HIP (Finland)
 - PIC (Spain)
 - UNL (Nebraska, USA)
- Measuring
 - throughput
 - latency and loss
 - traceroute
 - Ping

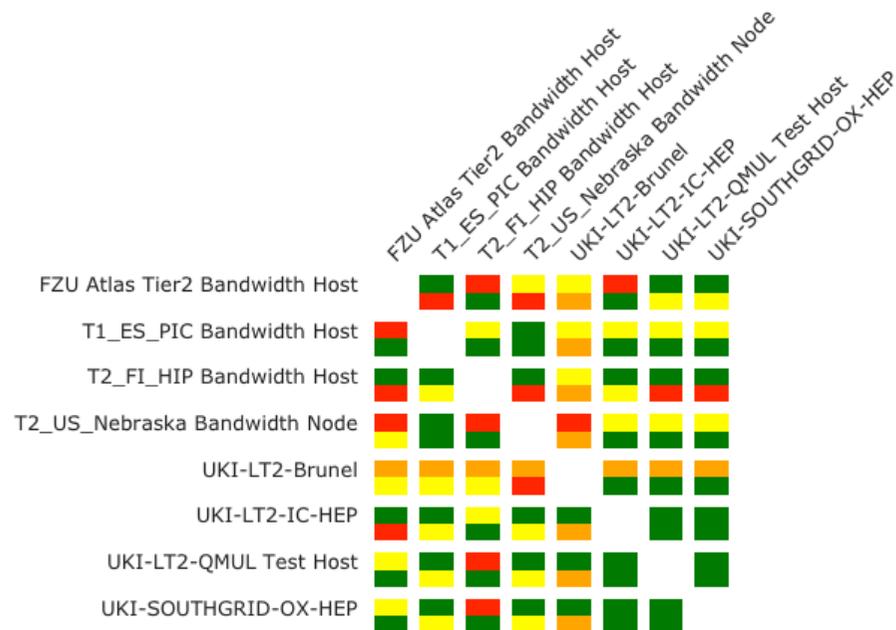
perfSONAR Dashboard

Dashboards

HEPiX IPv6 sites Dashboard

HEPiX IPv6 sites - IPv4 throughput test

■ Throughput \geq 400Mbps
 ■ Throughput $<$ 400Mbps
 ■ Throughput \leq 100Mbps
 ■ Unable to retrieve data



- Also collecting IPv4 and IPv6 traceroute data
- Can be useful for identifying asymmetric routing
- Routes between Imperial College and Nebraska are shown below

Select endpoints available on http://localhost:8086/perfSONAR_PS/services/traceroute

netmon02-v4.grid.hep.ph.ic.ac.uk (146.179.247.184) ----> hcc-ps01.unl.edu (129.93.239.148)

Do not de-duplicate results

Select endpoints available on http://localhost:8086/perfSONAR_PS/services/tracerouteMA

netmon02-v6.grid.hep.ph.ic.ac.uk (2001:630:12:580:216:3eff:fe7f:153) ----> hcc-ps01.unl.edu (2600:900

Do not de-duplicate results

Topology beginning at Tue May 27 00:24:00 2014 (UTC +1)

Hop	Router	IP
1	hep-outside-hsrp1-slave.net.ic.ac.uk	146.179.246.253
2	te0-4-0-1.londsh-rbr1.ja.net	146.97.137.157
3	be2.londic-rbr1.ja.net	146.97.66.34
4	ae24.londpg-sbr1.ja.net	146.97.37.197
5	ae29.londhx-sbr1.ja.net	146.97.33.1
6	janet.mx1.lon.uk.geant.net	62.40.124.197
7	ae0.mx1.ams.nl.geant.net	62.40.98.81
8	ae0.mx1.fra.de.geant.net	62.40.98.128
9	abilene-wash-gw.mx1.fra.de.geant.net	62.40.125.18
10	et-9-0-0.115.rtr.chic.net.internet2.edu	198.71.45.56
11	ks-96-xe-11-3-3-100.greatplains.net	164.113.255.249
12	164.113.255.10	164.113.255.10
13	hcc-ps01.unl.edu	129.93.239.148

IPv4

Topology beginning at Tue May 27 00:26:35 2014 (UTC +1)

Hop	Router	IP
1	2001:630:12:580::2	2001:630:12:580::2
2	2001:630:0:9001::199	2001:630:0:9001::199
3	2001:630:0:1001:10::1	2001:630:0:1001:10::1
4	ae24.londtw-sbr1.ja.net	2001:630:0:10::23d
5	ae29.londtn-sbr1.ja.net	2001:630:0:10::1d2
6	ae0.lond-gw-ixp4.ja.net	2001:630:0:10::152
7	40ge1-3.core1.lon2.he.net	2001:7f8:4::1b1b:1
8	100ge1-1.core1.nyc4.he.net	2001:470:0:2cf::2
9	100ge7-2.core1.chi1.he.net	2001:470:0:298::1
10	wiscnet.v219.core1.chi1.he.net	2001:470:0:f2::2
11	2001:4e0:0:300c::2	2001:4e0:0:300c::2
12	2600:900:0:1::2	2600:900:0:1::2
13	hcc-ps01.unl.edu	2600:900:6:1101:7a2b:cbff:fe68:6238

IPv6

- SAM nagios is useful for functional tests - does a service actually work?
- Also wanted to do some stress testing, can the expected throughput actually be achieved over IPv6?
 - at FNAL they found the border router supporting offsite IPv6 connectivity jumped in CPU usage with IPv6 throughput
 - HEPiX gridftp tests copy 1 GB files between simple gridftp servers
 - HEPiX Phedex testbed more realistic but mainly for establishing functionality of Phedex with differing SE types
- Wanted a set up with the ability to carry out throughput tests over IPv6
- Not easy to use FTS transfers yet
 - currently only one or maybe two dual-stack production SEs
 - most IPv6-enabled SEs are only small VMs with limited storage space
- Copying to /dev/null on multiple WNs has potential to stress inbound data rates
- Also decided to try Big Panda as a workload management system (it uses http so should work over IPv6)
- So we submit jobs to dual-stack WN at Imperial (and now Brunel) and copy files in from several IPv6 enabled SEs

- Using the Auto pilot factory to send pilots
- Works with multiple VO's

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[Cloud ▾](#)
[Reports](#)
[Help](#)

Factory view

Factory UK-IC-v6ui00-drand
Version 2.3.2
Last startup 1 day ago
Email duncan.rand@imperial.ac.uk
Activity 0
Links [logs](#) [queues.conf](#)

Factory label	created	running	exiting	done	fault	last msg
UKI-LT2-Brunel-dc2-grid-26-nordugrid-condor-vo.londongrid.ac.uk	0	0	0	0	0	59 mins ago
UKI-LT2-IC-HEP-cetest00-grid.q-sge-dteam	0	0	0	0	0	59 mins ago
UKI-LT2-IC-HEP-cetest00-grid.q-sge-vo.londongrid.ac.uk	0	0	0	0	0	59 mins ago
UKI-LT2-IC-HEP-cetest01-grid.q-sge-vo.londongrid.ac.uk	0	0	0	0	0	59 mins ago
UKI-LT2-IC-HEP-v6ce00-all.q-sge-dteam	2	4	0	0	0	seconds ago
UKI-LT2-IC-HEP-v6ce00-all.q-sge-ipv6.hepix.org	0	0	0	0	0	59 mins ago
UKI-LT2-IC-HEP-v6ce00-all.q-sge-vo.londongrid.ac.uk	0	0	0	0	0	59 mins ago
UKI-LT2-QMUL-ce05-sl6_lcg_test-sge-dteam	1	0	0	0	0	1 min ago

- Have installed dual-stack BigPanda and BigPandamon instances
- Haven't yet encountered any IPv6 related issues
- Have run jobs on dual-stack and IPv6-only worker nodes

PanDA monitor | Dashboard ▾ | Jobs ▾ | Tasks ▾ | Errors ▾ | Users ▾ | Sites ▾ | Incidents ▾ | Search

PanDA dashboard, last 7 days. Query params:

This page summarizes recent job status for VOs, clouds and sites. Click on the numbers to see job listings. Failure rates above 10% are shown in red. Click the cloud name in the overall summary to go to the cloud's site summary. Click the job counts to go to job listings. Click on column titles to sort.

VO / Cloud / Site summary

VO summary														
VO		nJobs	% failed	assigned	throttled	activated	sent	starting	running	holding	transferring	finished	failed	cancelled
dteam		129		0	0	0	0	0	4	125	0	0	0	0
ipv6.hepix.org		9		0	0	0	0	0	0	9	0	0	0	0
vo.londongrid.ac		188		0	0	0	0	0	0	188	0	0	0	0

Cloud / Site summary of all jobs - Cloud view <small>For a description of cloud view see below</small>														
Cloud	Status	nJobs	% failed	assigned	throttled	activated	sent	starting	running	holding	transferring	finished	failed	cancelled
All clouds		326	0	0	0	0	0	0	4	322	0	0	0	0
UK		326		0	0	0	0	0	4	322	0	0	0	0

UK Cloud, Sites														
	Status	nJobs	% failed	assigned	throttled	activated	sent	starting	running	holding	transferring	finished	failed	cancelled
UK all sites including MCP		326		0	0	0	0	0	4	322	0	0	0	0
UKI-LT2-Brunel	test	4	0	0	0	0	0	0	0	4	0	0	0	0
UKI-LT2-IC-HEP	test	322	0	0	0	0	0	0	4	318	0	0	0	0

Help

This page summarizes recent job status for VOs, clouds and sites. Click on the numbers to see job listings. Failure rates above 10% are shown in red. Click the cloud name in the overall summary to go to the cloud's site summary. Click the job counts to go to job listings. Click on column titles to sort.



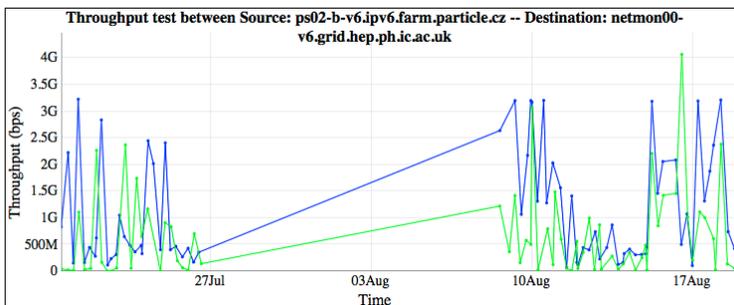
Brought to you by the PanDA team. All times are in UTC.
[PanDA monitor support](#) [PanDA home](#) [BigPanDA home](#)



- Initially ran jobs on the Imperial production dual-stack WN copying data in from small IPv6 test SEs:

- IPv6-only DPM at Oxford
- Dual-stack Storm SE at QMUL
- Dual-stack DPM at Brunel

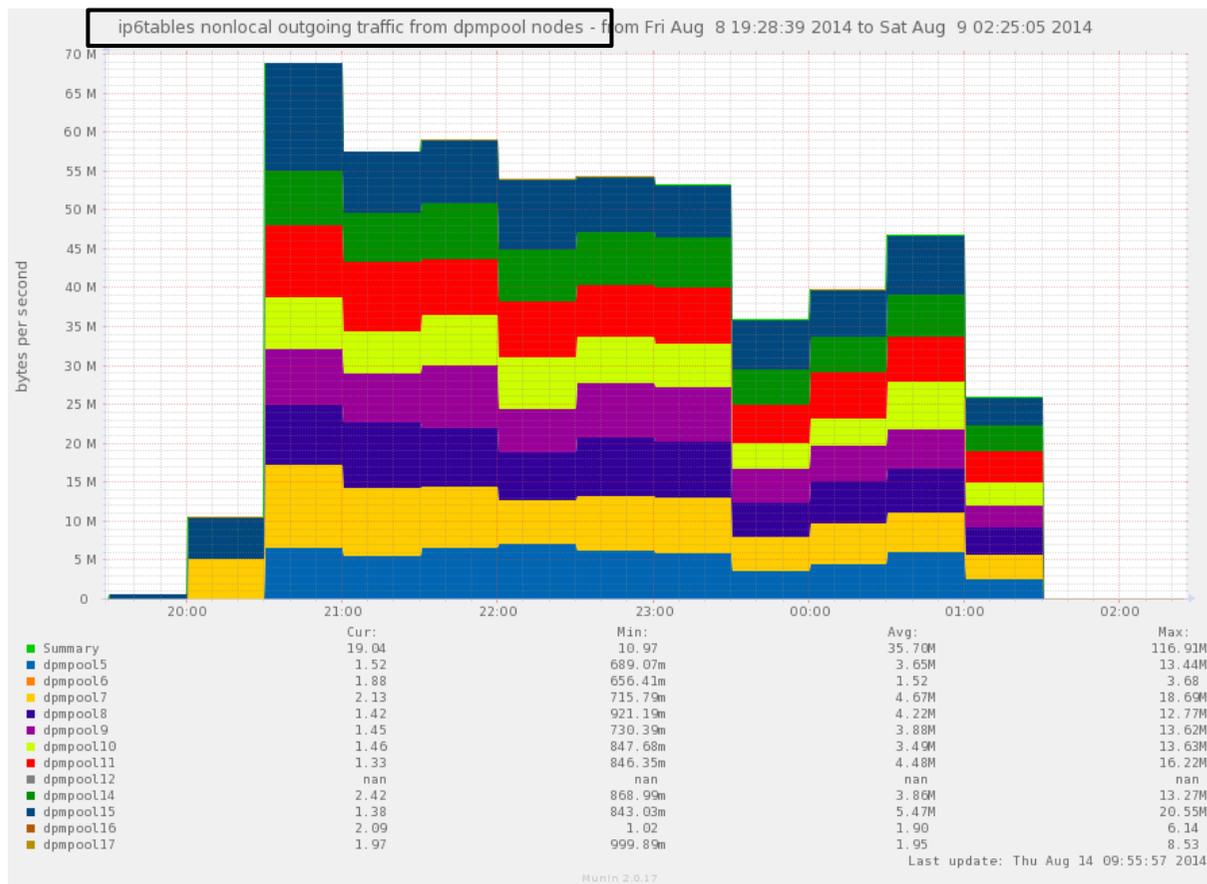
- Also used the dual-stack production DPM at FZU in Prague



Graph Key

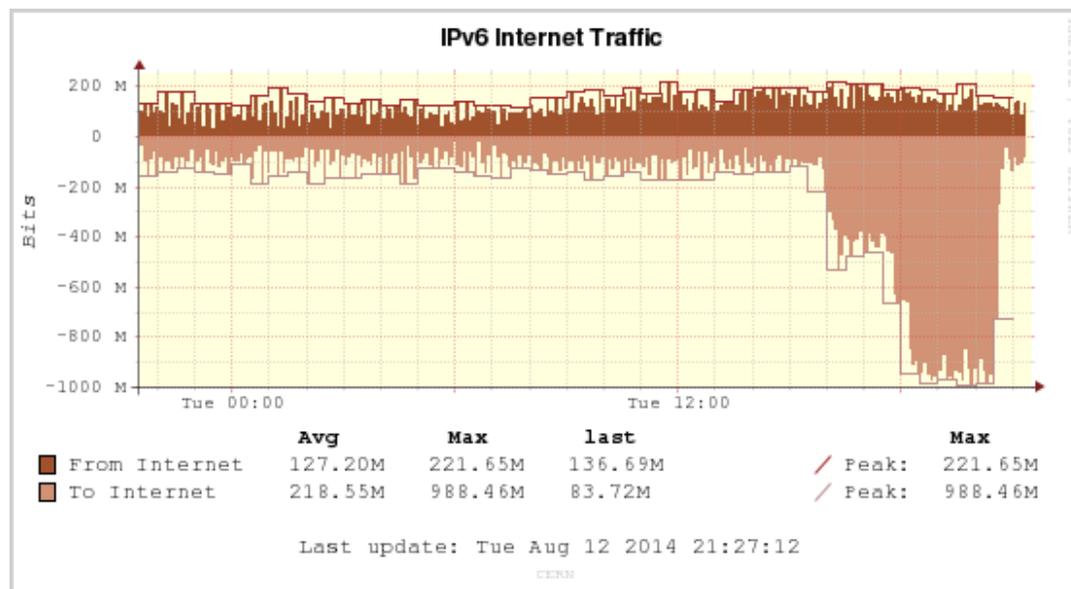
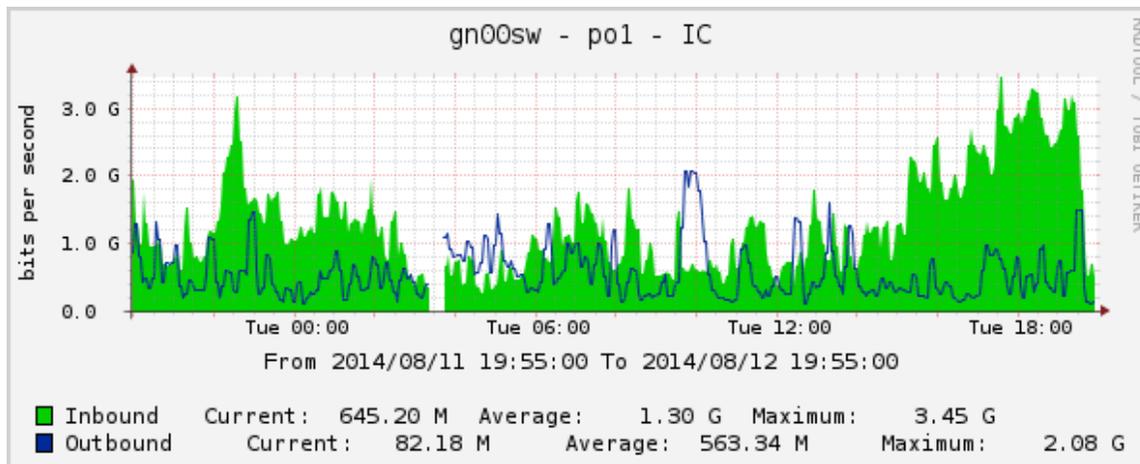
- Src-Dst throughput
- Dst-Src throughput

perfSONAR results





- Also tried running eight simultaneous jobs on our IPv6-only WN VM (connected at 10 Gbps) simultaneous copying from UK SEs and dual-stack development DPM at CERN
- Rate about 2.8 Gbps of which about 1 Gbps from CERN



- Xrootd4 over IPv6 from a DPM at CERN - fast: 102-114 MB/s

```
[drand1@v6ui00 ~]$ xrdcp -f -d 2 root://lxfkra04a04.cern.ch//dpm/cern.ch/home/dteam/dtr-testfile /dev/null 2>&1 | egrep "connection|2001"
[2014-08-15 13:37:22.599207 +0100][Debug ][PostMaster ] [lxfkra04a04.cern.ch:1094] Found 2 address(es): [2001:1458:301:a800::100:4]:1094, [::ffff:128.142.224.21]:1094
[2014-08-15 13:37:22.599233 +0100][Debug ][AsyncSock ] [lxfkra04a04.cern.ch:1094 #0.0] Attempting connection to [2001:1458:301:a800::100:4]:1094
[2014-08-15 13:37:22.614199 +0100][Debug ][AsyncSock ] [lxfkra04a04.cern.ch:1094 #0.0] Async connection call returned
[2014-08-15 13:37:22.836914 +0100][Debug ][PostMaster ] [lxfkra04a04.cern.ch:1095] Found 2 address(es): [2001:1458:301:a800::100:4]:1095, [::ffff:128.142.224.21]:1095
[2014-08-15 13:37:22.836936 +0100][Debug ][AsyncSock ] [lxfkra04a04.cern.ch:1095 #0.0] Attempting connection to [2001:1458:301:a800::100:4]:1095
[2014-08-15 13:37:22.851568 +0100][Debug ][AsyncSock ] [lxfkra04a04.cern.ch:1095 #0.0] Async connection call returned
[2014-08-15 13:37:33.925308 +0100][Debug ][Poller ] <[2001:630:12:580:216:3eff:fe7f:14f]:36491<--><[2001:1458:301:a800::100:4]:1094> Removing socket from the poller
[2014-08-15 13:37:33.925481 +0100][Debug ][Poller ] <[2001:630:12:580:216:3eff:fe7f:14f]:48475<--><[2001:1458:301:a800::100:4]:1095> Removing socket from the poller
```

```
[drand1@v6ui00 ~]$ time for i in {0..20}; do xrdcp -f root://lxfkra04a04.cern.ch//dpm/cern.ch/home/dteam/dtr-testfile /dev/null; done
```

```
[1024MB/1024MB] [100%] [=====] [102.4MB/s]
[1024MB/1024MB] [100%] [=====] [113.8MB/s]
[1024MB/1024MB] [100%] [=====] [102.4MB/s]
```

```
real    3m30.139s
user    0m9.572s
sys     1m50.770s
```

- Recent, brief, investigation into the IPv6 compatibility of Dirac server at Imperial
- Base machine is dual-stack but Dirac not binding to IPv6 addresses
- However, we did a 'find and replace' of `AF_INET` => `AF_INET6` in the code
- Now see IPv6 addresses in the logs... do we have a dual-stack Dirac server?
- Tweaked the `lighttpd` (“lighty”) web server to bind to IPv6, then closed IPv4 ports and opened IPv6 ports, effectively making it IPv6 only
- Applied same changes to the Dirac client on local dual-stack UI
- Uploaded a proxy and submitted a job over IPv6 from the UI (confirmed with `tcpdump`)
- Pilot job was submitted to `ceprod05.grid.hep.ph.ic.ac.uk` over IPv6 (confirmed in CE logs)
- Job ran, downloading pilot code over IPv4 from the web server at CERN

- But the code downloaded by the WN from CERN was unpatched and failed to connect back to the (now IPv6) Dirac server
- Preliminary conclusion: “It looks like DIRAC is written well enough for it to be trivial to enable IPv6”
- Incidentally, the pilot code was downloaded from lhcbproject.web.cern.ch over IPv4. This wouldn't work on an IPv6-only WN. However hosts at CERN often have an IPv6 address:

```
$ host lhcbproject.web.cern.ch
lhcbproject.web.cern.ch is an alias for webafslhcb.cern.ch
$ host webafslhcb.ipv6.cern.ch
webafslhcb.ipv6.cern.ch has IPv6 address 2001:1458:301:2c::100:57
$ nc -6 -v www.cern.ch 80 # we are connected over IPv6
Connection to www.cern.ch 80 port [tcp/http] succeeded!
^C
$ wget http://webafslhcb.ipv6.cern.ch/lhcbproject/dist/DIRAC3/installSource/DIRAC-v6r11p1.tar.gz
--2014-08-14 14:53:40--
http://webafslhcb.ipv6.cern.ch/lhcbproject/dist/DIRAC3/installSource/DIRAC-v6r11p1.tar.gz
Resolving webafslhcb.ipv6.cern.ch... 2001:1458:301:a880::100:89, 2001:1458:301:2c::100:56,
2001:1458:301:2c::100:57
Connecting to webafslhcb.ipv6.cern.ch[2001:1458:301:a880::100:89]:80... failed: Connection
timed out.
```

- A fraction of the network testing jobs to Imperial currently go to the Imperial IPv6-only CE (v6ce00) with its IPv6-only WN
 - hang whilst trying to contact the LFC at CERN which is IPv4-only
 - could use the Imperial LFC which is now dual-stack
 - would then hang whilst trying to download from any IPv4-only SE's
- Should work with dual-stack SE's however
- Could be interesting to use both IPv4 and IPv6 where they exist and create a table for IPv4 and a table for IPv6, much like the perfSONAR testbed
- By the way do we need a way to indicate when a CE has IPv6-only WN?

Ordered by averages

CE	Storage Element																	Ave	CE				
	T1-SE	SE-WN	Cam	Man	Lan	Ox	PPD	RHUL	Birm	Gla	Brun	Shef	Liv	UCL	Bris	Susx	JET			T1	Imp	QMUL	Ed
QMUL			375.1	130.3	107.6	53.8	431.7	70.5	28.3	22.4	67.1	26.7	15.1	20.7	20.8	4.4						83.1	QMUL
Gla			117.6	126.3	113.8	96.8	56.3	104.5	99.2	119.7	40.9	38.5	36.6	69.0	18.4	4.1						75.0	Gla
Man			95.2	133.8	94.3	100.2	142.6	79.8	91.7	73.5	49.0	46.0	43.9	25.4	16.4	3.4						70.7	Man
Ox			129.7	105.6	118.0	114.8	93.4	79.2	84.9	94.5	59.1	20.3	25.0	35.8	19.5	7.7						69.9	Ox
PPD			95.7	104.9	82.4	101.0	62.4	75.5	105.5	68.5	42.9	64.9	27.2	21.6		20.5						65.2	PPD
RHUL			125.0	87.2	76.5	104.2	32.2	118.9	63.7	83.0	51.5	10.5	31.9	18.3	21.8	20.0	5.2					62.1	RHUL
Cam			101.5	108.0	84.7	93.6	36.8	76.4	57.3	27.4	61.7	53.5	32.0	8.7	14.4							61.8	Cam
Lan			24.5	50.2	43.3	23.5	62.4	22.4	23.8	11.9	19.6	31.2	17.4	11.3	12.9							26.3	Lan
Brun			24.6	33.2	21.8	24.5	26.4	27.7	21.9	6.7	90.0	7.9	4.6	21.0	10.1							23.9	Brun
Liv			10.1		4.3	4.1	11.2	9.8	19.7	6.7	11.3	4.5	132.4		7.9	4.1						22.9	Liv
JET			21.5	26.1	13.3	21.9	27.7	28.0	16.1	19.4	27.3	16.8	19.7	24.8	15.3							21.4	JET
Shef			12.5	28.4	20.7	12.5	16.7	9.1	13.7	18.7	10.4	98.5	10.1	10.9	6.5							20.9	Shef
T1																							T1
Imp																							Imp
UCL																							UCL
Ed																							Ed
Birm																							Birm
Bris																							Bris
Susx																							Susx
Ave			89.5	82.6	64.9	62.8	62.6	58.3	50.5	46.9	44.8	34.7	30.1	25.5	21.8	15.7	4.9					50.5	Ave

Code: 0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 MB/s

- IPv6 uptake by UK universities central IT services appears to remain slow
- Nevertheless a core of UK GridPP sites namely Brunel, Glasgow, Imperial, Oxford and QMUL are in the process of enabling IPv6
- The remainder of GridPP sites are in discussion with their local IT staff and several are at the stage where they are ready to proceed
- Work on monitoring proceeds with a perfSONAR dashboard and SAM Nagios instance
- Dirac and Big Panda workload management systems look positive with respect to IPv6
- Some simple stress testing has been carried out