The HEPiX IPv6 Working Group

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WLCG GDB, CERN

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Outline

Update of status and plans

- F2F meeting of IPv6 WG – CERN 23/24 Jan 2014

- HEPiX IPv6 testing news

- Acknowledgement/forgiveness for sites who test dual-stack services in production

- Software and tools survey
  - dCache status

- Survey of sites

- 1st Workshop to encourage dual-stack services
  - Pre-GDB at CERN on 10 June 2014

IPv6 F2F meeting 23/24 Jan

- Agenda included
  - In addition to standard items
  - IPv6, CERN Cloud and OpenStack
    - Luis Fernandez Alvarez
    - OpenStack Havana cannot control IPv6 traffic
    - CERN having to develop its own controls
    - Longer term – OpenStack Neutron – Networking as a service
  - Revisions to CHEP2013 paper
    - Resubmitted and now accepted

Other news from meeting

- CERN news
  - Progressing well with IPv6 deployment
  - Firewall and DNS ready
  - Aiming to deploy campus-wide in March
  - Still some problems with dhcpv6
- Xrootd V4 still not available (still true?)
- DESY – problems with dhcpv6 fixed
  - Now ready for deployment
- KIT building IPv6 test cluster
- Duncan Rand – news from Imperial – see slides
  - Includes news about PerfSonar (dual stack? separate endpoints?)

IPv6 file transfer tests

- Tony Wildish (CMS)
- Successful mesh of transfers before CHEP2013
  - GridFTP and UberFTP
- Left unattended
- Lots of sites were broken
  - A variety of unrelated issues – now fixed
  - E.g. globus port range not being set after upgrade
  - Not a problem with IPv6

ATLAS testing

- Alastair Dewhurst (ATLAS, RAL)
- AGIS
  - Flags added for IPv6 support on storage endpoints
- Start with simple data movement tests
  - globus_url_copy, lcg commands
- Then data tests using HammerCloud
- Frontier service
  - Squid 2.8 is non IPv6 compatible
    - Squid 3.1 at Tier 2s should be usable

Next steps in testing

- Once gridftp mesh is working again
- KIT, PIC, FZU, NDGF
  - PhEDEx/SRM/dCache tests (on testbed)
- Then move to use of SRM/FTS/PhEDEx
  - With various **production** endpoints
  - Volunteer sites
- We need clearly defined use case (from expts)
  - CERN Worker Node/Virtual Machine IPv6-only
  - What WLCG services outside CERN need to be dual-stack?

Forgiveness/Compensation?

- As we move to dual-stack IPv6 testing on production services ...

- Some sites say they will only join if it is accepted by WLCG, by Expts, by Funding agencies that their availability might suffer
  - Either because of service problems
  - Or because sys admin effort is busy on IPv6

- Very similar to middleware testing

- Simone Campana is preparing paper on this for WLCG MB

Software and Tools survey …

IPv6 compliance of WLCG applications

Software Component	Type	Used by Experiment	Version	IPv6 Compliance
AliEN	LHC Experiment Application	ALICE		
ARC CE	Middleware	ATLAS, CMS		YES
ARGUS	Middleware	ALICE, ATLAS, CMS, LHCb		Unknown
BDII	Middleware	ATLAS, CMS, LHCb	EMI 2	YES
BestMAN	Middleware	ATLAS, CMS		Unknown
CASTOR	Middleware	ALICE, ATLAS, CMS, LHCb		NO
cfengine	Monitoring			Unknown
CMS Tag Collector	LHC Experiment Application	CMS		Unknown
CMSSW	LHC Experiment Application	CMS		Unknown
cmsweb	LHC Experiment Application	CMS		Unknown
CRAB 2	LHC Experiment Application	CMS		Unknown
Cream CE	Middleware	ALICE, ATLAS, CMS, LHCb	1.16.2	YES
CVMFS	Other Application	ALICE, ATLAS, CMS, LHCb		YES
Dashboard Google Earth	Monitoring	ALICE, ATLAS, CMS, LHCb		Claimed

Software survey (2)

dCache	Middleware	ALICE, ATLAS, CMS, LHCb	2.6.19	Claimed
dCache	Middleware	ALICE, ATLAS, CMS, LHCb	1.9.12	NO
DIRAC	LHC Experiment Application	LHCb		Unknown
DPM	Middleware	ALICE, ATLAS, CMS, LHCb		YES with caveats
EGI Accounting Portal	Monitoring	ALICE, ATLAS, CMS, LHCb		Unknown
EOS	Middleware	ALICE, ATLAS, CMS, LHCb		NO
Experiment Dashboards	Monitoring	ALICE, ATLAS, CMS, LHCb		Unknown
Frontier	LHC Experiment Application	ATLAS, CMS		NO
FTS	Middleware	ATLAS, CMS, LHCb	FTS 3	YES
Ganglia	Monitoring			YES
GFAL/lcg_util	Middleware	ALICE, ATLAS, CMS, LHCb		Claimed
glideinWMS	Middleware	CMS		Claimed
globus toolkit	Middleware	ALICE, ATLAS, CMS, LHCb	5.2.5	YES
GOCdb	System Management Tool	ALICE, ATLAS, CMS, LHCb		Unknown
Gratia Accounting	Monitoring			Unknown
Gridsite	Middleware			Claimed
Gstat	Monitoring			Unknown

Software survey (3)

GUMS	Middleware	ATLAS, CMS		Unknown
Hadoop	Middleware	ATLAS, CMS		NO
HammerCloud	LHC Experiment Application	ATLAS, CMS, LHCb		Unknown
HTCondor	Middleware	ATLAS, CMS		YES with caveats
iCMS	LHC Experiment Application	CMS		Unknown
LFC	Middleware	ATLAS, LHCb	1.8.7	YES
MonALISA	Monitoring			Claimed
MyOSG	Monitoring			Unknown
MyProxy	Middleware		EMI 1	Unknown
MyWLCG	Monitoring	ALICE, ATLAS, CMS, LHCb		Unknown
Nagios	Monitoring	ALICE, ATLAS, CMS, LHCb		Claimed
OpenAFS	Other Application	ALICE, ATLAS, CMS, LHCb	Last	NO
PanDA	LHC Experiment Application	ATLAS, CMS		Unknown
perfSONAR	Monitoring	ATLAS, CMS		YES
PhEDEx agents	LHC Experiment Application	CMS		YES
Puppet	System Management Tool	ALICE, ATLAS, CMS, LHCb		YES
REBUS	Monitoring	ALICE, ATLAS, CMS, LHCb		Unknown

Software survey (4)

REBUS	Monitoring	ALICE, ATLAS, CMS, LHCb		Unknown
SAM	Monitoring	ALICE, ATLAS, CMS, LHCb		Unknown
Scientific Linux	Operating System	ALICE, ATLAS, CMS, LHCb	5.7	YES
SDT IB and QA pages	LHC Experiment Application	CMS		Unknown
Squid	Other Application	ALICE, ATLAS, CMS, LHCb	2.8	NO
Squid	Other Application	ALICE, ATLAS, CMS, LHCb	3.1	YES
StoRM	Middleware	ALICE, ATLAS, CMS, LHCb	1.11.2	YES with caveats
Ticket system -- GGUS	System Management Tool	ALICE, ATLAS, CMS, LHCb		Unknown
various D web tools	LHC Experiment Application	CMS		Unknown
VOMS	Middleware	ALICE, ATLAS, CMS, LHCb	2.0.11	YES
VOMS-Admin	Middleware	ALICE, ATLAS, CMS, LHCb	2.0.11	YES with caveats
WLCG squid monitoring	Monitoring	ATLAS, CMS		Claimed
WMAgent	LHC Experiment Application	CMS		Unknown
WMS	Middleware	ALICE, ATLAS, CMS, LHCb	EMI 2	Unknown
xrootd	Middleware	ALICE, ATLAS, CMS	3.1.0	NO
xrootd	Middleware		4.0.0	Claimed

What has/will change(d)?

- Descriptions of yes/no etc needed on web
  - *Yes* = we have tested
  - *Yes with caveats* = needs configuration or works only in a subset of protocols/configs
  - *Claimed* = by developers but not yet tested
  - *Unknown* = ticket submitted to developers
  - *Blank* = not even started investigation
- Click on product for details
  - See example on next slide

Example: status of Frontier

Name of Supplier and/or Developer:

Dave Dykstra

Does developer claim IPv6 compliance?:

No

Did you try running on dual stack system?:

No

Does it bind to both stacks?:

No

Is IPv6 preferred by default?:

No

Can it be configured to prefer IPv6 or IPv4?:

No

More information and/or link(s) to ticket(s):

Fronter is not IPv6 compliant and there's a pretty big obstacle in its way. squid3 is IPv6 compliant, but it is missing two important features so we can't yet use it. Apparently one of them (collapsed forwarding) has been implemented but not yet released, but the other (If-Modified-Since support, the famous squid bug #7) is top on their priority list of features that are not yet staffed. I am expecting that if they don't get to it by early next year, I'm going to have to put significant time into contributing the implementation of that feature to the squid project. In addition, I'm pretty sure the frontier client is not completely IPv6 compliant, but I don't expect that to be a significant amount of work to fix. The frontier tomcat server doesn't matter because it is only accessed via localhost from squid. It does access the DB on its backend but I am assuming that since that's always on a LAN that an IPv4 address will be available if JDBC has a problem with IPv6. Googling indicates that IPv6 is supported starting with Oracle 11gR2 along with the associated JDBC driver from them, so it should be fine in any case. (Dave Dykstra, 7/11/2013)

dCache & IPv6

- Pre-release of dCache 2.8.0 tested at NDGF
  - IPv6 fixes will not be backported to V2.6
- Seems to work
  - BUT all Gridftp-1, thus proxied via the FTP door instead of the data being sent from client directly to the pool
- dCache uses the response to the PASV FTP command to steer data connections to a pool of servers for load balancing
  - And obeying RFC2428 which says protocol and host fields of the EPSV response "MUST be blank" (for NAT)
- But Globus, jGlobus, Uberftp clients *do* parse these fields
- Discussions ongoing with dCache team

Next steps

- Survey of all WLCG sites
  - When will they run out of IPv4 addresses
  - When will they be capable of IPv6 support
- We mentioned summer IPv6 workshop
- We prefer a one-day pre-GDB meeting
  - 10 June 2014 at CERN
  - Aimed primarily at Tier 1 sites (others welcome)
  - Encourage IPv6 support
  - Move to dual-stack WLCG services
  - Testing needs to move to production services

Next IPv6 meetings

- 13 Feb 2014 - Vidyo

- 13 Mar 2014 - Vidyo

- 10/11 April 2014 - F2F at CERN

- Pre-GDB (full day) on 10 June at CERN

Further info

- HEPiX IPv6 web

http://hepix-ipv6.web.cern.ch

- HEPiX IPv6 wiki

https://w3.hepix.org/ipv6-bis/

- Working group meetings

http://indico.cern.ch/categoryDisplay.py?categId=3538

- WLCG Operations IPv6 Task Force

http://hepix-ipv6.web.cern.ch/content/wlcg-ipv6-task-force-0

Questions?