News from the HEPiX IPv6 Working Group
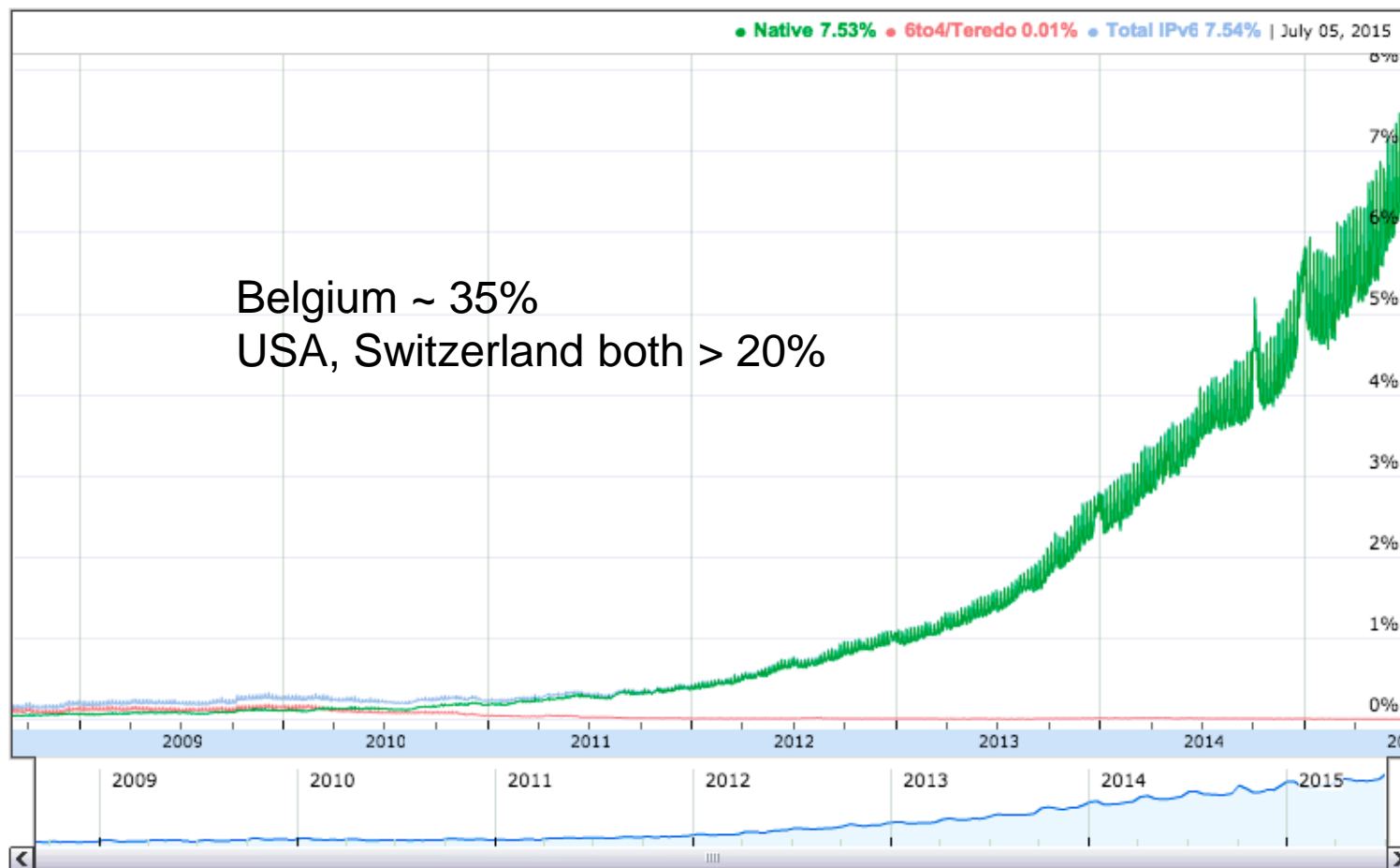
David Kelsey (STFC-RAL)

WLCG GDB, CERN

8 July 2015

Outline

- IPv6/IPv4 address space – global news
- News from the working group (June 2015)
- Data transfer testbed
- Dual-stack production services
- perfSONAR and IPv6
- LHCOPN/ONE and IPv6

IPv6 growth
(global Google clients)

Belgium ~ 35%
USA, Switzerland both > 20%

IPv4 address exhaustion

This report generated at 06-Jul-2015 08:10 UTC.

IANA Unallocated Address Pool Exhaustion:
        03-Feb-2011

Projected RIR Address Pool Exhaustion Dates:

RIR	Projected Exhaustion Date	Remaining Addresses in RIR Pool (/8s)
APNIC:	19-Apr-2011 (actual)	0.6877
RIPE NCC:	14-Sep-2012 (actual)	1.0045
LACNIC:	10-Jun-2014 (actual)	0.1635
ARIN:	09-Jul-2015	0.0080
AFRINIC:	13-Apr-2019	2.5823

RIR IPv4 Address Run-Down Model

Projection of consumption of Remaining RIR Address Pools
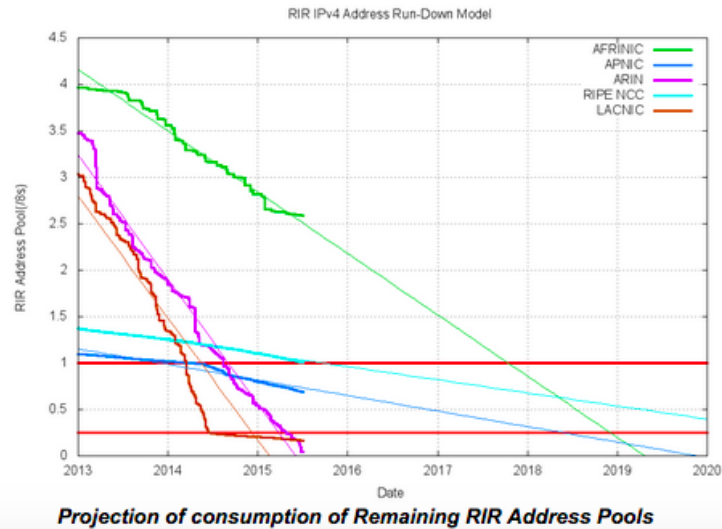
News from the group (June)

- Still IPv6 routing problems at CNAF (fixed?)

- Francesco Prelz started work on XRootD for testbed

- ATLAS – Oxford & Glasgow IPv6 Space Tokens started receiving test transfers

- Experiments – concentrating on Run 2!

- PIC
  - in contact with Enstore developers – date for IPv6?
  - New firewall configured for IPv6
  - Dual-stack offices network

News (2)

- DESY & KIT now enabled IPv6 on LHCONE

- DESY enabled IPv6 on eduROAM

- RAL working on Ceph S3 storage gateway

- LHCb – Dirac v6r13 now released and being tested

- FTS3 test system at KIT not working (see later)

- Progress on LHCOPN in USA

- NDGF about to move to dual-stack
  - National IPv6 day for mobiles
    - Went from 10K to 4M IPv6 devices overnight
  - Problems rebooting dCache headnodes

Testbed data transfers

- FTS3 at KIT
  - dCache endpoints in several sites
  - Other technologies later (StoRM, XRootD)

- Problems with FTS3
  - Gfal-copy fails to use IPv6
  - Coincident with upgrade in gfal2
    - And some problems FTS3 and dCache (not IPv6)
  - Downgraded but still problems
 - In the end wqs found to be a Globus upgrade

Dual-stack production services

- Several sites in the IPv6 working group have been testing dual-stack services in production
  - Including storage endpoints
- To check
  - Does the service over IPv4 continue to work?
  - Does it bind to both IPv4 and IPv6?
  - Is IPv6 preferred by default?
  - Can the choice be configured?
- We need more of this controlled testing
  - To date there have been no big problems

Deployed dual-stack on WLCG

Percentage of dual-stack endpoints In central CERN BDII
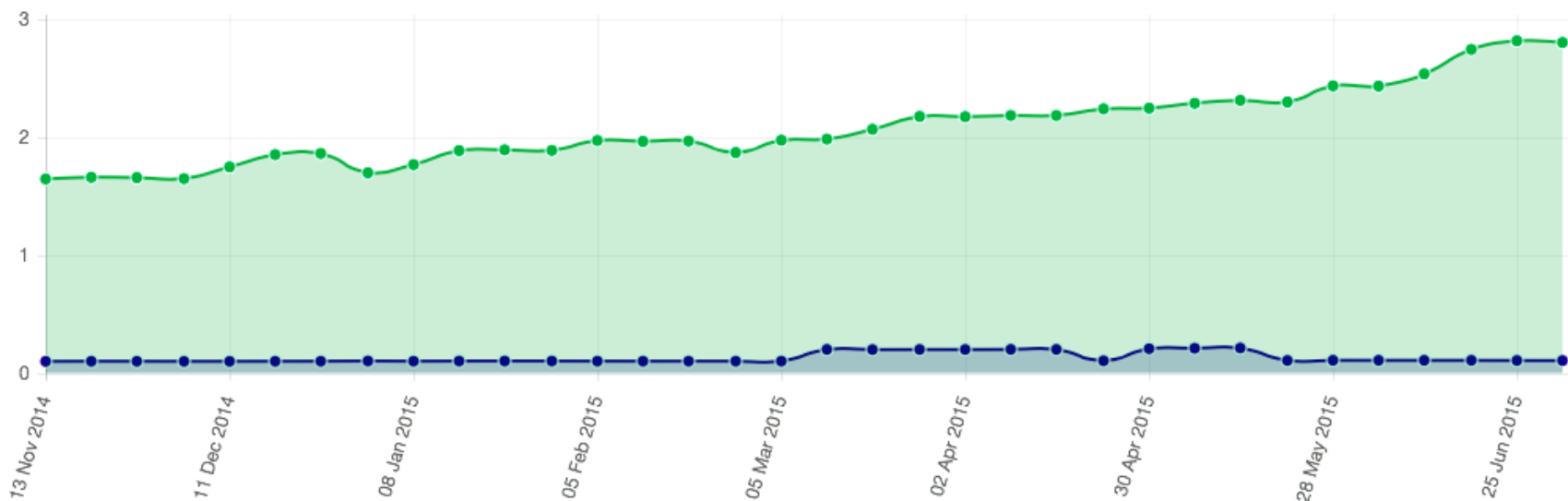
Experiment IPv6 Requirements

ATLAS (GDB Oct 2014)

- Request that all Tier 1s provide a dual stack PerfSONAR machine by April 2015

- Request that T2Ds provide a dual stack PerfSONAR machine by August 2015

- All to get sites ready to host dual-stack data services (FAX)

CMS (GDB Sep 2014)

- Request to have a substantial fraction of CMS data accessible via AAA through IPv6 by end 2015 - to use from IPv6-only WN

perfSONAR
Dual-Stack dashboard

http://maddash.aglt2.org/
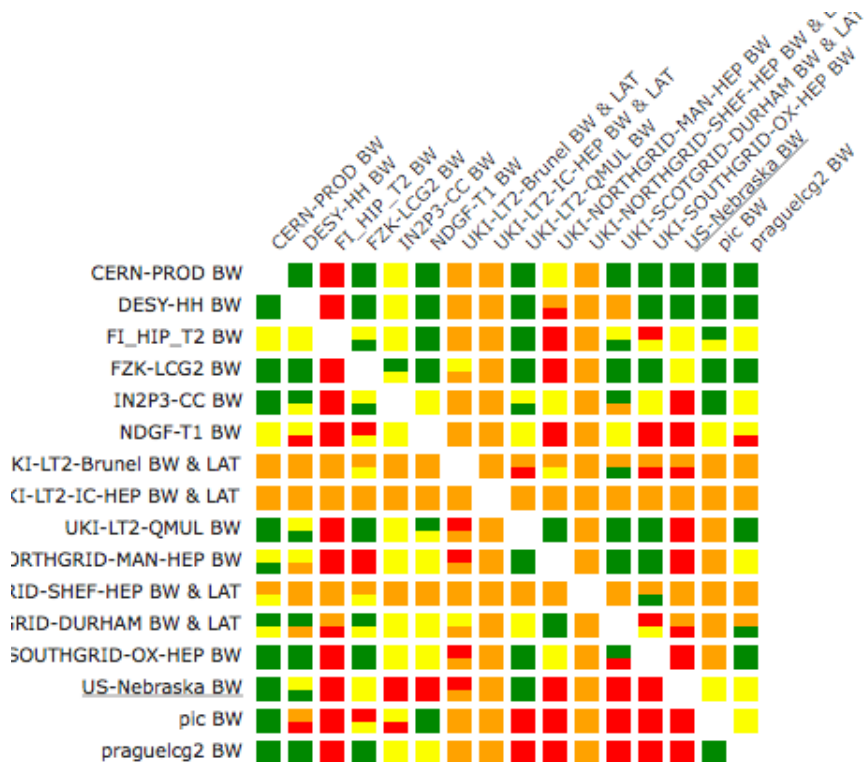
Warning: IPv6 currently showing same as IPv4 – will be fixed!

perfSONAR & WLCG Tier 0/1s?

Dual-stack IPv6/IPv4	IPv4 only	None?
CERN-PROD IN2P3-CC FZK-LCG2 NDGF-T1 pic	TRIUMF-LCG2 INFN-T1 SARA-MATRIX KR-KISTI-GSDC-01 Taiwan-LCG2 RAL-LCG2 USCMS-FNAL-WC1 BNL-ATLAS	NIKHEF-ELPROD RRC-KI-T1 JINR-T1

LHCOPN and IPv6

- Latest news (yesterday) from Bruno Hoeft

Tier-1s still missing:

- NL-T1:not priority #1, but they plan it in near future or by end of this year

- BNL: no comitment yet

- FNAL: within the coming two months (from end of May) – already happened?

LHCOPN(2)

- ASGC: no news
- Triumf: will implement IPv6 by end of the year
- RAL: a couple of months
- Russian sites have other obstacles to solve
  - RRC-KI & JINR
- INFN: LHCONE connected, but not to LHCOPN

Next Steps

- Add XRootD to testbed
- More robust production dual-stack testing
  - But need all LHCOPN links enabling IPv6
- Need perfSONAR monitoring on IPv6
  - Enabled at Tier 1s and dashboard IPv6/IPv4
- Dual-stack SAM testing
- Another workshop/training event
  - early 2016?

Links

- 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

- Paper published in proceedings of CHEP2013

Questions?