

# *WLCG and support for IPv6-only CPU – update*

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WLCG MB, CERN

20 Sep 2016

# Outline

- Reminder - plans presented to June 2016 GDB and July 2016 Management Board
- News since July
  - LHCOPN/LHCONE
  - Dual-stack perfSONAR
  - Tier 1 Summary (ATLAS)
- Plans clarified
  - Presented and discussed at GDB 14 Sep 2016
  - Today seeking approval for the plan
    - to keep up momentum

# WLCG IPv6 deployment strategy

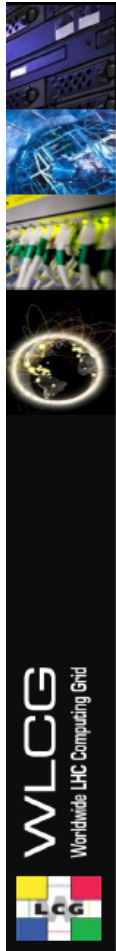
Alastair Dewhurst  
Andrea Sciabà  
on behalf of the HEPiX IPv6 WG

19/07/2016, WLCG MB



# Introduction

- IPv6 requirements of the experiments have been discussed at the last GDB.
- A document has been submitted to the MB for **approval**.
  - A summary is presented here.
- The main aims:
  - To provide a viable migration path for sites needing to switch to IPv6.
  - To allow sites to make long term planning decisions regarding their network setup.
  - To allow VOs to make use of IPv6-only CPU resources should they become available in future.



# Proposed timeline

- By April 1<sup>st</sup> 2017
  - Sites can provide IPv6-only CPUs if necessary
  - Tier-1's must provide dual-stack storage access with sufficient performance and reliability
    - At least in a testbed setup
  - Stratum-1 service at CERN must be dual-stack
  - A dedicated ETF infrastructure to test IPv6 services must be available
  - ATLAS and CMS must deploy all services interacting with WNs in dual-stack
  - All the above, without disrupting normal WLCG operations
- By April 1<sup>st</sup> 2018
  - Tier-1's must provide dual-stack storage access in production with increased performance and reliability
  - Tier-1's must upgrade their Stratum-1 and FTS to dual-stack
  - The official ETF infrastructure must be migrated to dual-stack
  - GOCDB, OIM, GGUS, BDII should be dual-stack
- By end of Run2
  - A large number of sites will have migrated their storage to IPv6
  - The recommendation to keep IPv4 as a backup will be dropped

# WLCG MB – 19 July 2016

- Some concerns about the aggressiveness of the plan
  - E.g. implications on CERN Tier 0 storage operations
- the real target is to have a reasonable fraction of services on IPv6 by LS2
  - but we need a fairly aggressive schedule to get there
- Action on the Tier0 and the Tier1 sites to analyse the implications of the document, to be ready for discussion at the next MB



# News since July 2016

Some slides shown at LHCOPN meeting (Helsinki) 19 Sep 2016



## LHC[OPN/ONE] → IPv6 → status

Bruno Hoeft / DE-KIT

STEINBUCH CENTRE FOR COMPUTING - SCC



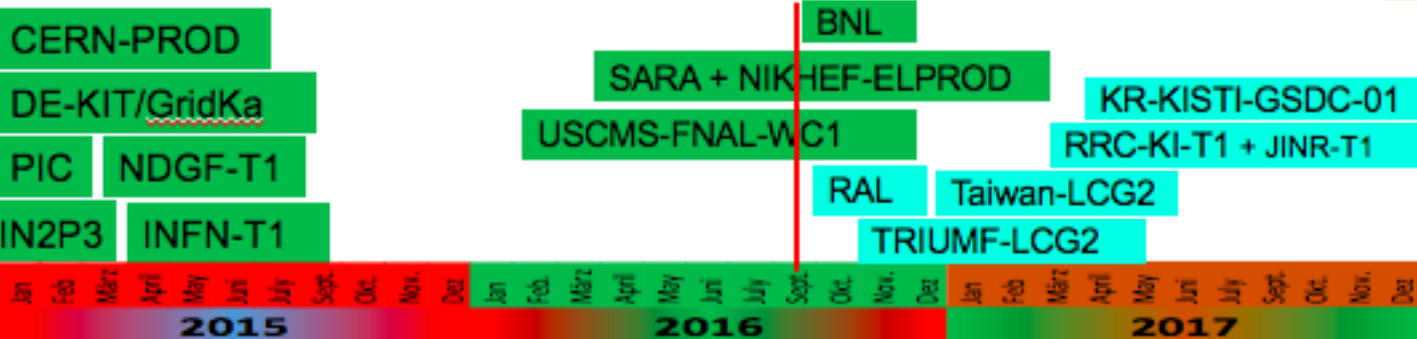
KIT – Universität des Landes Baden-Württemberg und  
nationales Forschungszentrum in der Helmholtz-Gemeinschaft

[www.kit.edu](http://www.kit.edu)



# IPv6 tier-1 site readiness ticket status at Monday 19. Sept.

Ticket-ID	Type	VO	Site	Priority	Resp. Unit	Status	Last Update	Subject	
121895		none	BNL-ATLAS	very urgent	OSG(Prod)	solved	2016-09-14	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121895		none	USCMS-FNAL-WC1	very urgent	OSG(Prod)	closed	2016-05-21	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121894		none	RAL-LCG2	top priority	NGI_UK ▶ assigned	closed	2016-06-30	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	ok
121893		none	Taiwan-LCG2	top priority	ROC_AsiaPacific	closed	2016-06-30	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	ok
121892		none	SARA-MATRIX	top priority	NGI_NL	closed	2016-06-30	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121891		none	RRC-KI-T1	top priority	ROC_Russia ▶ assigned	closed	2016-05-30	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	ok
121890		none	NIKHEF-ELPROD	top priority	NGI_NL	closed	2016-05-15	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121889		none	NDGF-T1	top priority	NGI_NDGF	closed	2016-06-16	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121888		none	KR-KISTI-GSDC-01	top priority	ROC_AsiaPacific	closed	2016-06-30	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	ok
121887		none	JINR-T1	top priority	ROC_Russia	closed	2016-06-30	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	ok
121886		none	INFN-T1	top priority	NGI_IT	closed	2016-05-15	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121885		none	IN2P3-CC	top priority	NGI_FRANCE	closed	2016-05-15	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121884		none	pic	top priority	NGI_IBERGRID	closed	2016-06-15	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121883		none	FZK-LCG2	top priority	NGI_DE	closed	2016-06-15	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121882		none	CERN-PROD	top priority	ROC_CERN	closed	2016-06-23	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	✓
121881		none	TRIUMF-LCG2	top priority	ROC_Canada	closed	2016-05-21	Tier-1 LHCOPN IPv6 Peering, incl. dualst...	ok



IPv6 peering + dual stack personal

work in progress

no response



Dual-Stack Mesh Config - IPv4 Bandwidth Test    Dual-Stack Mesh Config - IPv6 Bandwidth Test

■ Throughput >= 900Mbps   
 ■ Throughput < 900Mbps   
 ■ Throughput <= 500Mbps   
 ■ Unable to retrieve data   
 ■ Check has not yet run



<http://maddash.agit2.org/maddash-webui/index.cgi?dashboard=Dual-Stack%20Mesh%20Config>

# HEPiX IPv6 WG F2F

## HEPiX IPv6 Working Group F2F meeting

- At CERN on 6/7 September 2016
  - <http://indico.cern.ch/event/561262/>
- **Feedback from Tier 0/1 since MB in July**
  - No complaints
  - Reporting good progress in some cases
  - CERN, CNAF and RAL now more engaged with the working group

# Tier 1 summary (ATLAS)

- NDGF-T1: Happy with the IPv6 only CPU proposal and have already met dual stack requirements. The dCache storage and some of the computing resources are already dual stack.
- PIC: Happy with the IPv6 only CPU proposal and have already met dual stack requirements. Their dCache storage has been dual stack since April 2016. Performance is at the same level or better than via IPv4.
- IN2P3: In good shape to be able to provide the dual stack storage services according to the proposed time line.
- RAL: Happy with the IPv6 only CPU proposal. The IPv6 testbed should meet be requirements of the April 1st 2017 deadline. RAL are working on providing production quality endpoints significantly before the April 2018 deadline.
- Triumph: Deployed IPv6 in September 2016. Currently running just perfSonar dual stack box. Currently working on an IPv6 deployment timeline, so unable to comment on if they will meet deadlines.
- SARA-MATRIX: In process of preparing for data centre move in October 2016. They will look into it after this.
- FZK: No official feedback. GGUS ticket is marked as in progress. Bruno Heft is active member of HEPiX IPv6 working group.
- Taiwan-LCG2: No official feedback. GGUS ticket is marked as in progress.
- RRC-KI-T1: No official feedback. GGUS ticket is marked as in progress.
- NFN-T1: No official feedback. No response to GGUS ticket.
- NIKHEF-ELPROD: No official feedback. No response to GGUS ticket.
- BNL: No official feedback. No response to GGUS ticket.

# Other news

- BNL now peering IPv6 over LHCOPN
- FNAL reports (to CMS) progress to dual-stack storage
- Dual-stack perfSONAR – new sites
  - BNL
  - RAL
  - TRIUMF

# Clarification of IPv6-only paper

- Comments on Executive Summary
  - Tier 1s “required” to provide dual-stack storage
  - *Not necessarily all storage and can be via testbed and/or dual-stack gateway (with reduced performance/reliability) for 1<sup>st</sup> year*
  - Discussions with Tier 0 and CERN storage
  - Reminder – any site using pledged IPV6-only resources needs to discuss/agree with working group and VO to check workflow proposed (e.g. not ALICE)
- To achieve a significant IPv6-capability by LS2 we need to keep up the momentum
  - We must encourage the Tier 2s more
  - We still ask for MB approval of the April 2017 date!

# Questions?