# IPv6 transfers for CMS during DC24

A. Sciabà

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# Global view

- Efficiency (=success rate) very high for both IPv4 and IPv6
  - Very low for transfers with "unknown" IP protocol (see later)
- The vast majority of the transfers used IPv6
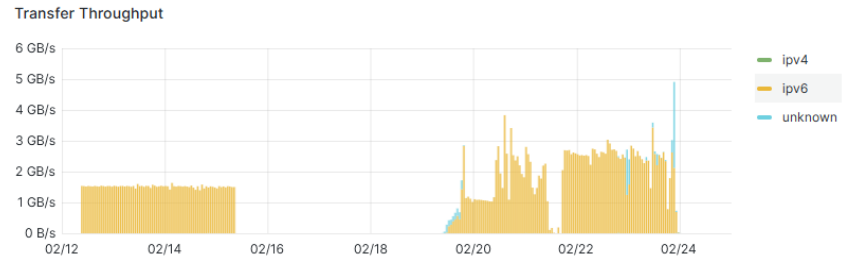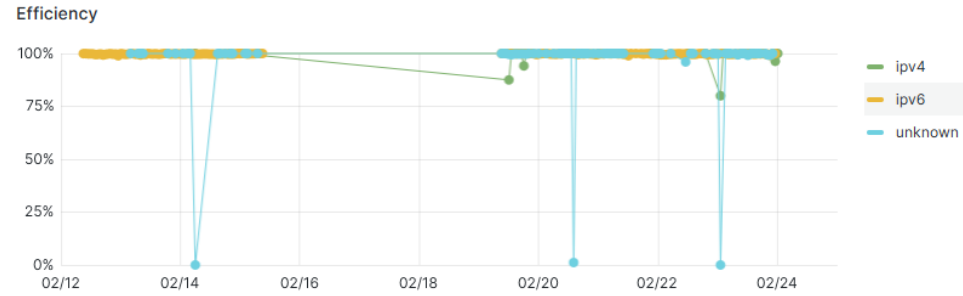
- Let's dig down…

# T0 → KIT

- Almost no IPv4 transfers at all

- During three periods, IP version could not be determined
  - Also for successful transfers
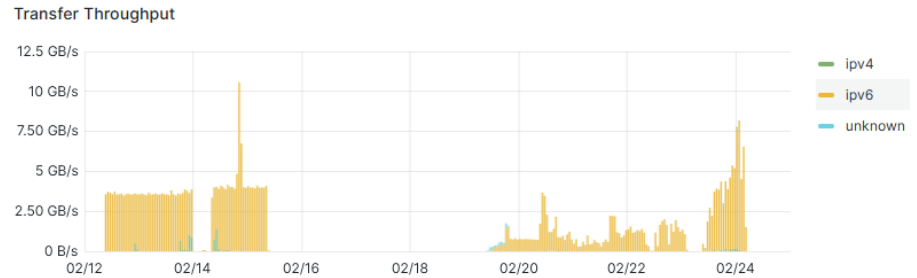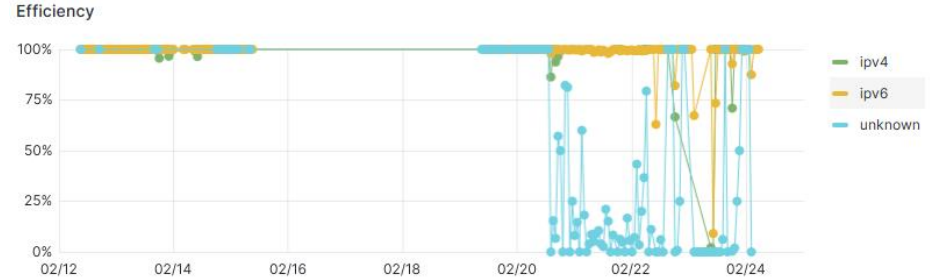  - Underlying cause still unknown

Efficiency

ipv4
ipv6
unknown

Transfer Throughput
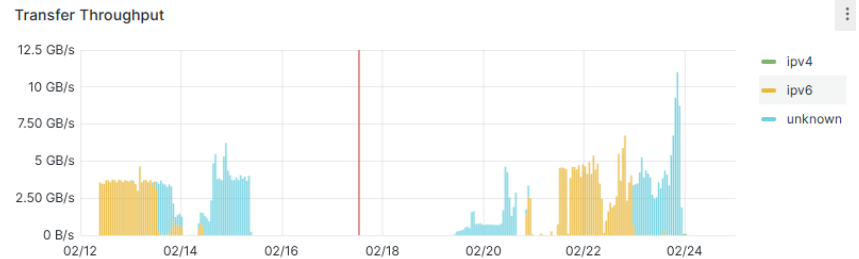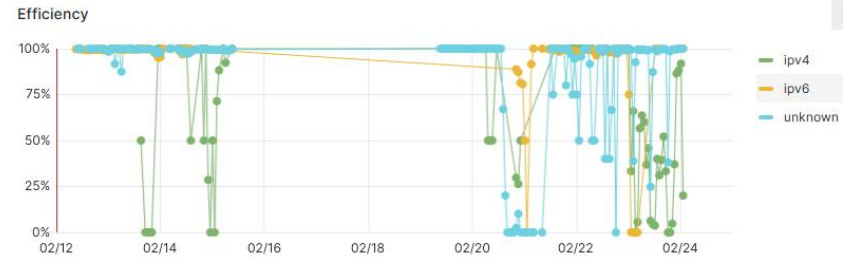
ipv4
ipv6
unknown

# T0 → PIC

- No IPv4 transfers!

- Practically no failures at all!

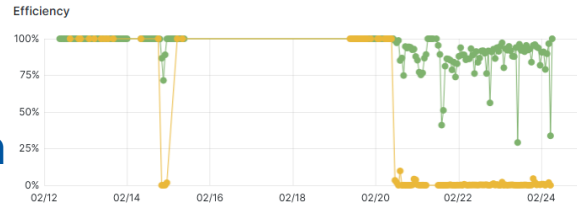**Efficiency**



**Transfer Throughput**

# T0 → IN2P3

- Negligible number of IPv4 transfers
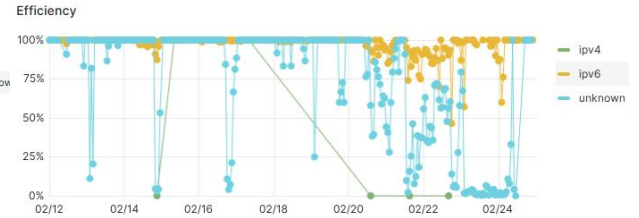
- Very few failures

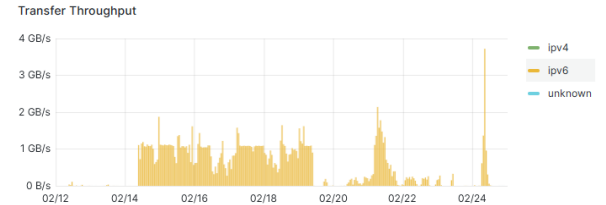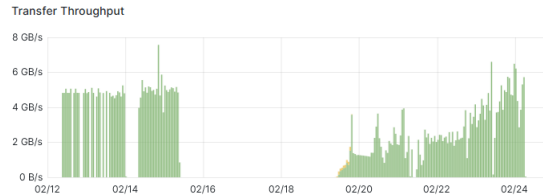  - "unknown"

# T0 → CNAF → T0

- <u>All</u> transfers to CNAF via IPv4!
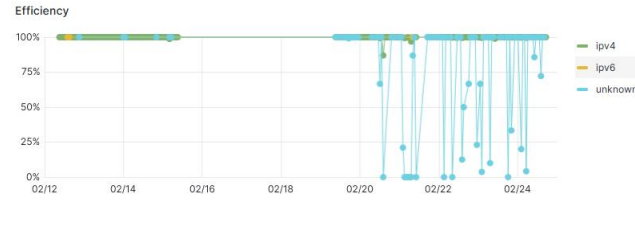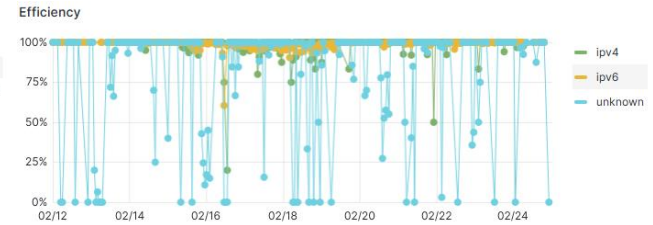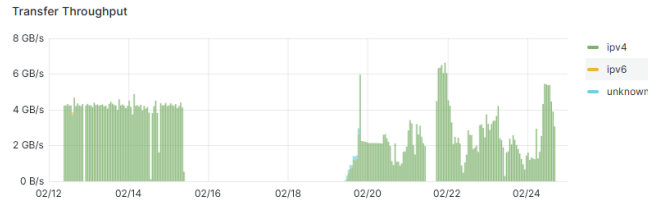- All transfers from CNAF via IPv6!



To CNAF
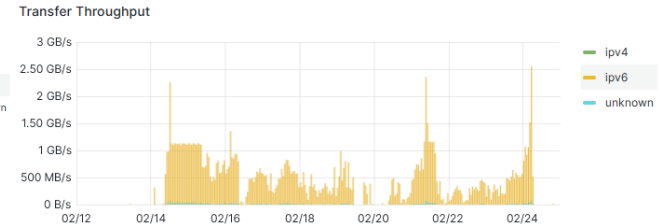


From CNAF

# T0 → JINR → T0

- Same story, only IPv4 to JINR, only IPv6 from JINR

- But 100% reliable



To JINR
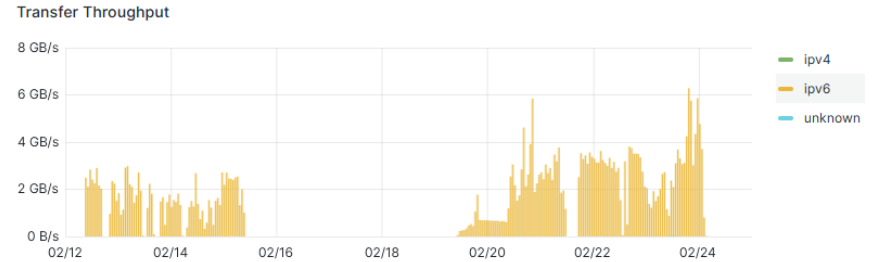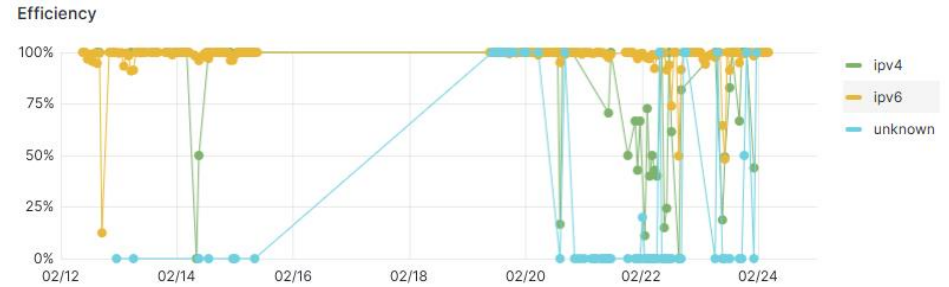
From JINR

# T0 → RAL

- Another IPv6-only site!

- Very few failures

# T0 → FNAL

- Disturbingly high fraction of IPv4 transfers

  - It looks like something "broke" at some point



Efficiency



Transfer Throughput
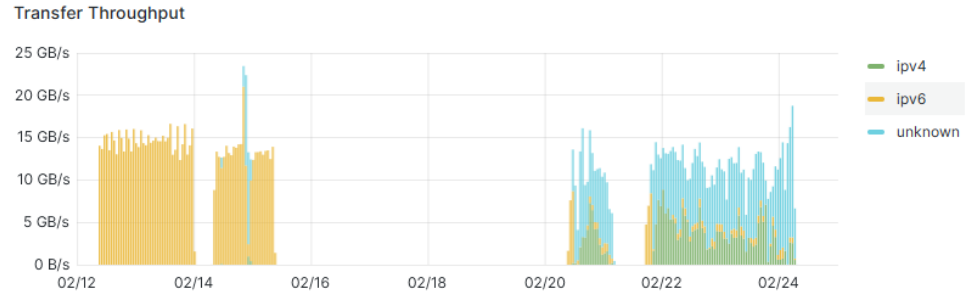
# All T1s → T0

- All inverse traffic goes via IPv6
  - Also for CNAF, JINR and FNAL!!

Efficiency

ipv4
ipv6
unknown

Transfer Throughput

ipv4
ipv6
unknown
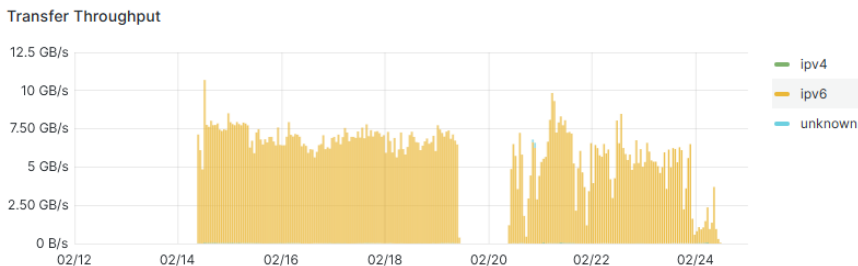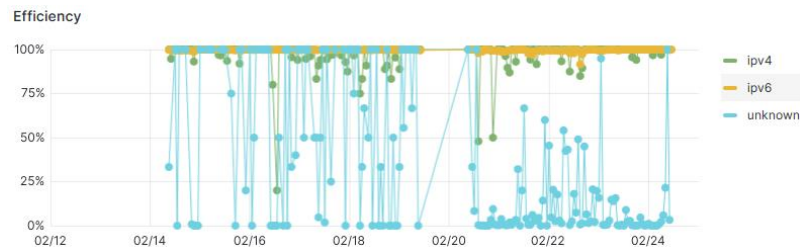
# T0/1 → T2

- ## Vast majority of transfers via IPv6
  - ### Positively surprising

- ## IPv6 more reliable?
  - ### Maybe the sites which use it are "better" for unrelated reasons?



Efficiency



Transfer Throughput
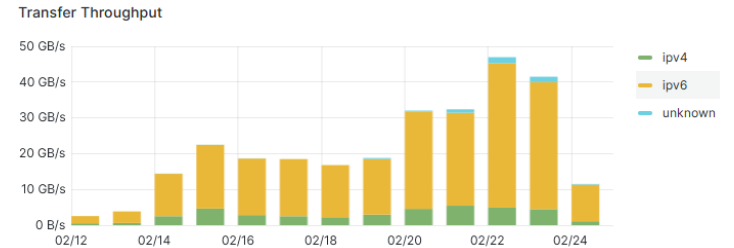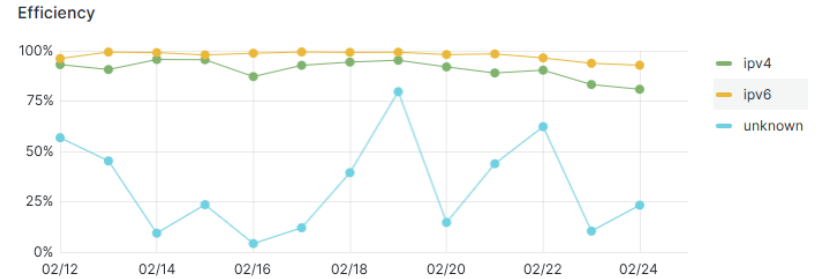
# Network plots for CERN - CNAF

# Is FTS monitoring reliable?

- Numbers for all VOs, all activity (DC is the vast majority anyway)
- It seems that it is NOT reliable
  - I'd be happy to be proved wrong!
- Could it be a bug in StoRM?

| | FTS monitoring | | Network monitoring | |
|---|---|---|---|---|
| | IPv4 | IPv6 | IPv4 | IPv6 |
| CERN → CNAF | 3.90 PB | 0 | 0.54 PB | 9.2 PB |
| CNAF → CERN | 0 | 0.97 | 0.59 PB | 4.9 PB |

# Conclusions

- FTS shows that most CMS sites only used IPv6 for transfers
- For two T1's, many transfers have ipver undefined
  - This can happen also for successful transfers that last < 5 s (no performance markers are generated) (source: Mihai)
  - Maybe at some point during the DC smaller files were being transferred?
- Something very fishy is visible for CERN-CNAF traffic
  - IP protocol depends on direction? Numbers inconsistent with network monitoring
  - Waiting for an independent confirmation (and if confirmed, an explanation)