



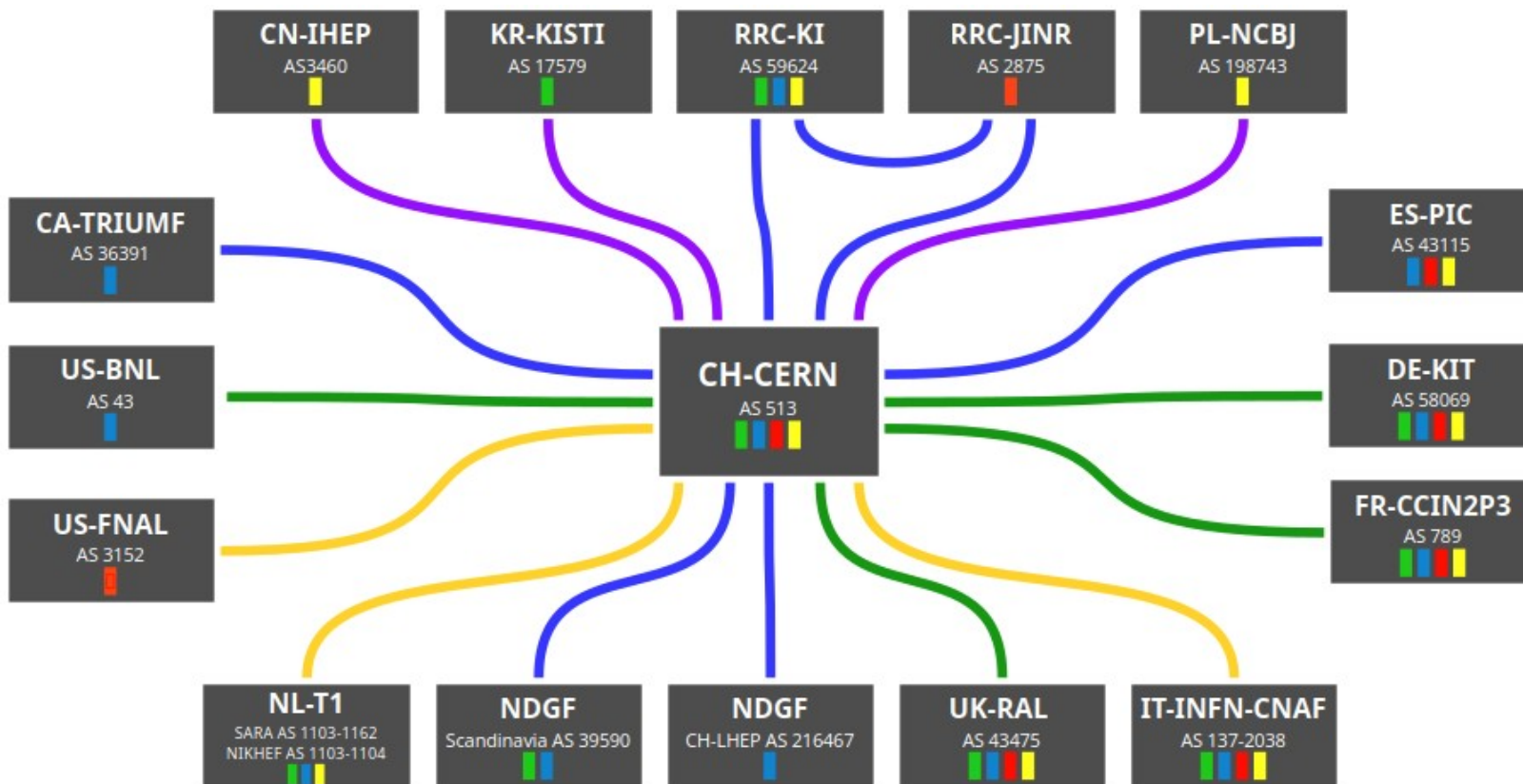
LHCOPN update

LHCOPN meeting #52, Catania IT

10th April 2024

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LHCOPN



<https://twiki.cern.ch/twiki/bin/view/LHCOPN/OverallNetworkMaps>

Numbers

- 17 sites for 15 Tier1s + 1 Tier0
- From 20Gbps to 400Gbps
- 14 countries in 3 continents
- 2.66 Tbps to the Tier0
- CN-IHEP and NDFG-LHEP last connected
- TW-ASGC has left

Line speeds:	Experiments:
— 20Gbps	■ = Alice ■ = Atlas
— 100Gbps	■ = CMS ■ = LHCb
— 200Gbps	Last update:
— 400Gbps	20240209
— 800Gbps	edoardo.martelli@cern.ch

Latest news

CH-CERN:

- The Preveessin Data Centre (PDC) is ready. Network and first batch of servers installed and in production



LHCOPN latest news

NLT1:

- SURF has tested a 800Gbps link on a single wavelength CERN-Amsterdam
- Tier1s will be connected with 2x 400Gbps

CH-LHEP (NDGF):

- Activated 100Gbps primary link. Provided by SWITCH

CN-IHEP

- Activated primary (via Marseille) and backup (via London) links, 20Gbps each.
Provided by GEANT and CERnet

FR-IN2P3

- Activated second 100Gbps link and configured in load-balancing with existing one.
Provided by RENATER. In time for DC24

LHCOPN latest news

IT-INFN-CNAF:

- 4x100Gbps over DCI connection activated and used during DC24
- DCI links have been kept in production. Legacy 2x 100Gbps will be kept as backup.

US-FNAL:

- Now with 400Gbps capacity for LHCOPN

New Serbian CMS Tier1:

- The Vinča Institute of Nuclear Sciences in Belgrade is working to become a CMS Tier1. They have a datacentre in Kragujevac, south of Belgrad. They have developed the project document and designated the project leader. Work in progress

LHCOPN latest news

UK-RAL:

- RAL will shortly be making an internal change that will allow RAL to fully utilize their LHCOPN link (they could currently only use 180Gb/s of the 200Gb/s capacity).
- The RAL Tier-1 batch farm is currently being made dual stack.
- In the coming year plan to move the tape service (Antares) onto both the LHCOPN and LHCONE to facilitate data export directly from CERN (not via the disk storage Echo).
- The LHCOPN link was down (undersea cable cut) for the first half of DC24. The failover to the LHCONE has been well tested and is working well!

TW-ASGC:

- Phase-out completed. All LHCOPN links and peerings removed

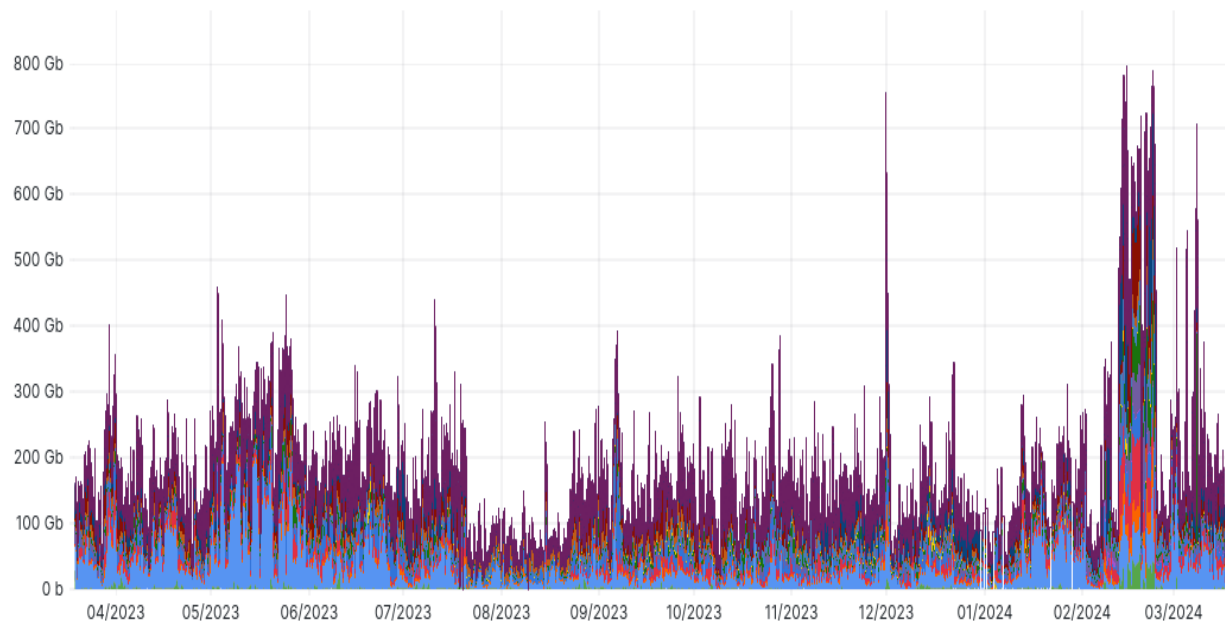
Latest news

Other Tier1s

- [input from the audience]

LHCOPN Traffic – last 12 months

LHCOPN Total Traffic (CERN → T1s)



Name	Mean	Max
Outgoing CA-TRIUMF	6.98 Gb	75.7 Gb
Outgoing CN-IHEP	15.2 Mb	21.6 Gb
Outgoing DE-KIT	51.5 Gb	203 Gb
Outgoing ES-PIC	5.96 Gb	96.6 Gb
Outgoing FR-IN2P3	14.3 Gb	169 Gb
Outgoing IT-INFN-CNAF	16.1 Gb	154 Gb
Outgoing KR-KISTI	290 Mb	18.6 Gb
Outgoing NDGF	8.19 Gb	110 Gb
Outgoing NL-T1	10.3 Gb	545 Gb
Outgoing-PL-NCBJ	690 Mb	18.9 Gb
Outgoing RU-T1	8.80 Gb	73.9 Gb
Outgoing UK-RAL	8.49 Gb	40.5 Gb
Outgoing US-BNL	14.6 Gb	148 Gb
Outgoing US-FNAL	11.2 Gb	204 Gb
Total	157 Gb	797 Gb

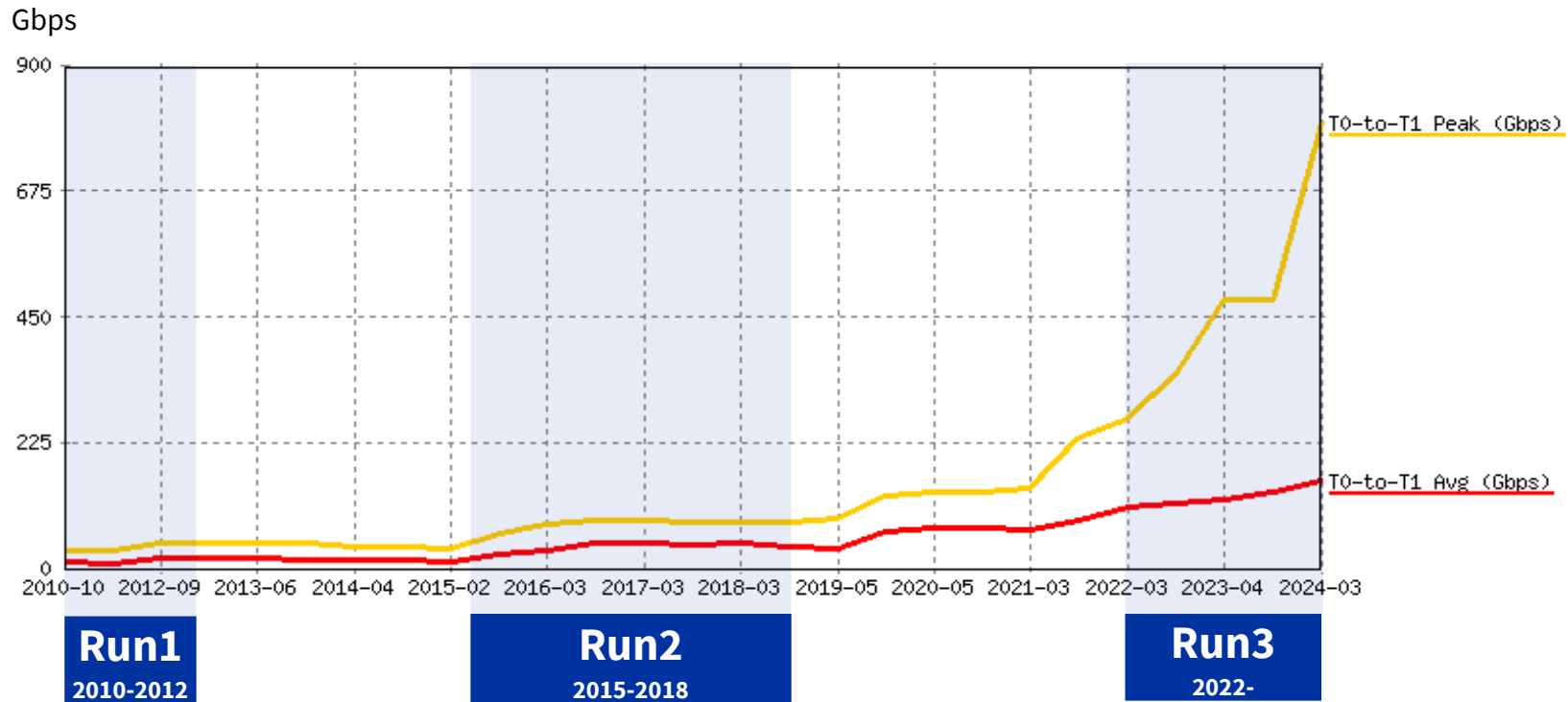
Numbers:

Moved ~619 PB in the last 12 months

+27% compared to previous year (488PB)

Peak at ~800Gbps (during DC24)

LHCOPN: traffic growth



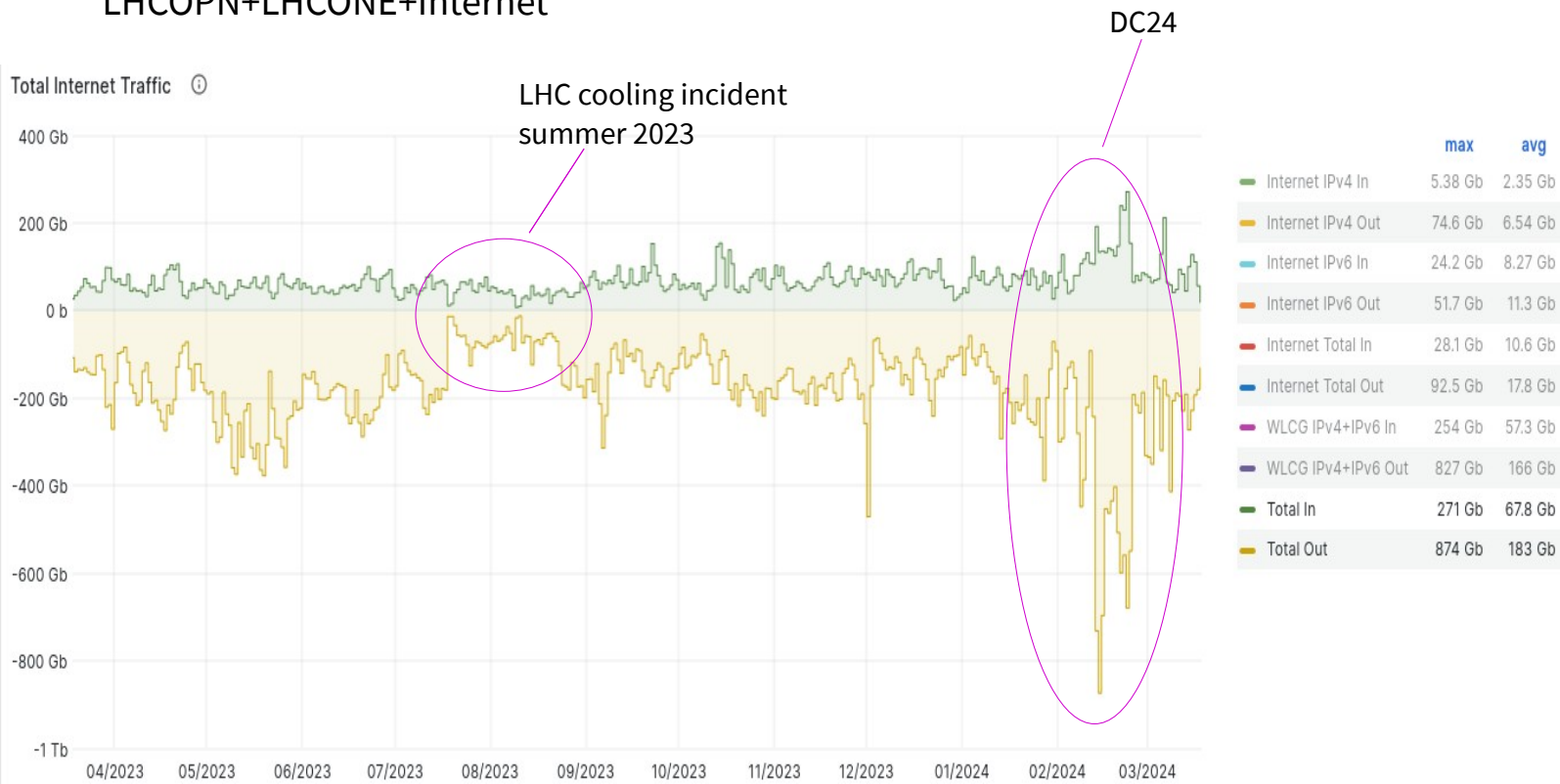
Run1: 2010-12
LS1: 2013-14
Run2: 2015-18
LS2: 2019-21
Run3: 2022-25

Y-Axis: Gbps - Average bandwidth of previous 12 months



CERN total traffic

LHCOPN+LHCONE+Internet



Numbers:

Sent out ~721 PB
in the last 12
months

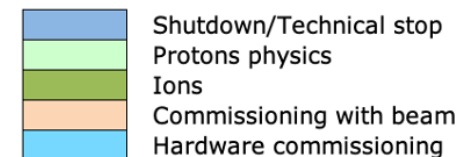
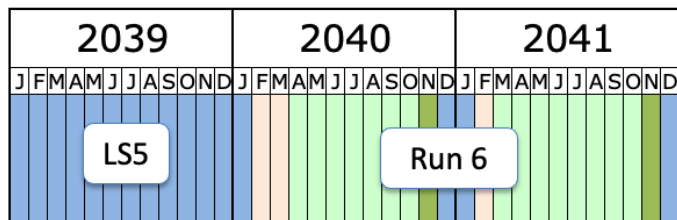
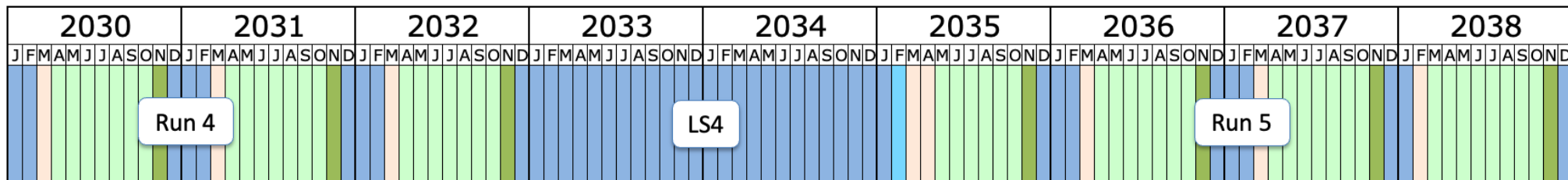
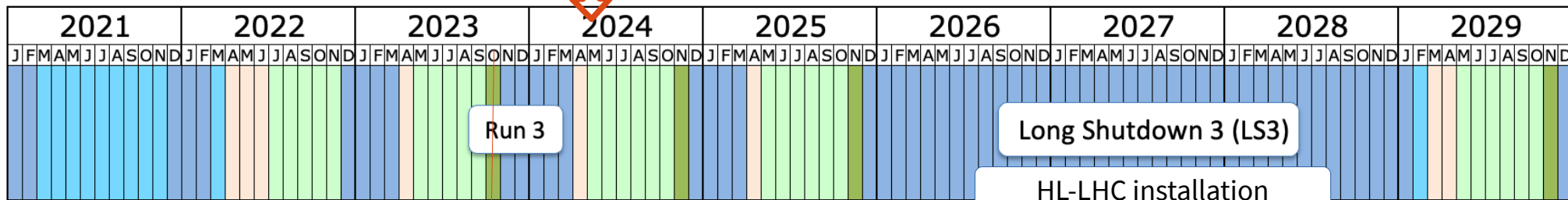
+27% compared
to previous year
(567PB)

Ref: https://monit-grafana.cern.ch/d/cScW82Tnz/00-overview?orgId=14&var-source=long_term&var-bin=1d&from=now-1y&to=now



LHC schedule

Here today



Last update: April 2023



Questions?

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