

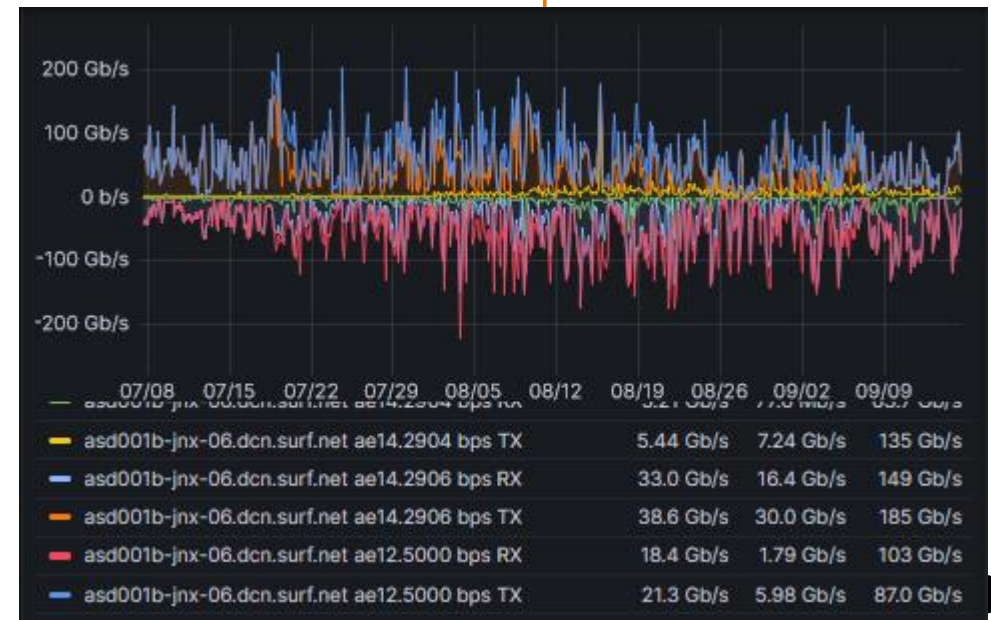
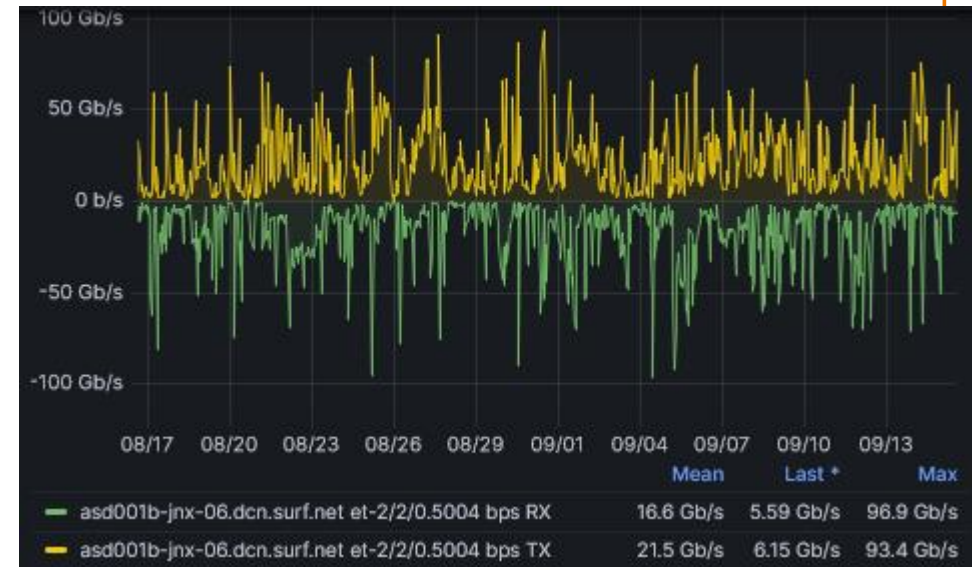
CHALLENGES WITH LHCOPN LINKS

Help we have congestion on a link!!!

SURF

So the LHCOPN was build with dedicated links

- But not everywhere
 - CERN - Triumpf services uses ANA link (primary Amsterdam-Moxy, backup Manlan-Paris)
 - Peak 90+Gbit, average 16.6/21.5Gbit
 - CERN - NL-T1 links share capacity with CERN – Triumpf services (both primary and backup Atlantic path and will not mention the Hamburg backup)
 - Peak 160/180Gbit, average 25Gbit
 - T0 – T1 links are used very spiky, with average way lower. Usually, $\frac{1}{4}$ or even way less
- With the transition to 400G it is for SURF not realistic to do separate 400G links → sharing one for now is fine → we do have an upgrade plan



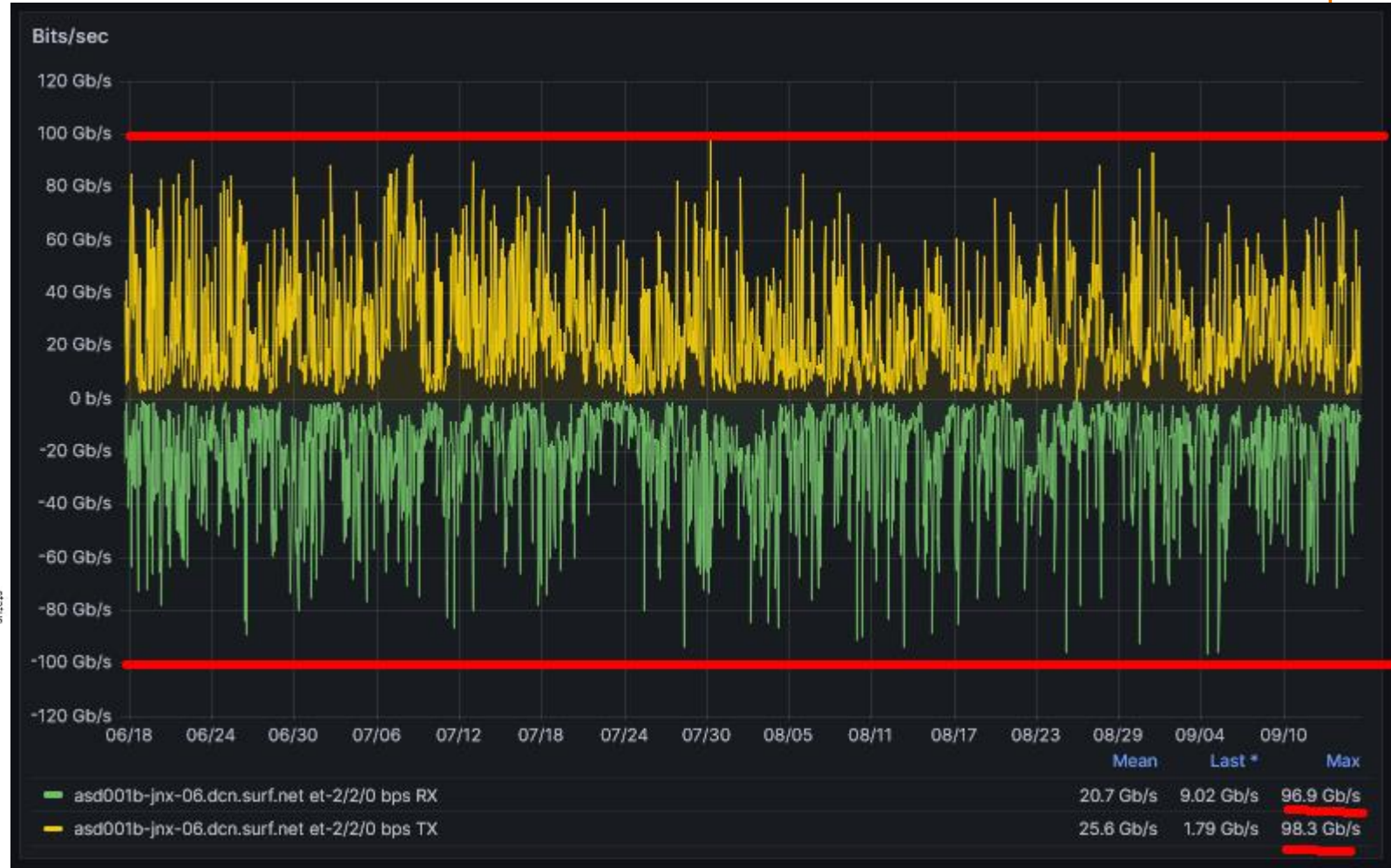
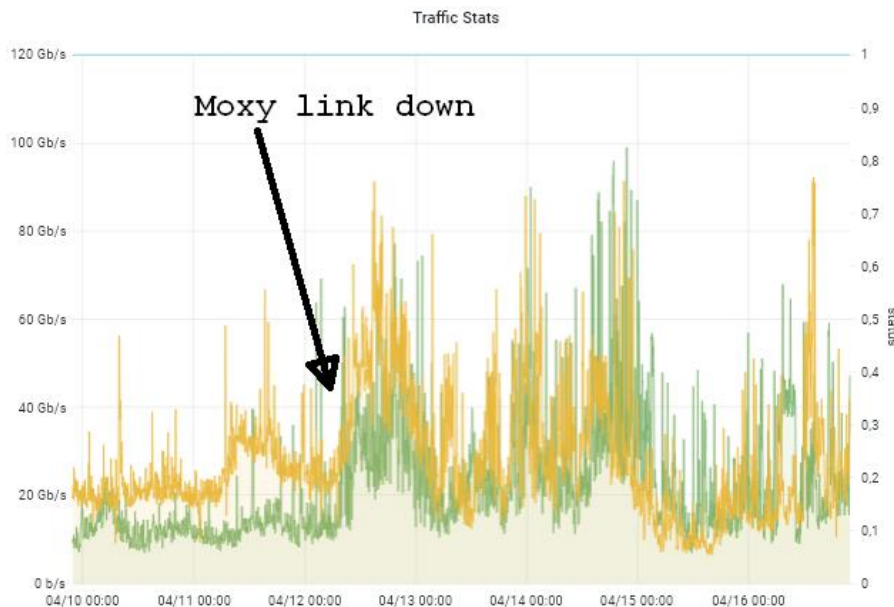
If we would honor the capacity agreement with Canarie

- Service would be disastrous
 - We agreed 20G Amsterdam-Geneva and 20G Paris-Geneva
 - Even if we add all that to a 40G service, anything above/below the line would be gone
 - How to limit???
 - Just rate-limit → everything above 40G spikes gone
 - Or packet pace in the network → introduce a lot of buffer bloat (host based is fine)
- But the good news we do not enforce!!!



CERN – Triumpf services causes a lot of grief on ANA

- Moxy link (primary path of CERN – Triumpf T0 – T1 service)
- And it has done damage on the backup as well
- Moving to different ANA link pointless, it are all 100G link for now



The challenge

- Giving a host a 100G NIC and a TCP window → will give you spikes
- There are better congestion avoidance implementation, to recover from congestion
- But why can we not avoid by better averaging out → or playing nicer
- I strongly support the [WLCG Traffic Pacing proposal](#) from Eli/Shawn
- As NREN we can't do anything except for throwing more capacity
- This needs to be tackled on the end-hosts (sender side)
- **How do we get ourself as network operators for LHCOPN in contact with administrators of end hosts?**

A close-up photograph of a hand holding a glowing incandescent lightbulb. The lightbulb is the central focus, emitting a warm, yellowish glow. The hand is positioned around the bulb, with fingers visible. The background is dark, making the lightbulb stand out. A semi-transparent white box is overlaid on the left side of the image, containing the text 'Any idea's???'.

Any idea's???

With the arrival of 400G ANA links problem will disappear for some time

- Amite (400G Boston-Bordeaux-Paris) will be live in Q3/Q4
- Planned as new primary for CERN – Triumf
- It will share the link with GEANT-Internet2 R&E peering
- It will keep using the Paris-Geneva section from SURF (and as such share the link with CERN – NL-T1)
- Backup for CERN – Triumf will remain via Amsterdam – Moxy ANA link → plans to upgrade that to 400G as well
- **Just wait until hosts get 400G nics and where back in trouble → this issue will return!!!**

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