JUNO update

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INFN – CT

Experimental site and detector

Campus, August 1° 2022

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Acrylic support, June 30° 2022

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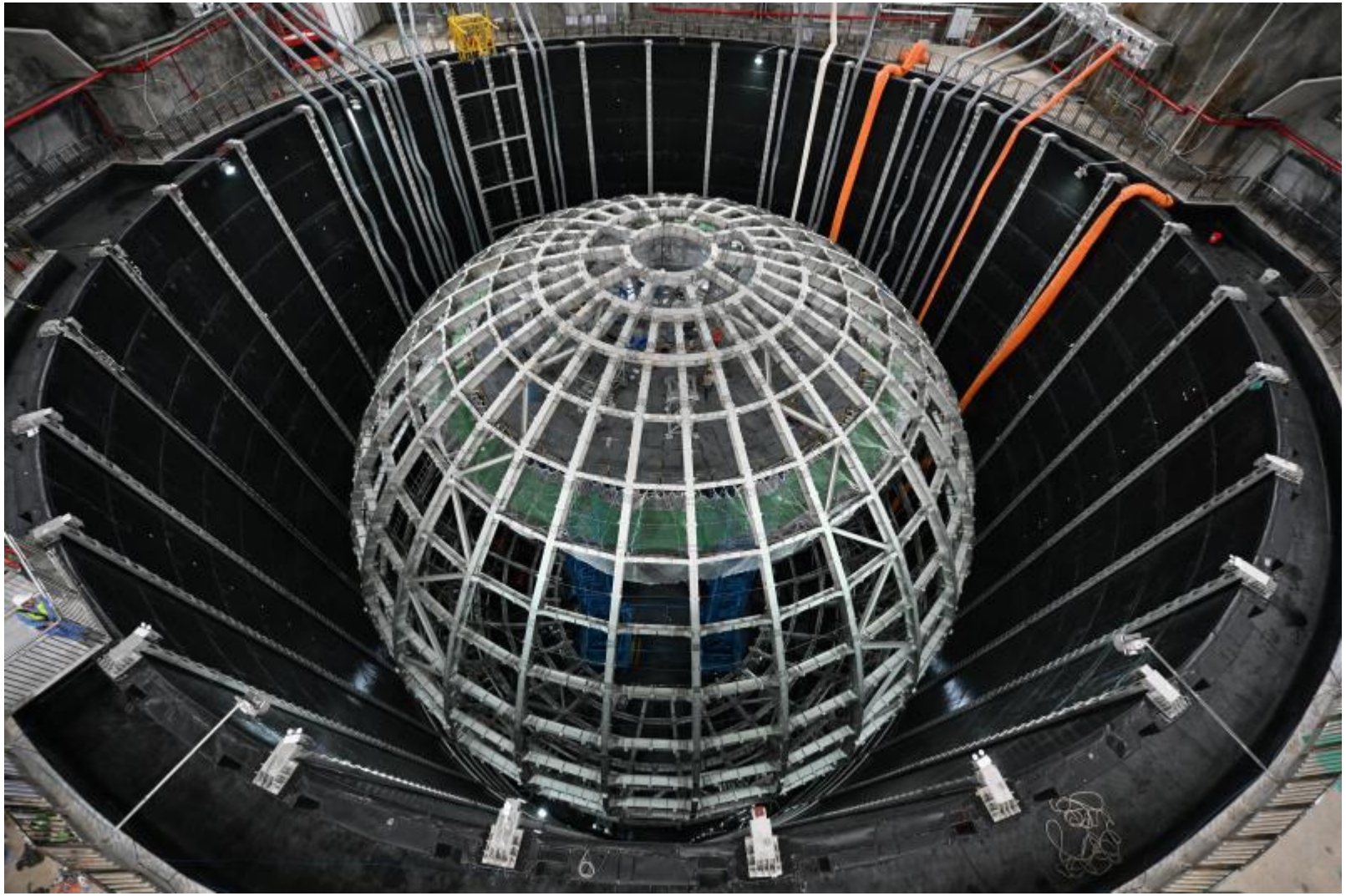
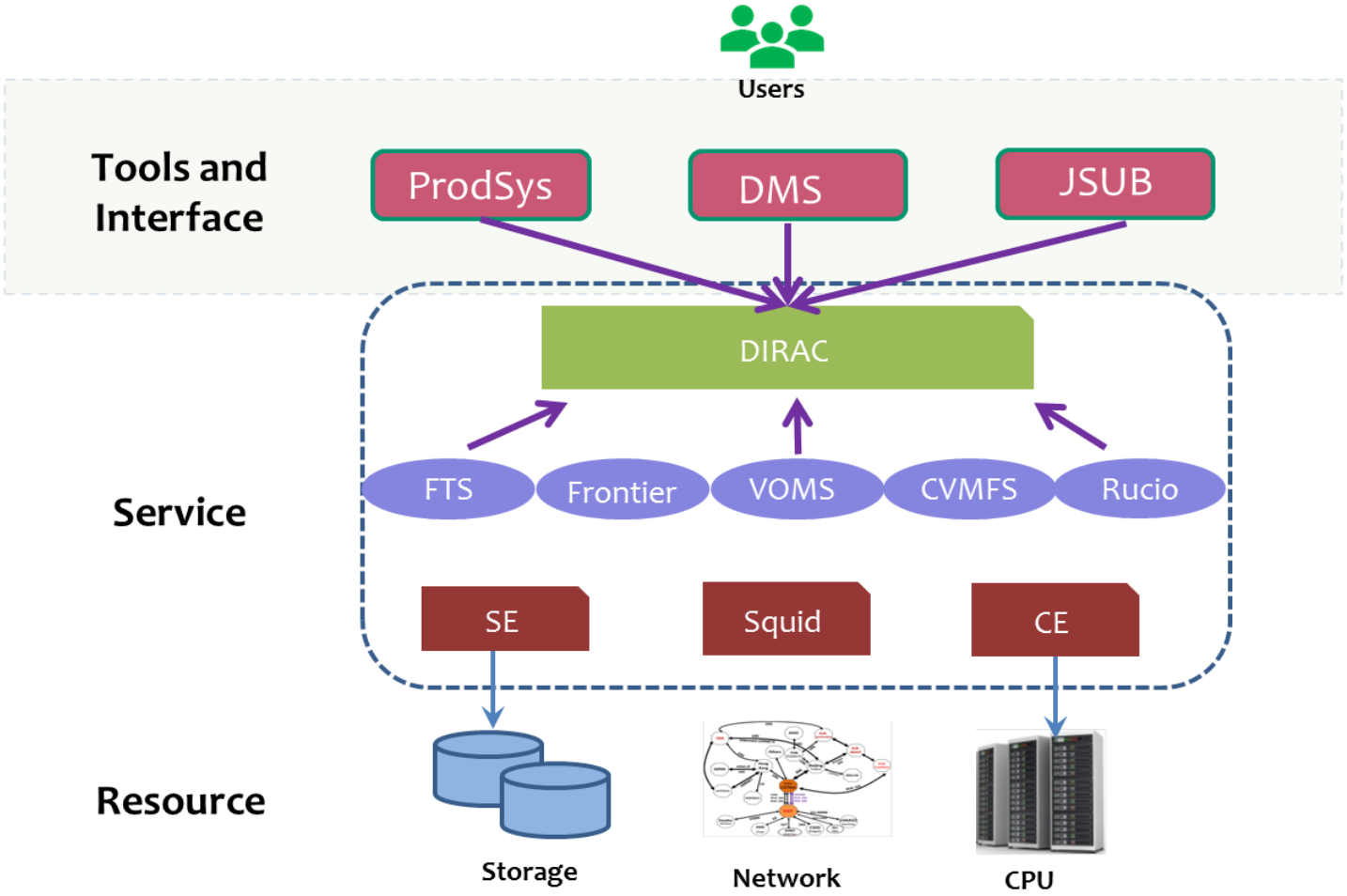


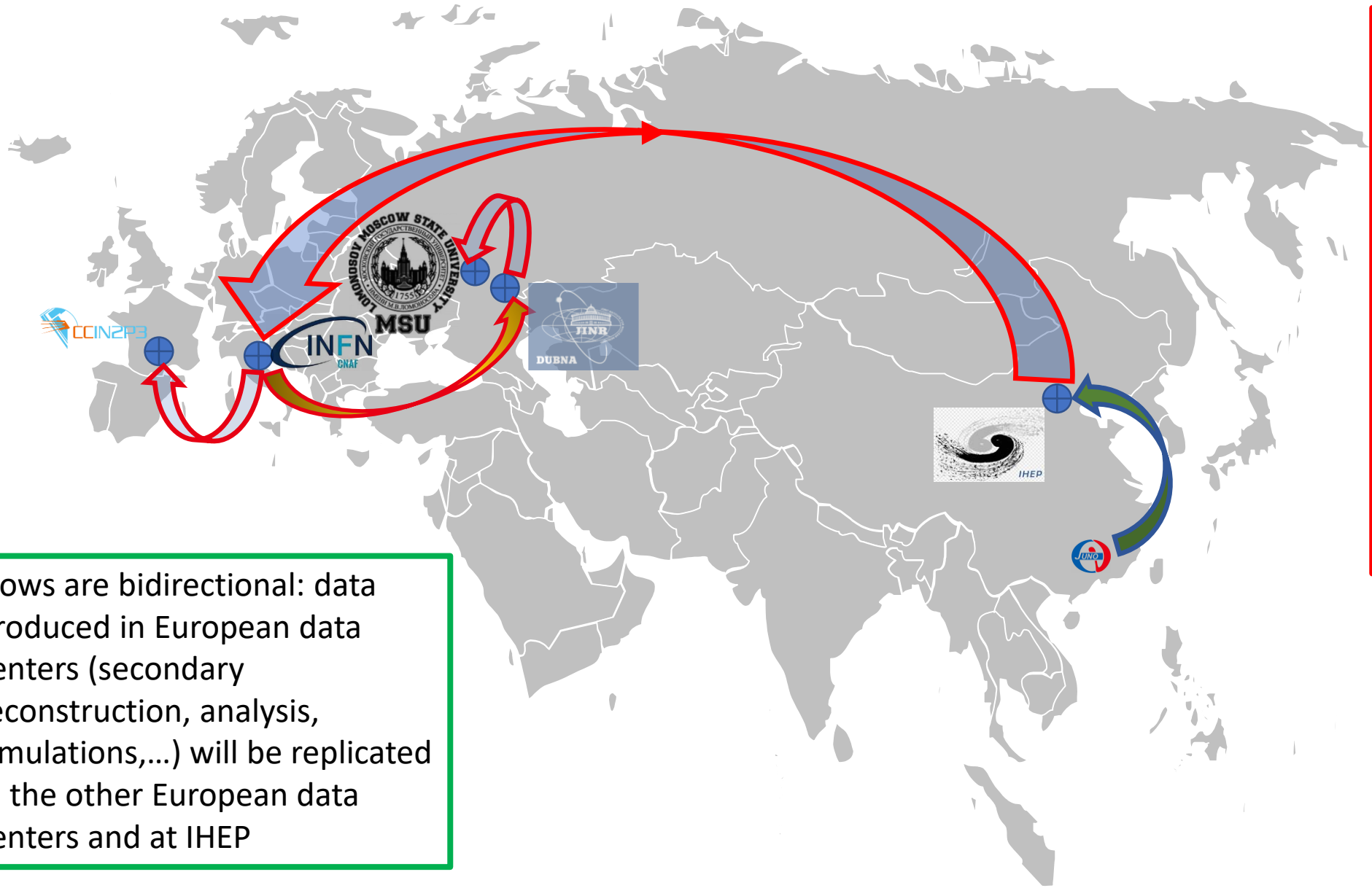
DCI and network

DCI infrastructure



Data flows

IHEP will receive data from experimental site and store them in master repository. At IHEP will run fast calibration and prompt reconstruction



1. IHEP main repository will be automatically replicated at CNAF
2. From CNAF data will be copied also to JINR
3. CC-IN2P3 will maintain a copy of part of the data at CNAF with the chance to access data physically at CNAF
4. JINR data will be accessed from MSU resources

Flows are bidirectional: data produced in European data centers (secondary reconstruction, analysis, simulations,…) will be replicated in the other European data centers and at IHEP

Network challenge

Goals and procedure

- First challenge was aimed to:
  - Create the team, made mainly from data centers sysadmins
  - Put in evidence the first macroscopic issues and fix first problems
- Procedure
  - Installed iperf3 on the storage front end servers in every centre
  - Checked network settings to ensure better results
    - Some time spent to align, for example, MTU setting
  - Issued a command performing the transfer of 40 files, 5 GB each, using gfal-copy and performing, in parallel, the command
    - iperf3 -d -c <<servername>> -p 5201 -P 10
  - Reported the bandwidth results

Collected results

- Measurements made in different times, when teams in different data centers matched
- Sometimes, when results where too much poor, some fine tuning work on network was needed
- In green, couple of data centers important in the data flow proposal
  - JUNO requires a minimum average badwidth of about 1.00 Gbps

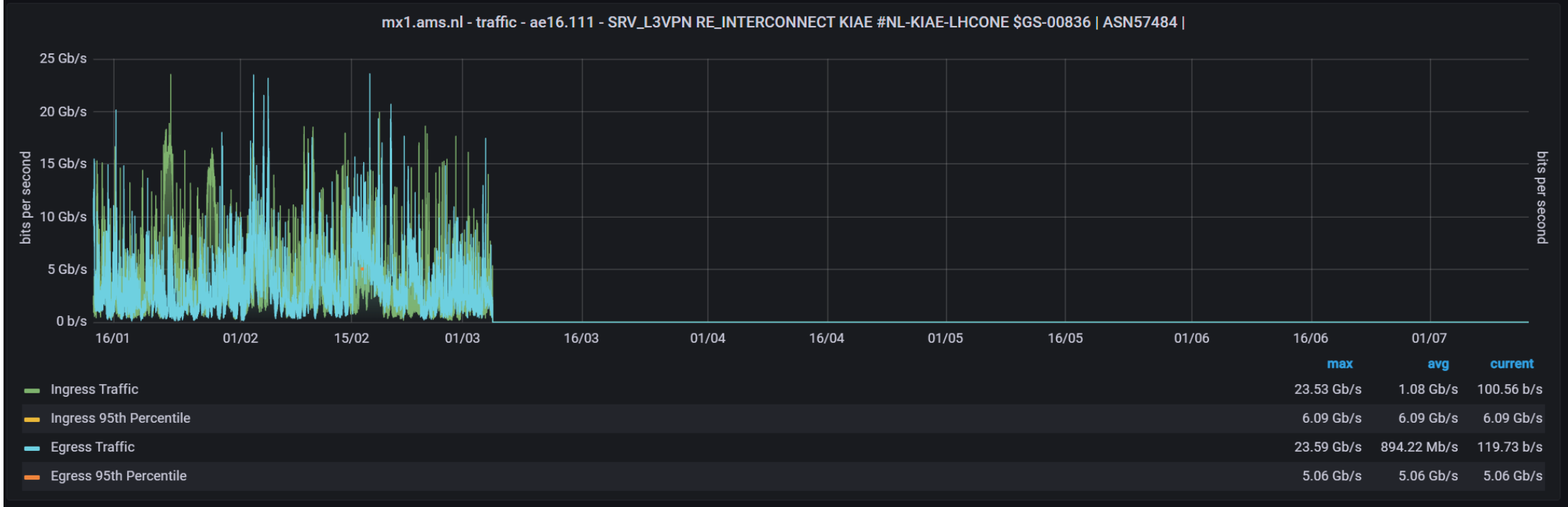
Source	Destination	Date	Result
CNAF	IHEP	22/03/2022	3.00
IHEP	CNAF	22/03/2022	1.60
CC-IN2P3	CNAF	19/04/2022	7.00
CC-IN2P3	IHEP	19/04/2022	1.69
CC-IN2P3	JINR	19/04/2022	2.13
CNAF	CC-IN2P3	19/04/2022	10.00
IHEP	CC-IN2P3	19/04/2022	1.65
IHEP	JINR	02/06/2022	1.00
JINR	IHEP	02/06/2022	0.75
CNAF	JINR	06/06/2022	10.00
JINR	CNAF	06/06/2022	4.00
JINR	CC-IN2P3	11/07/2022	4.00
CNAF	MSU	15/07/2022	0.50
MSU	CNAF	15/07/2022	0.90

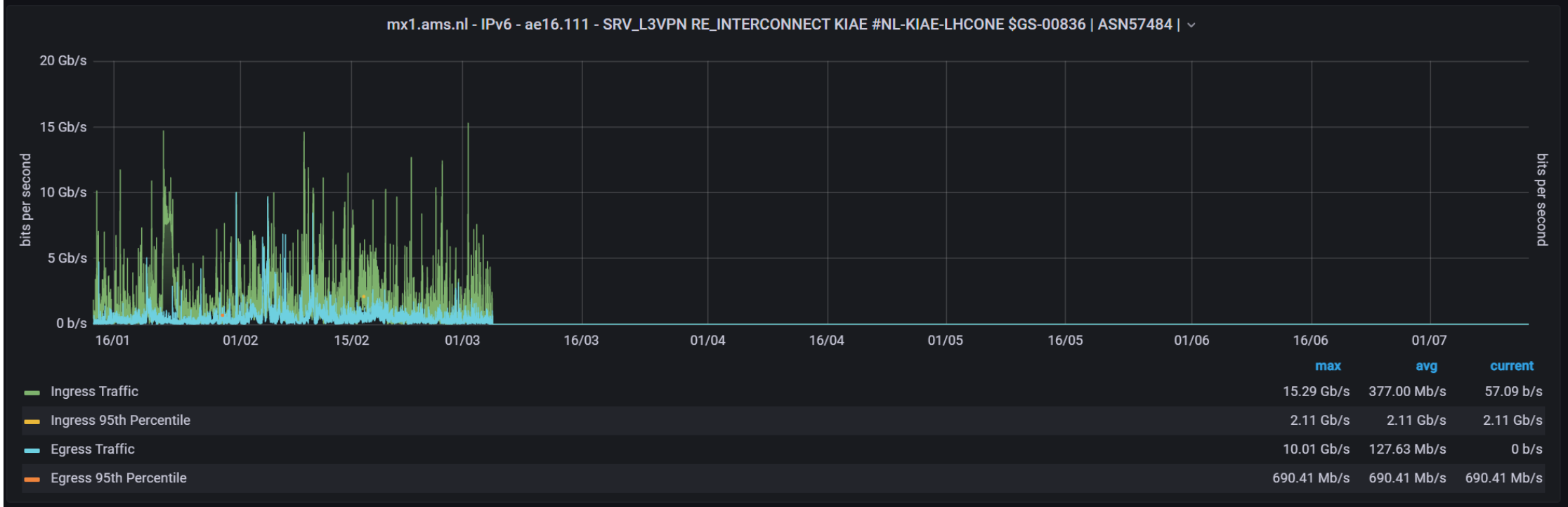
Status with Russia

Link
EU Kiae
6 months

LHCONE

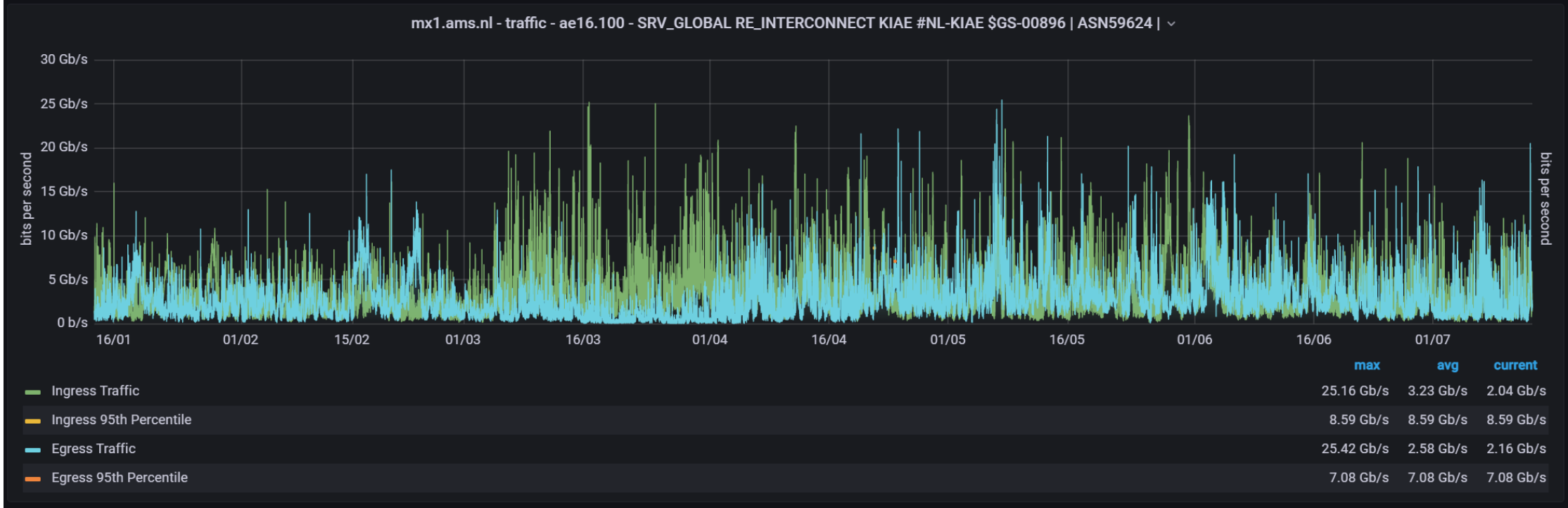
Kiae is an institution ensuring connection between EU and Russian NREN

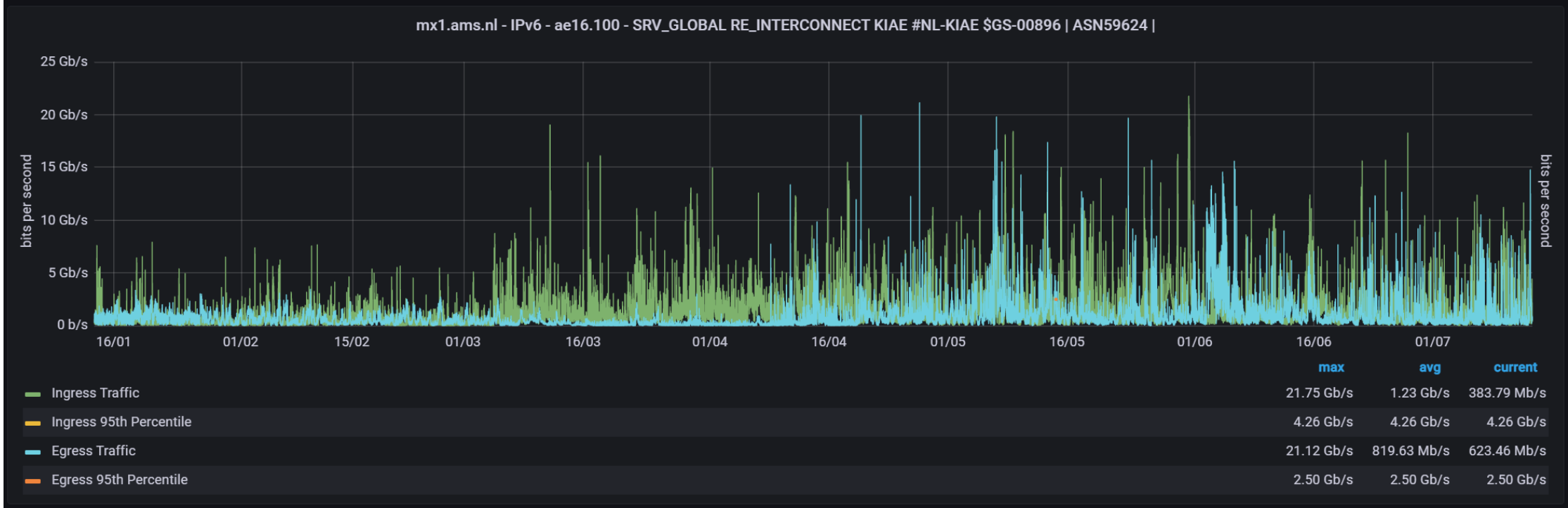




Link EU Kiae 6 months

No LHCONE





Connection to Russia

- LHCONE link to Russia turned off in March, but the general internet connection still working
- Despite of this, from our network challenge link between IHEP and JINR at the beginning of June is yet of the order og 1 Gbps
- Late this summer, also this link between IHEP and JINR dropped; recent tests provided values of the order of 1 Mbps
- We need to pay attention to future evolutions

Future perspective and conclusions

Next challenge

- We are organizing the second network challenge
- Goals are:
  - Confirm results from the first one
  - Look for new problems arised in the meanwhile
  - Hints for better network fine tuning between data centers
  - Discuss results with NREN to figure out future checks
- We need to be ready for the data taking, foreseen in the late 2023

Some rumors

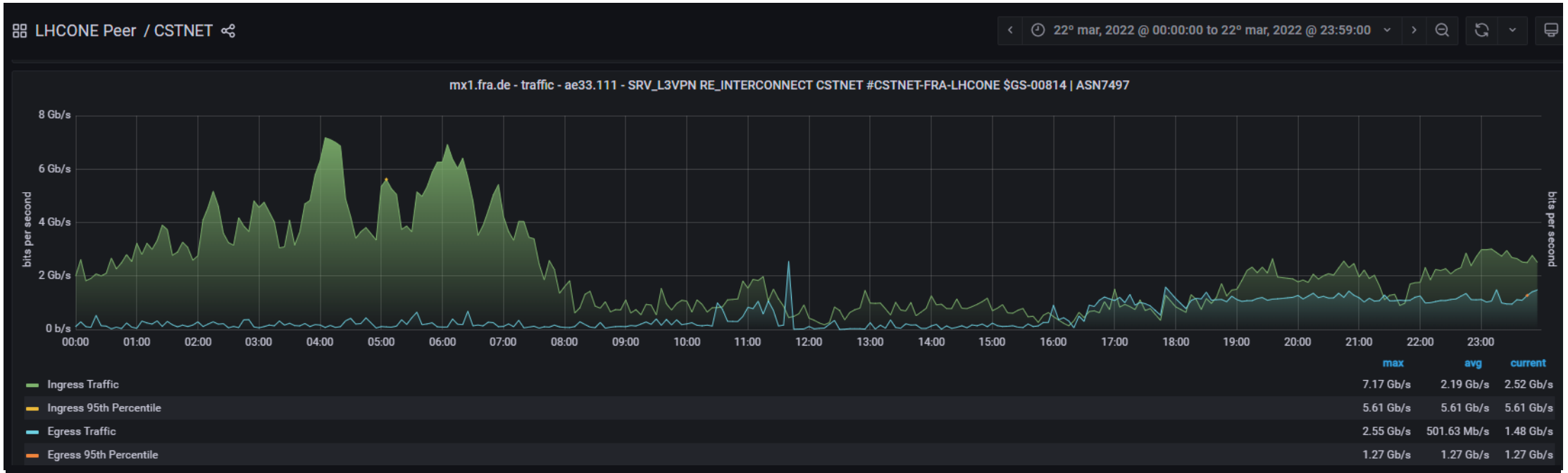
I was reported that:

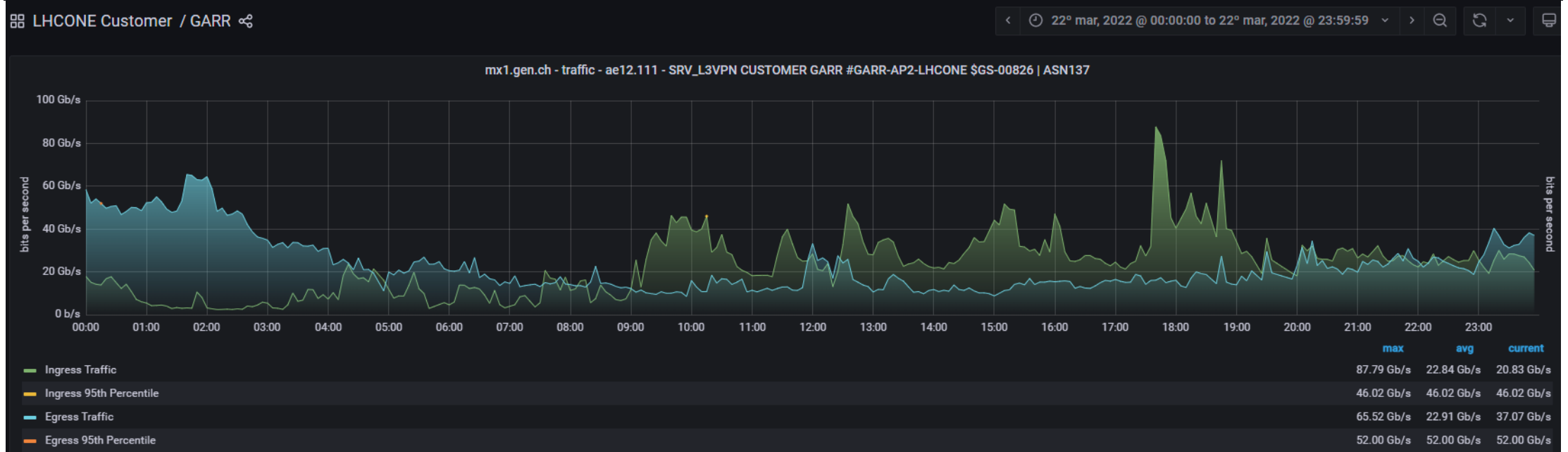
- Chinese Academy of Science and GEANT are working to upgrade link from 10Gbps to 100Gbps; yet no news about timing
- Russia and China are starting to discuss a direct network connection
  - This are absolutely preliminary
  - No idea about timings

Thank you

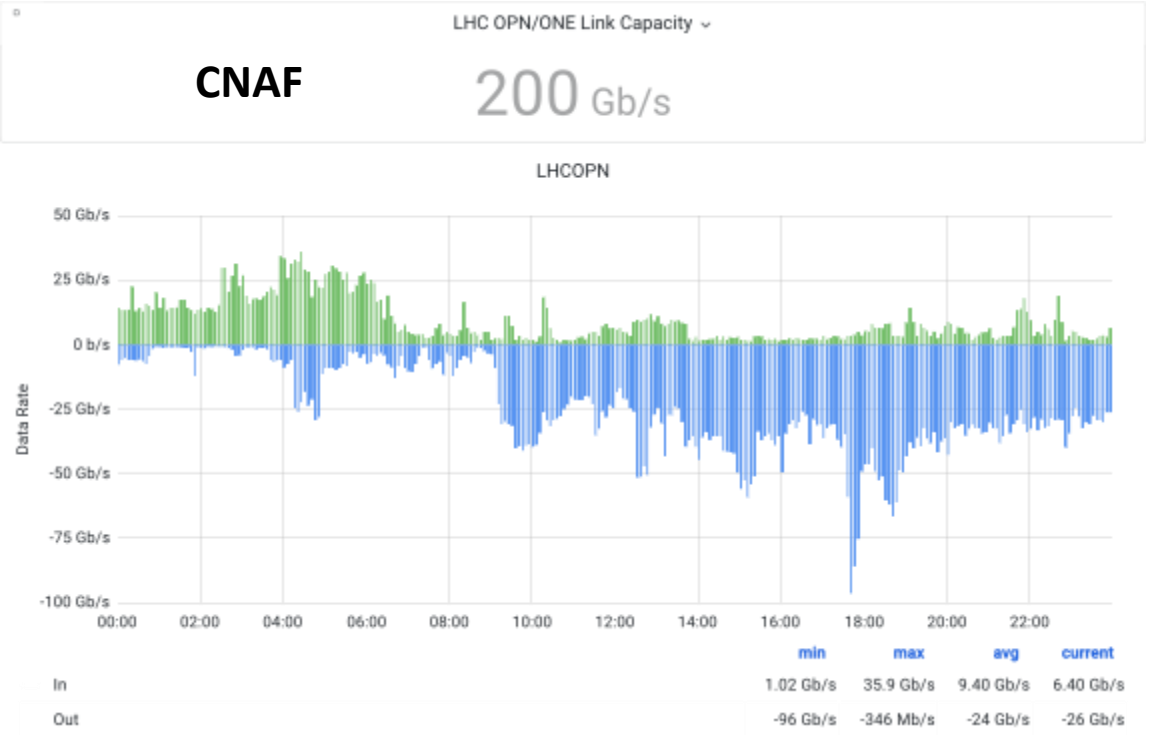
Backup

CNAF – IHEP on March 22° : GEANT





CNAF – IHEP on March 22°



CNAF – CC-IN2P3 on April 19°