ALICE Online/Offline (O2) and CTA usecase

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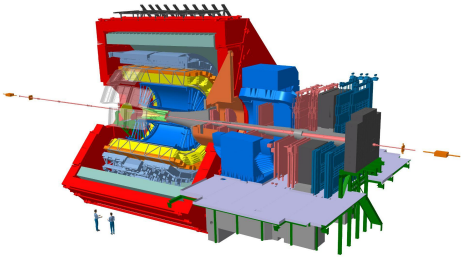
on behalf of the IT-SD group



RAW data 3.5TB/s

CPU+GPU farm

1. Writes RAW and compressed data
170GB/s

7. Reads data and produces AOD outside of HI run
20GB/s

EOSALICEO2 (180 PB)

4, 10. Writes data for T0 activities and Grid productions
20GB/s

Tier0 Site Async. Processing, Analysis

5. Reads/process/writes data

EOSALICE (115 PB)

6. Writes processed data to tape

2, 8. Transfers to tape
10GB/s

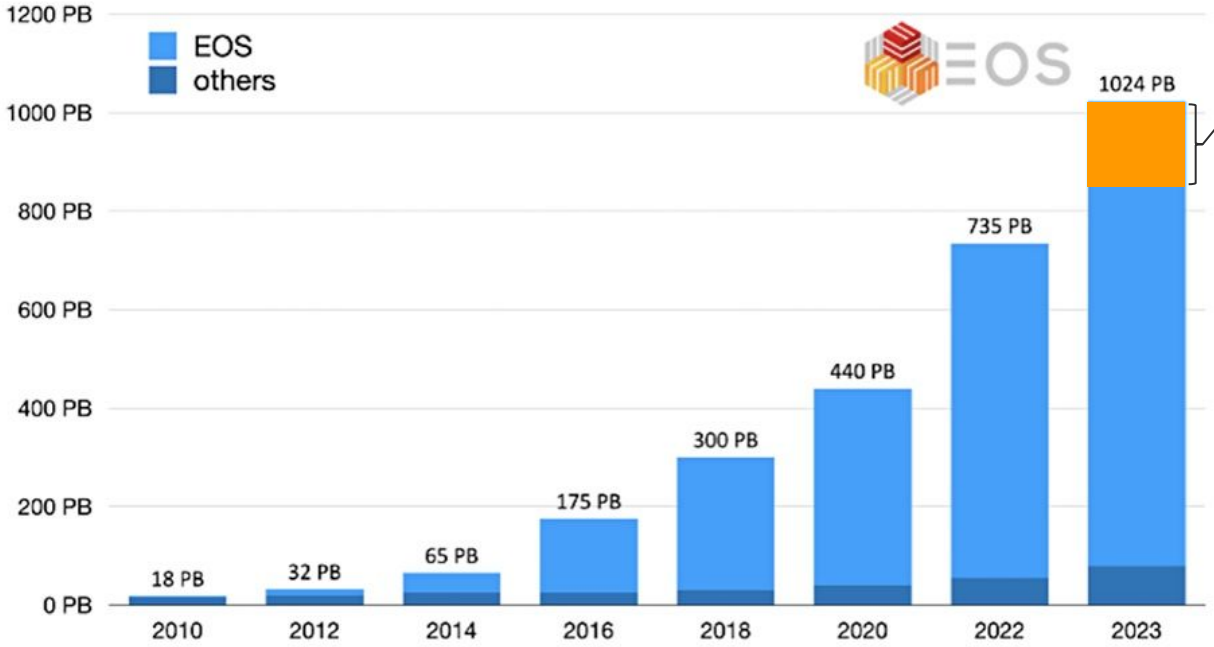
EOSCTAALICE (5 PB)

3, 9. Exports to T1
10GB/s

Tier1 Sites

AOD - Analysis Object Data
HI run - Heavy Ion run (PbPb collisions)

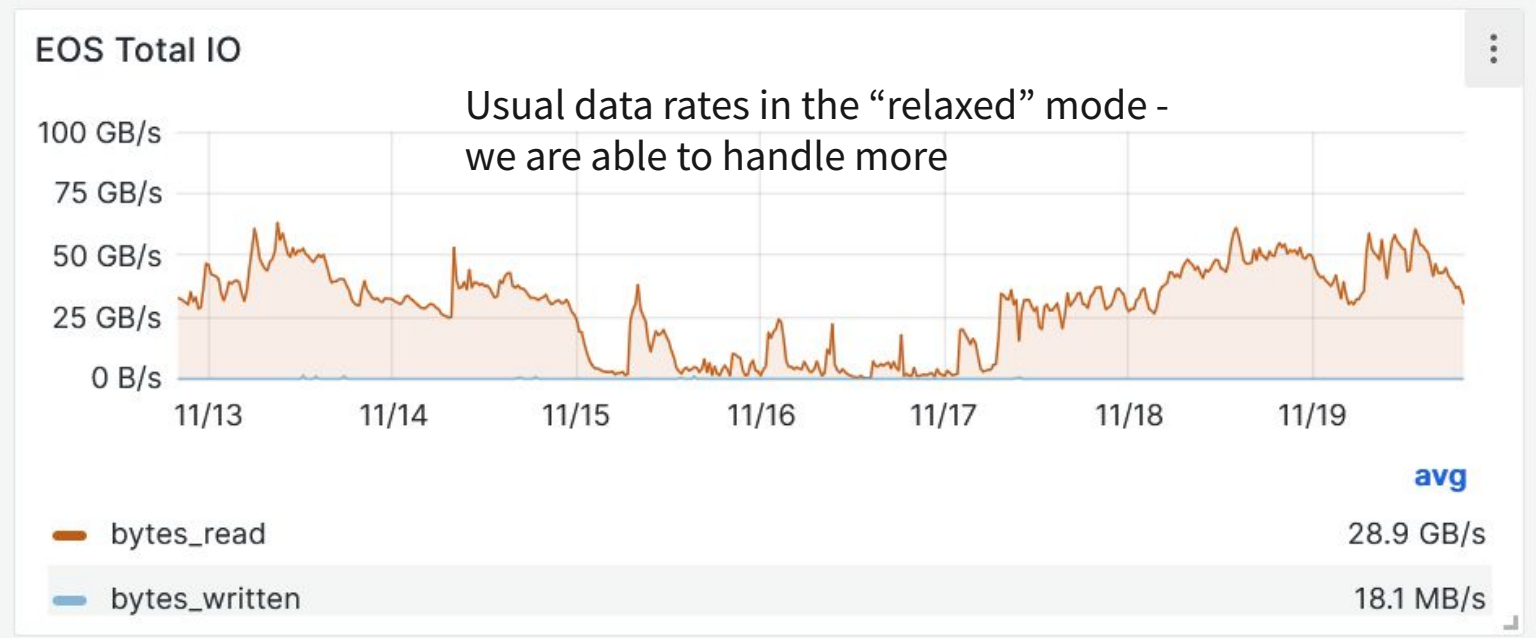
EOSALICEO2 - the biggest EOS instance at CERN



EOSALICEO2:

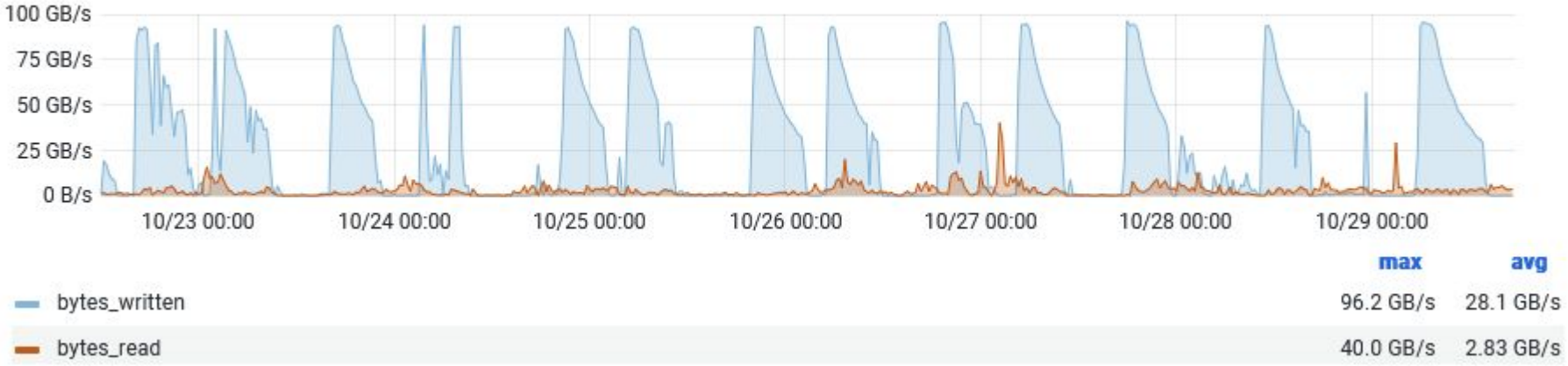
- 180 PB (raw)
- 32.7 Mil files
- > 12K disks (126 nodes)
- erasure coding layout
  - Reed-Solomon (12, 10)
  - scaling single stream performance with the number of data disks
  - redundancy and storage volume overhead

EOSALICEO2 data rates (last 7 days)

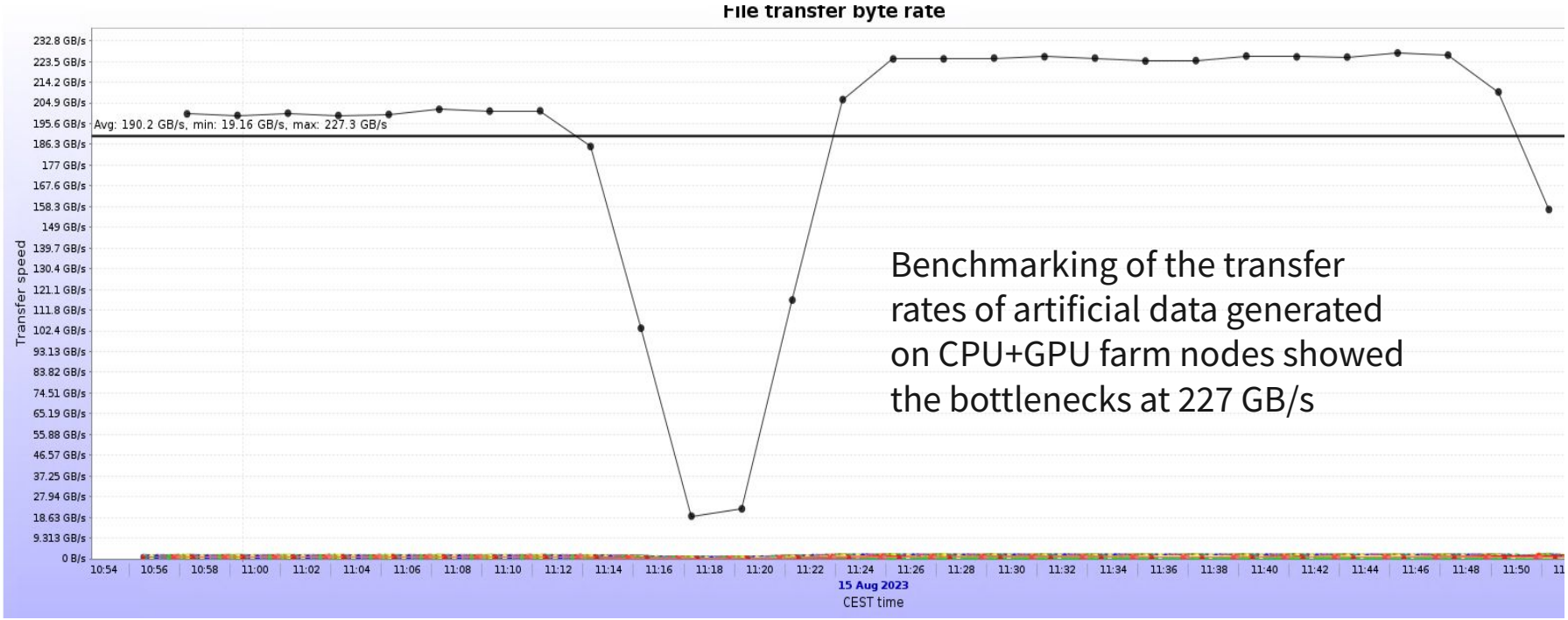


EOSALICEO2 data rates (Heavy Ion run)

Still “comfortable” rates during the data taking

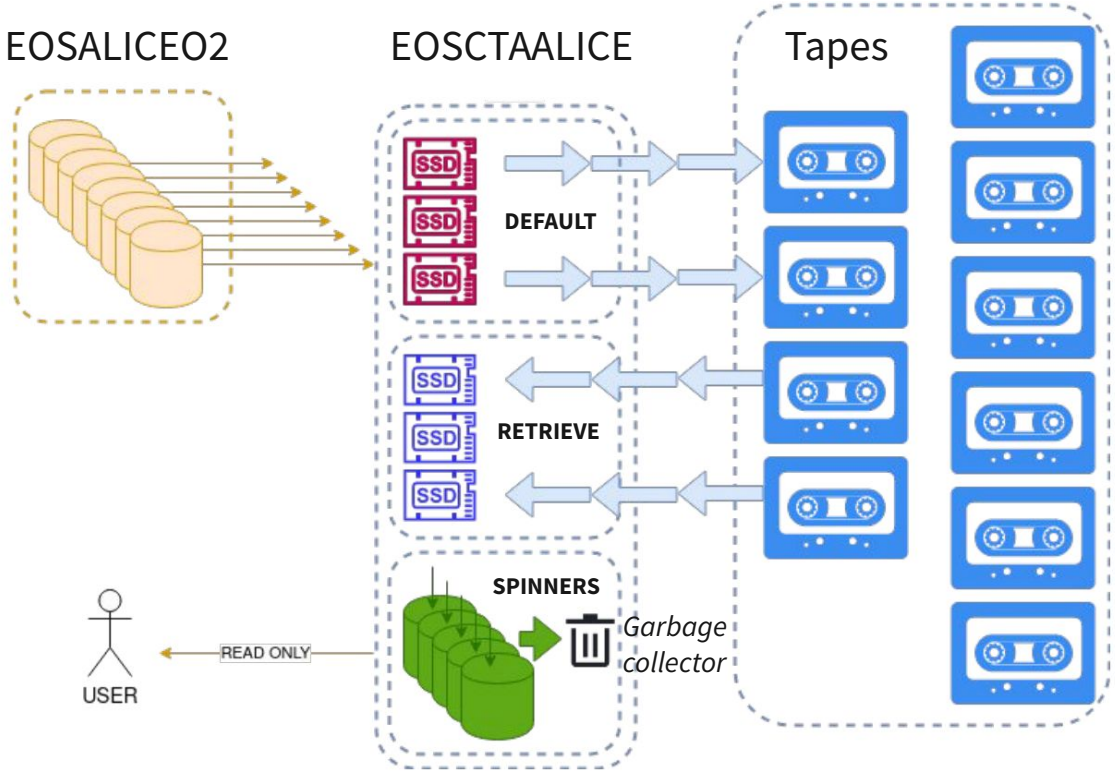


EOSALICEO2 data rate tests (15 Aug 2023)



Benchmarking of the transfer rates of artificial data generated on CPU+GPU farm nodes showed the bottlenecks at 227 GB/s

EOSCTAALICE layout



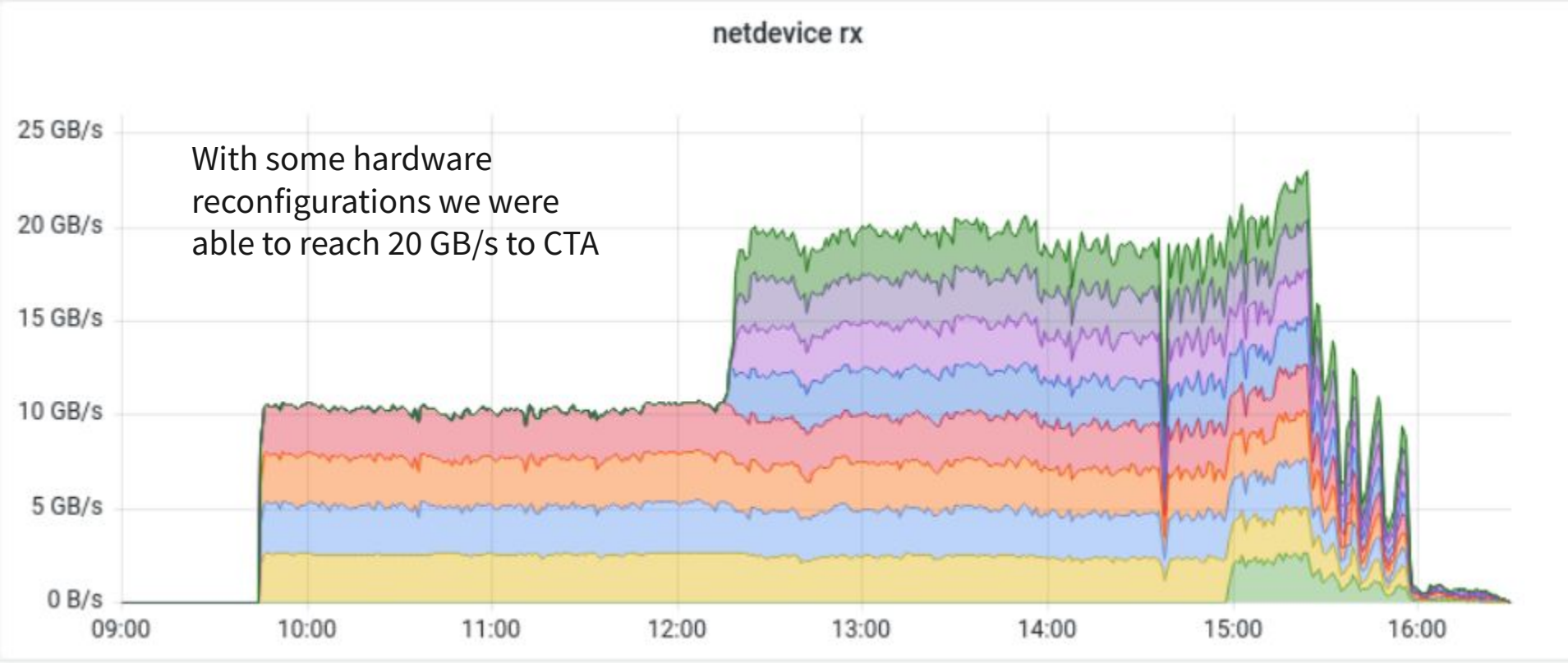
- default (archive): 122 SSDs, 234 TB
- retrieve: 30 SSDs, 57.6 TB
- spinners (staging): 444 disks, 5.85 PB
- > 110 PB on tape

●Retrieve space replicas are converted to spinners space

●Disk copies that have not been recently used should be auto “magically” garbage collected to make room for newly retrieved files

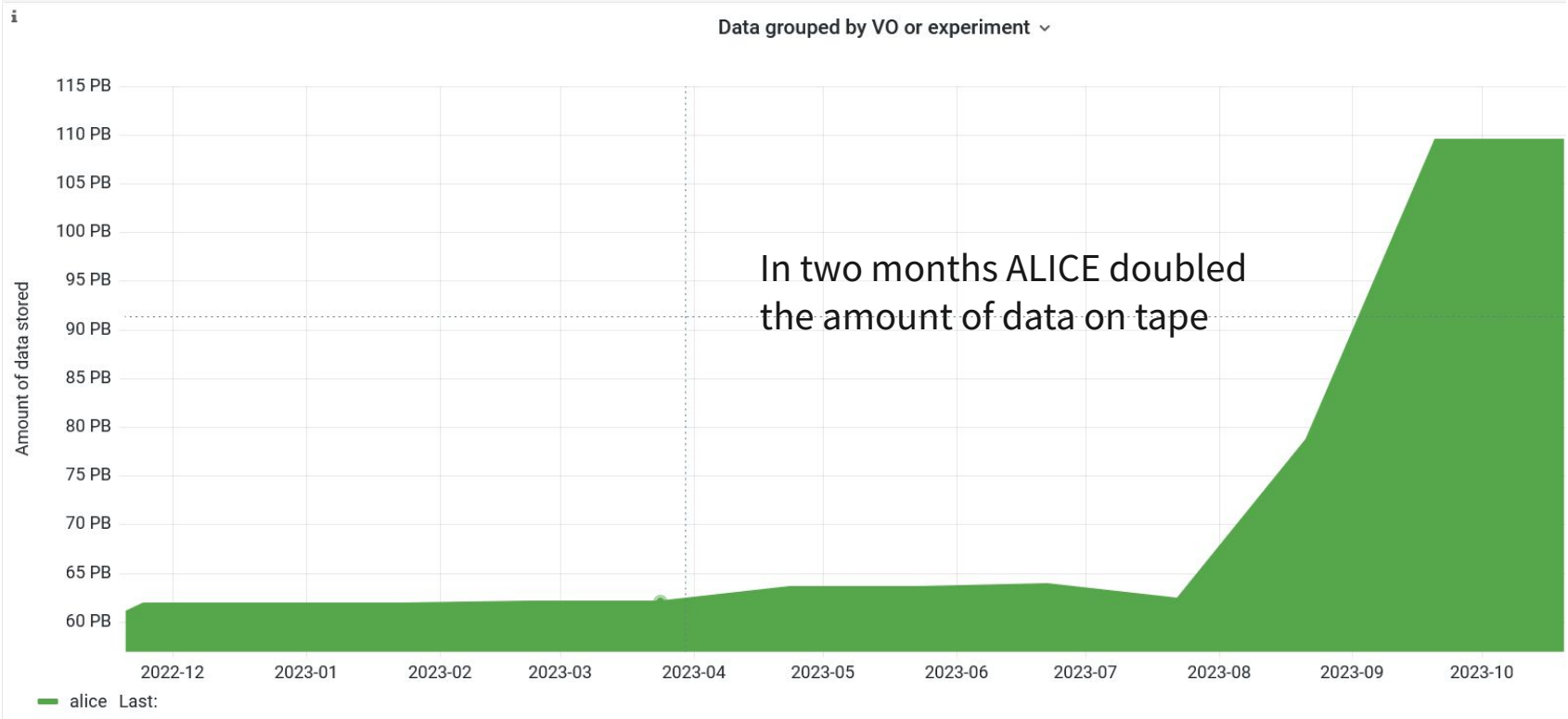
●Disk and tape files live in the same namespace

EOSCTAALICE data rate tests (21 June 2023)

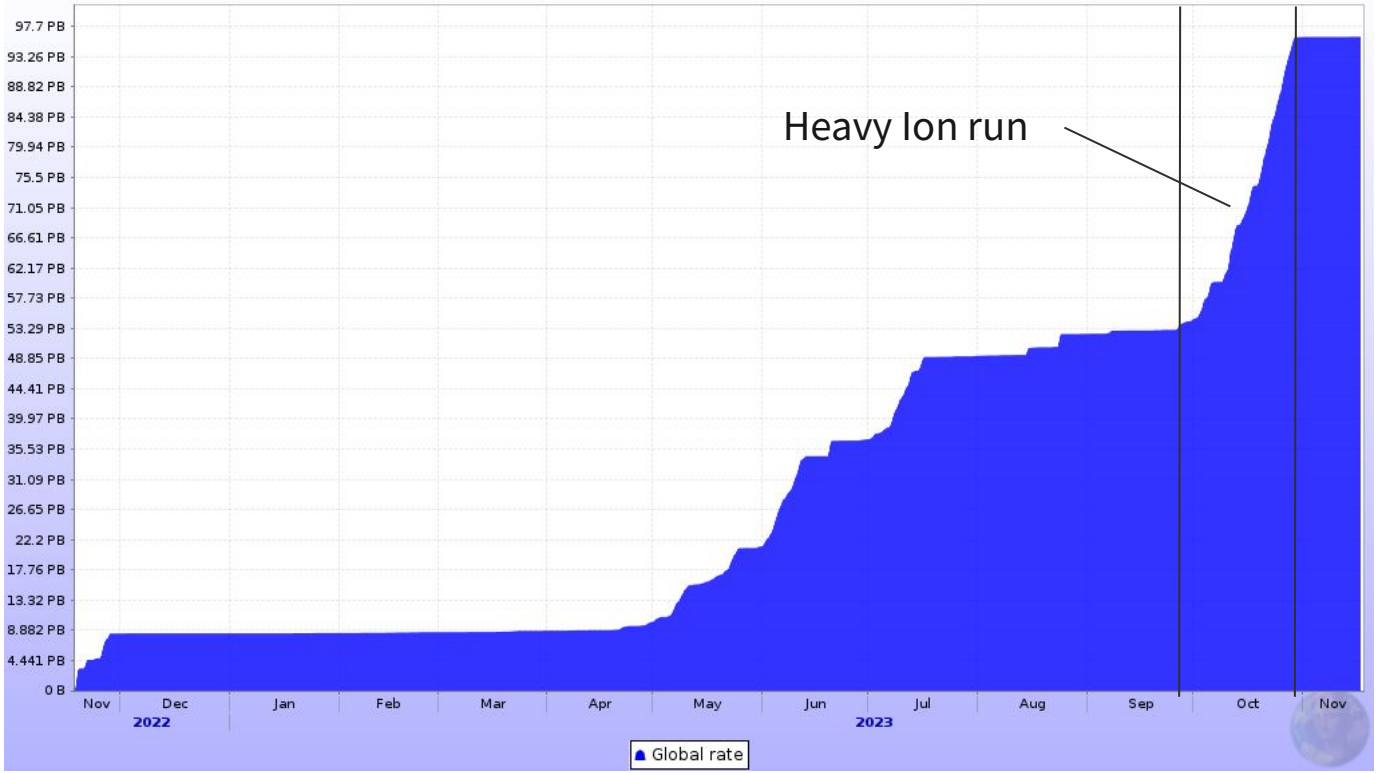


With some hardware reconfigurations we were able to reach 20 GB/s to CTA

EOSCTAALICE data on tape (last year)



EOSALICEO2 data on disk (last year)



Thanks a lot for attention!
Questions?