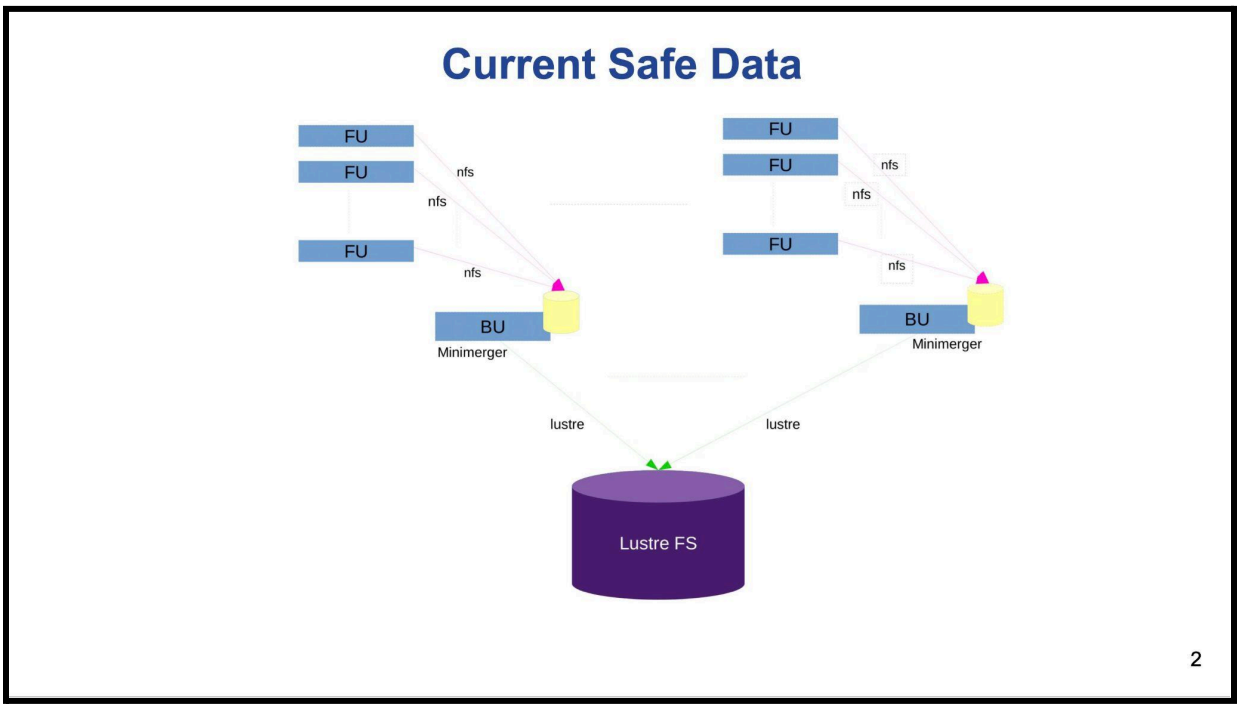
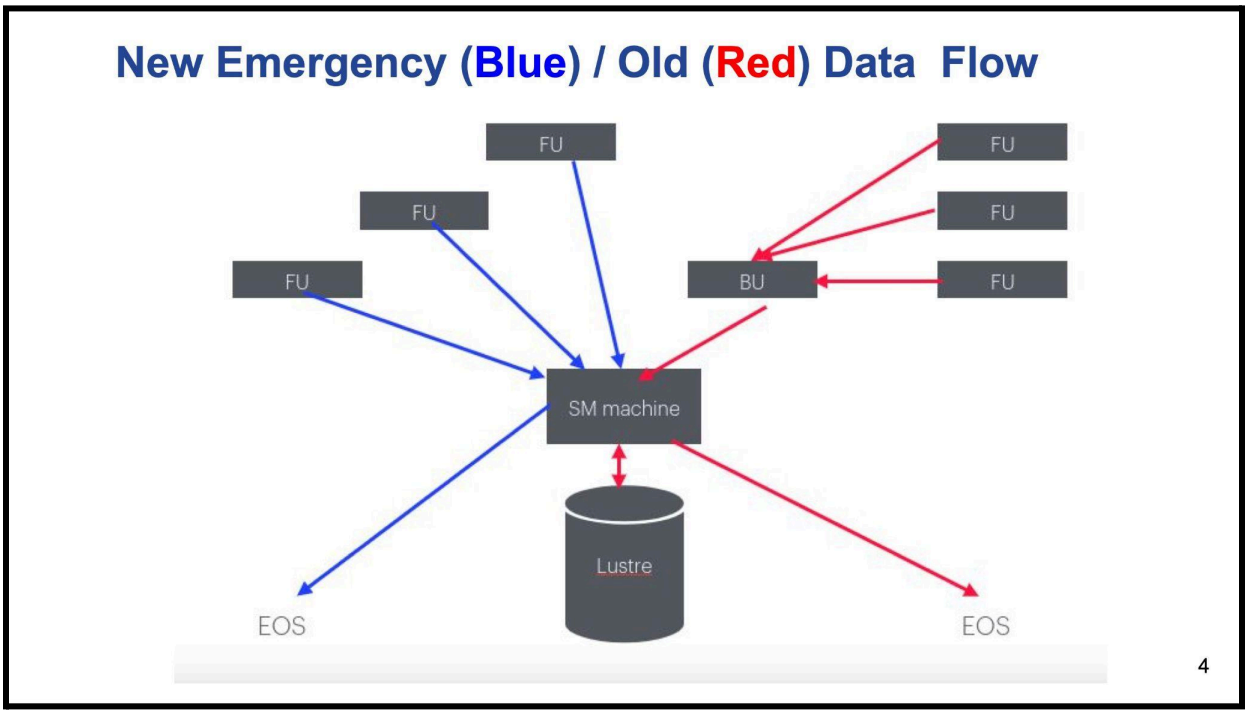
CMS HI Flow

Current flow: FUs ➔ 50-60 RUBUs ➔ Lustre ➔ EOS (via SM nodes) ⇒ 18 GB/s



HI flow: FUs ➔ 8 SM nodes local SSDs ➔ EOS ⇒ 16 GB/s



(1) Throughput for writing to the EOS instance, file sizes, and the number of streams.
Average ~15GB/s (Peak 18-20 GB/s) all along (from SSDs during fills and from lustre during interfills).
File sizes and number of streams in the discussion ⇒ In discussion.

(2) How many days the experiment buffer can sustain the load, with a minimum requirement to last through a weekend.
The Lustre buffer at P5 has a capacity of 1.3 PB, which would last approximately 21 hours (without any transfers from Lustre to EOS), assuming a constant data-taking rate of 17 GB/s during fills. This calculation is based on the assumption that a 50% LHC duty cycle allows enough time for data to be transferred to EOS, preventing backlog accumulation. However, if the duty cycle is higher or transfers to EOS are delayed for any reason, data will accumulate, and the Lustre buffer could reach capacity and remain full in less than one weekend.

(3) Tier 0 activities: throughput for both reads and writes on EOS across different activities (e.g., repacking, reconstruction). Be sure to sum up the concurrent reads and writes, as well as the number of streams involved in both.
Average 60-75GB/s of read/write operations including transfers from P5 and transfer to CTA buffer. I/O is primarily from the batch system with 50-100k CPUs. Only transfers from P5 and to CTA are streamed.

(4) Throughput for exports to Tier 1 sites.
No transfers to Tier 1 sites during data taking.

(5) Throughput for exports to CTA.
Average 15 GB/s

(6) When transferring data to tape and repacking, will the data also be deleted from the buffer? We need to know this since this also has an impact.
Yes

Constant 5.5 GB/s for UPC to collect 10 B events

Hadronic: 30 GB/s at the beginning of the fill 4.6 GB/s at the end (8h) of the fill

2023 data collection limit

2024 data collection limit

Valid for only 4 consecutive fills