# ATLAS input for next Data Challenge

DOMA General Meeting
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on behalf of ATLAS Distributed Computing

Network Data Challenges

- Testing the available bandwidth between main grid sites
  - ATLAS and CMS provided additional transfers between the Tier-1s to inflate the total network traffic

- Aim for first challenge in 2021: 10% of the bandwidth required at HL-LHC: 60 GB/s minimal; 120 GB/s flexible
  - Minimal target often achieved without any additional data ✔
  - Successfully achieved "flexible" target rate twice ✔

- Gradually increase transfer rate between now and Run 4
  - Original plan called for next steps of 30%, 50% and then finally 100% of the expected HL-LHC rate
  - This means that the *next step* is a **factor of three** compared to the previous data challenge (the biggest jump by far)

- Important to re-evaluate these targets and dates with respect the changes (i.e. delays) in the HL-LHC schedule, as well as the experience gained during Run 3

2021 Data Challenge: Total WLCG throughput

Points for next Data Challenge
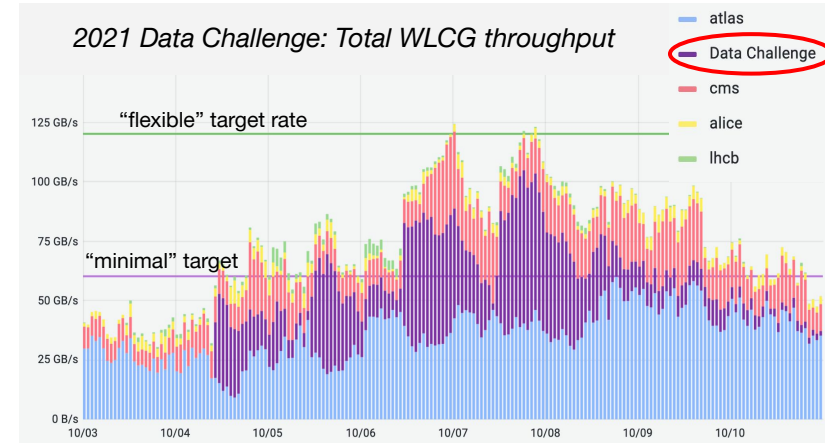
- The key question is when - For ATLAS during the 2023-24 YETS makes the most sense
  - For now we would suggest February 2024, and set a more precise date nearer the time
  - This means after processing of the (now expected to be more significant) 2023 ions data, but before 2024 pp data taking
  - Next year is too soon, and the proposed date may allow for significant changes with respect to the last challenge

- Similar to last time, use a combination of random data from the Tier-0 and fake staging requests to the data carousel to top up the background level of WLCG transfers
  - Two weeks would be better this time, we have more time to plan in advance

- Next question is the nature of the challenge
  - Does it make sense to aim for 30% (minimal scenario: 180 GB/s; flexible scenario: 360 GB/s), or rather simply stress test the network to reveal the current best rate achievable? Would need strong(er) coordination with the sites..

- What about the tape challenge? Are we repeating this, any advantage before say end of Run 3?
  - The last tape challenge was verifying current data taking and non-data taking modes, i.e. readiness for Run 3
  - We do not want sites to invest in "temporary" hardware for this, or to invest too early for HL-LHC - likely their view too
  - Re-evaluate after full year of data taking at the end of 2023
  - Also improve communication of hardware refresh schedules with the T1s and T2s

DOMA tests of technologies

- Authentication with tokens: Any experiment opinions?
  - Yes, ATLAS would like to include this for the disk end points on the 2024 timescale

- Software-defined networks: Are there experiment specific plans regarding usage of SDNs?
  - SDNs: Regulated networks, better monitoring, "free" bandwidth
  - NOTED, AutoGOLE/SENSE and ALTO are progressing at various levels of Rucio and FTS integration
  - Would be interested in testing throughput improvements by selectively enabling SDNs during the Data Challenge

- Monitoring: Suggestions for improvement and verification of existing implementation
  - The joint monitoring and dashboard was definitely appreciated last time, and any further improvements are welcome
  - Extending this to the tape challenge would be welcome, although not urgent this time around unless we include this