

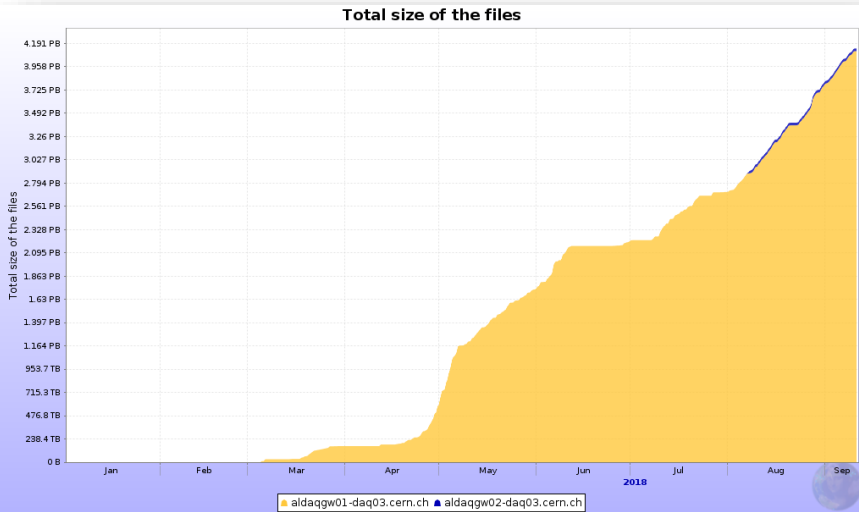
A Large Ion Collider Experiment



ALICE Status Report

Predrag Buncic

Data taking progress

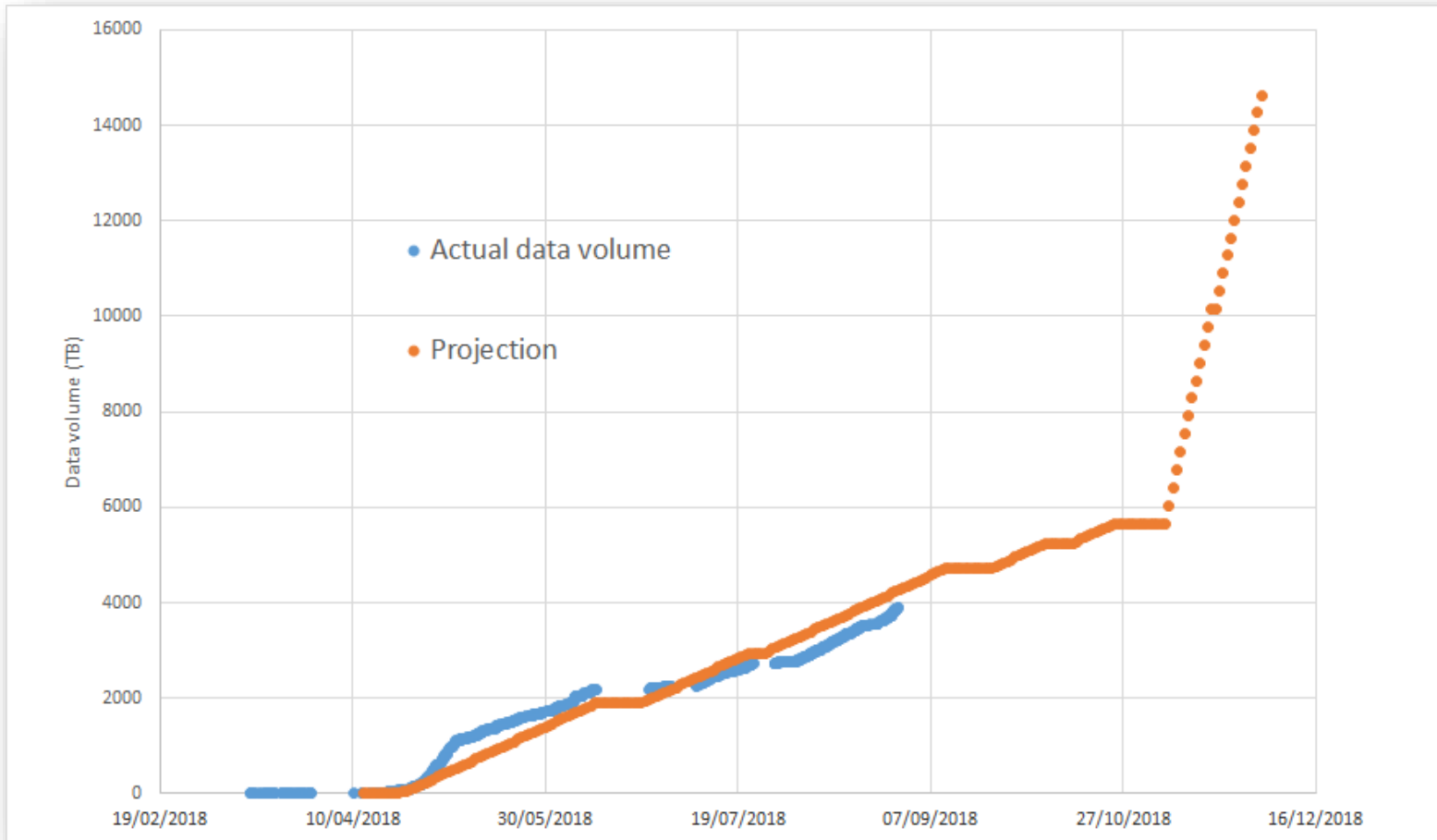


- Smooth data taking
- 4.1 PB registered and replicated to T1s

- 2018 pp data reconstruction going very well

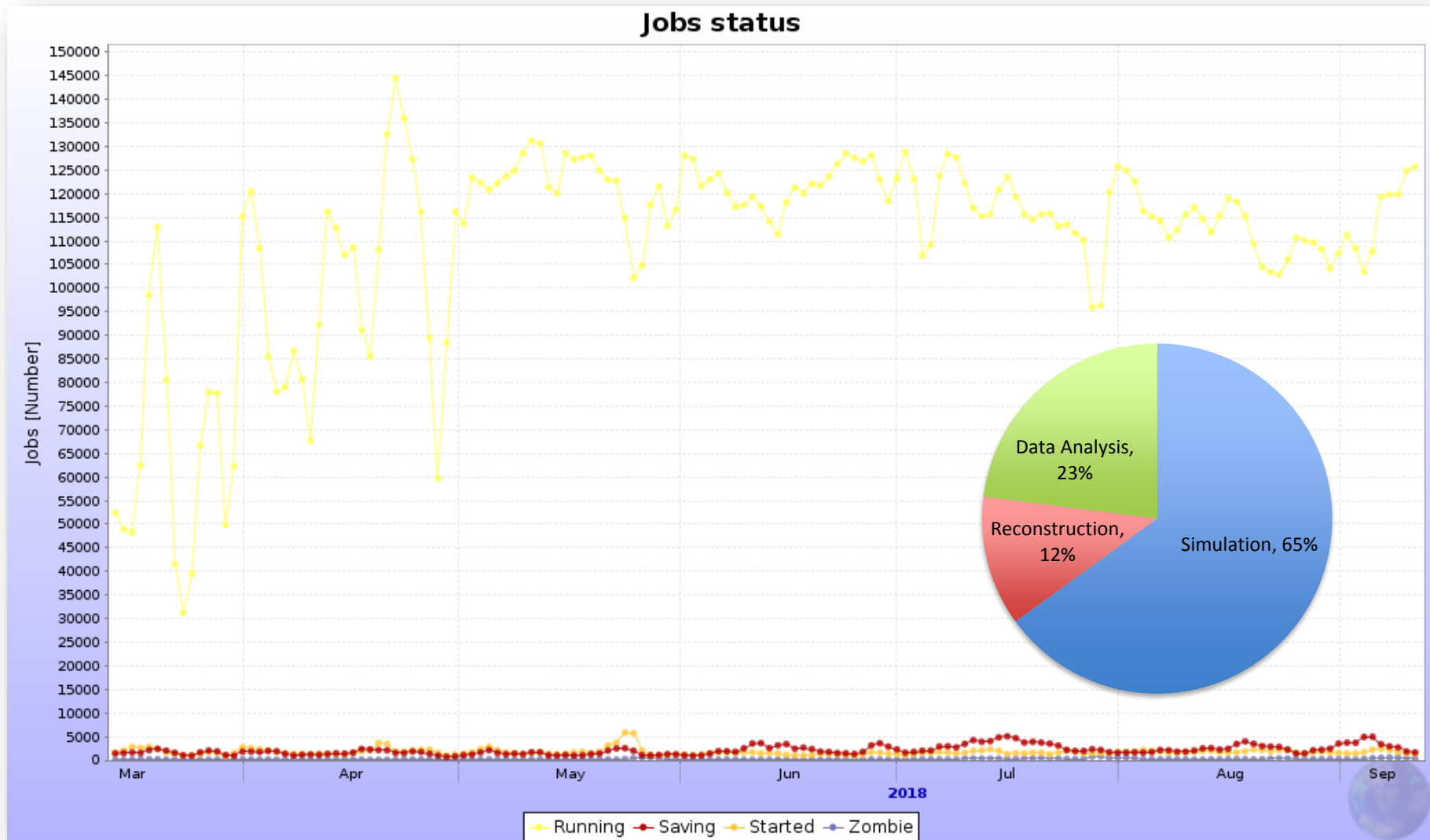
PERIOD	COLLISION	MAG FIELD (T)	INT. RATE (kHz)	muon_cal o	CPass0/C Pass1	Manual Calib	PPass	QA and run lists
LHC18b	pp 13 TeV	B=-0.5	Feb-80					
LHC18c	pp 13 TeV	B=-0.2	125					
LHC18d	pp 13 TeV	B=-0.5	195					
LHC18e	pp 13 TeV	B=-0.5	190					
LHC18f	pp 13 TeV	B=-0.5	195					
LHC18g	pp 13 TeV	B=+0.5	20-160					
LHC18h	pp 13 TeV	B=-0.5	195					
LHC18i	pp 13 TeV	B=+0.5	20					
LHC18j	pp 13 TeV	B=-0.5	190					
LHC18k	pp 13 TeV	B=-0.5 (dipole 0)	20-140-160					
LHC18l	pp 13 TeV	B=-0.5	190					Ongoing
LHC18m	pp 13 TeV	B=+0.5	5-50-190-250	Running	Running			2

Data volume

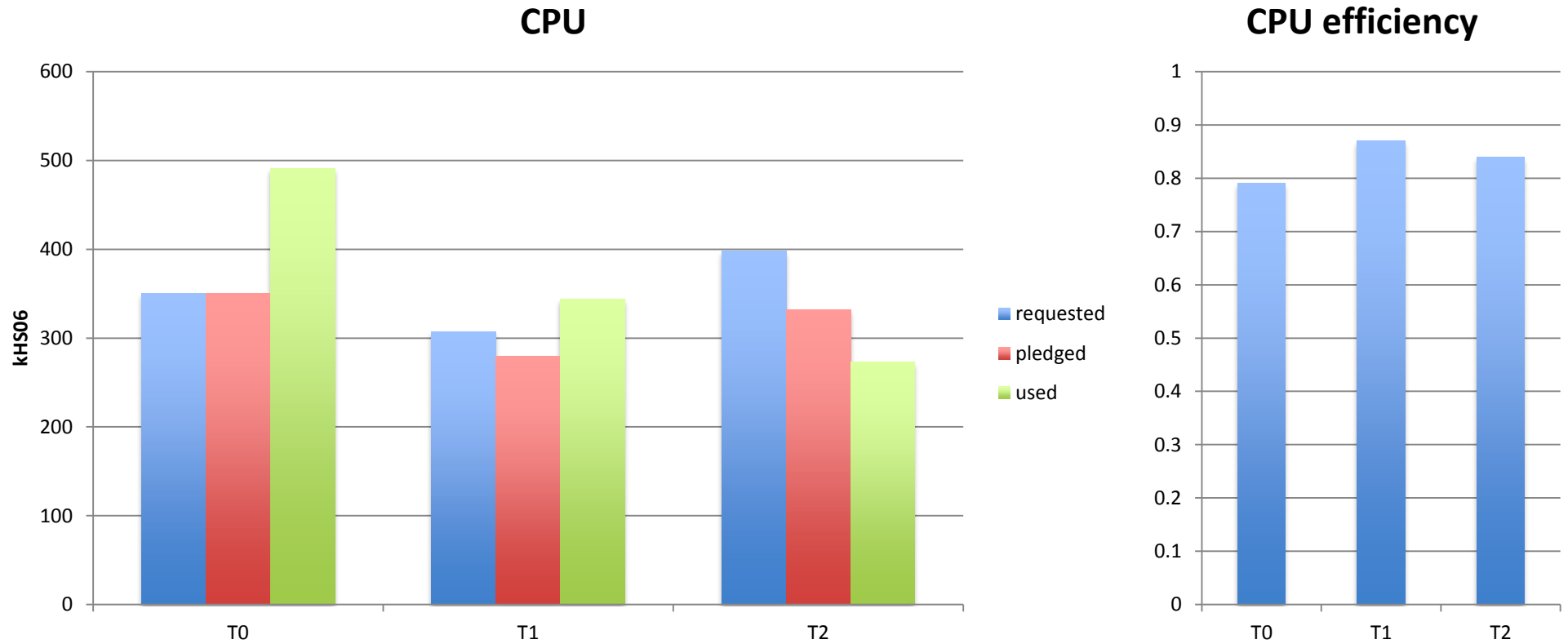


- Projection based on pp evt size of 1.7 MB (@ V0and = 150 kHz) and 430 Hz TPC read-out
- Matches the expectations, no change in parameters used to calculate computing requirements

CPU Usage



CPU Usage

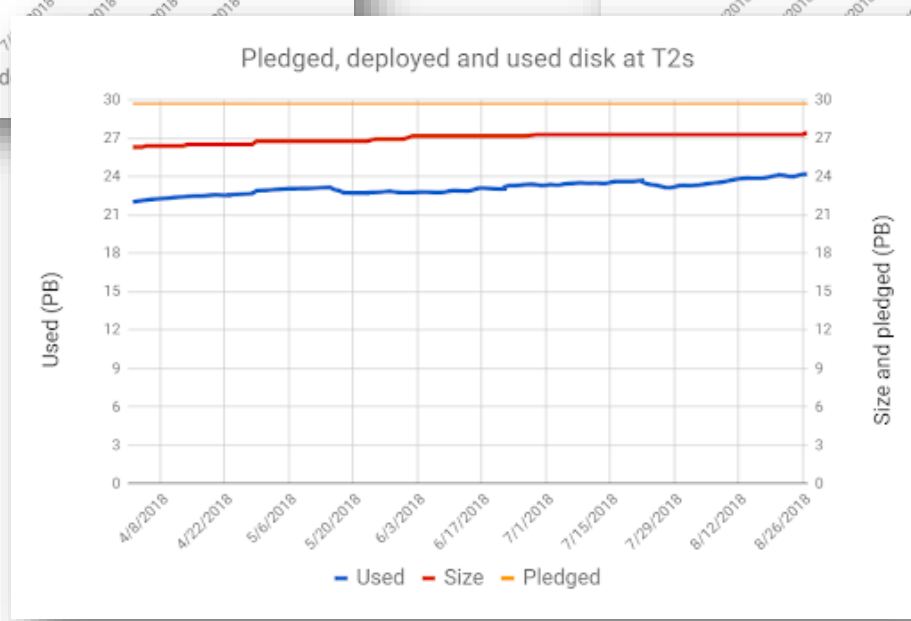
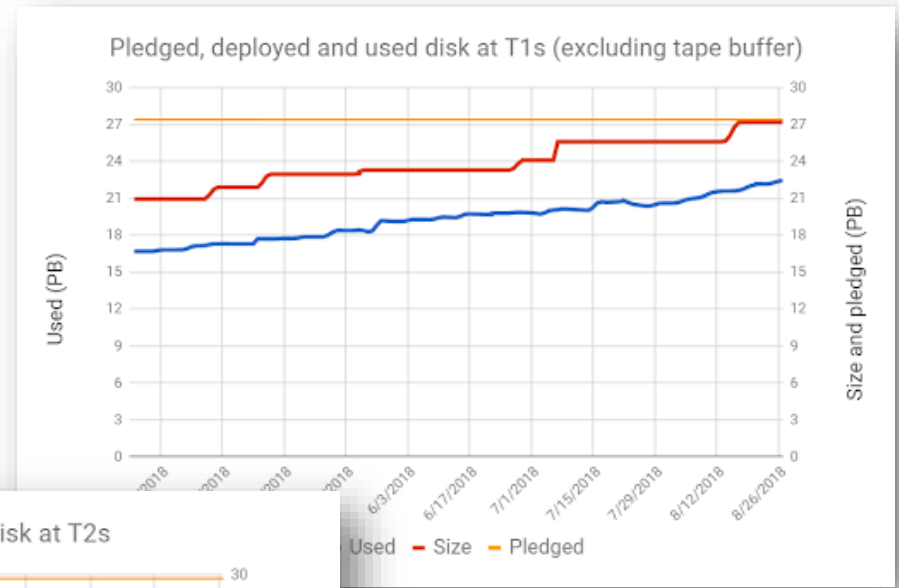
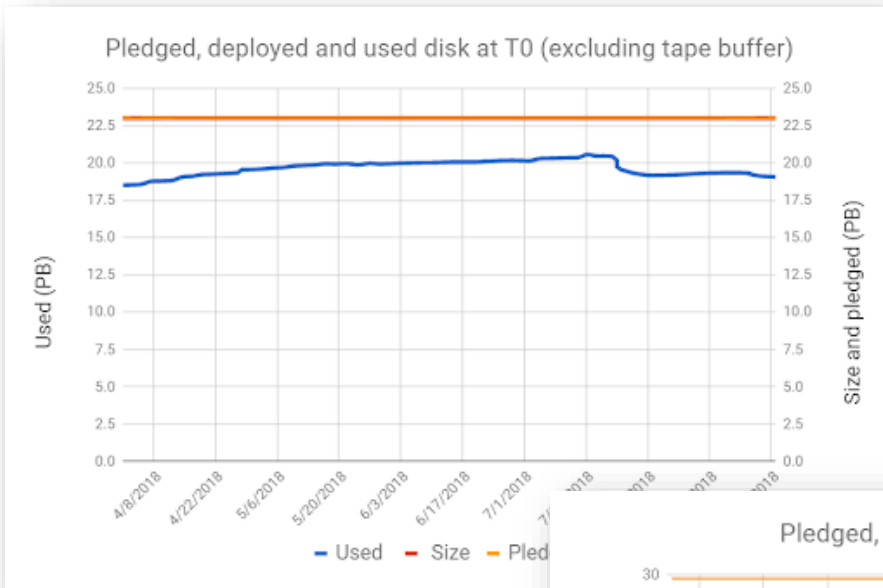


- Good utilization of opportunistic CPU resources in particular at CERN
- CPU efficiency remains constant at ~83%

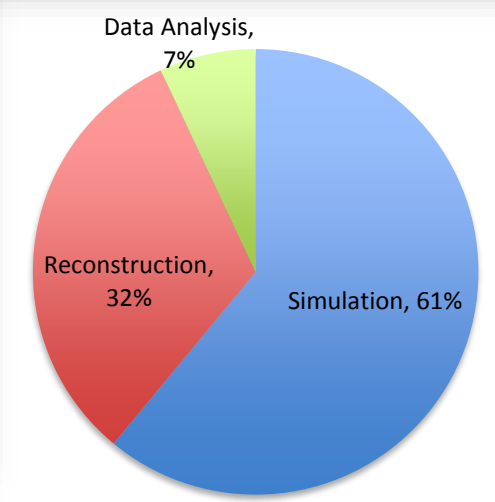
Measures to address shortage of disk

- For 2019 CERN decided to pledge only 5 PB of disk (out of 8.1 PB approved by C-RSG)
- According to computing resource sharing procedure as defined by the ALICE Constitution, the CERN pledge reduced by 3.1 PB in 2019 will automatically increase obligations of other FAs in proportion to their M&O share.
- Given that there was no significant changes in any of the relevant parameters used for the resources calculations, the overall request remains the same as presented in April except for rebalancing of the disk space as a result of reduced T0 pledge
 - France will add +0.5 PB and Germany up to +1.0 PB on top of 20% year-on-year increase
 - Russia, UK (and hopefully Italy) will implement at least their share
 - Additional resources in Bergen (Nordugrid) should bring them above their nominal share

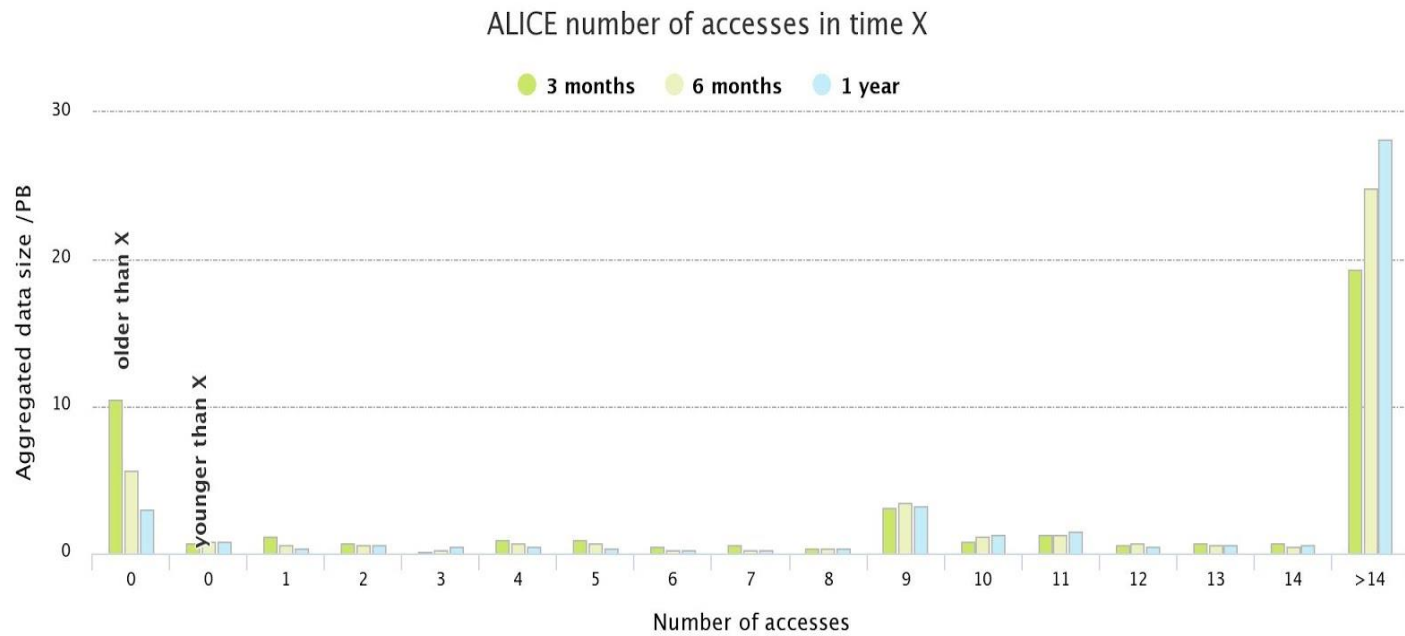
Disk Usage



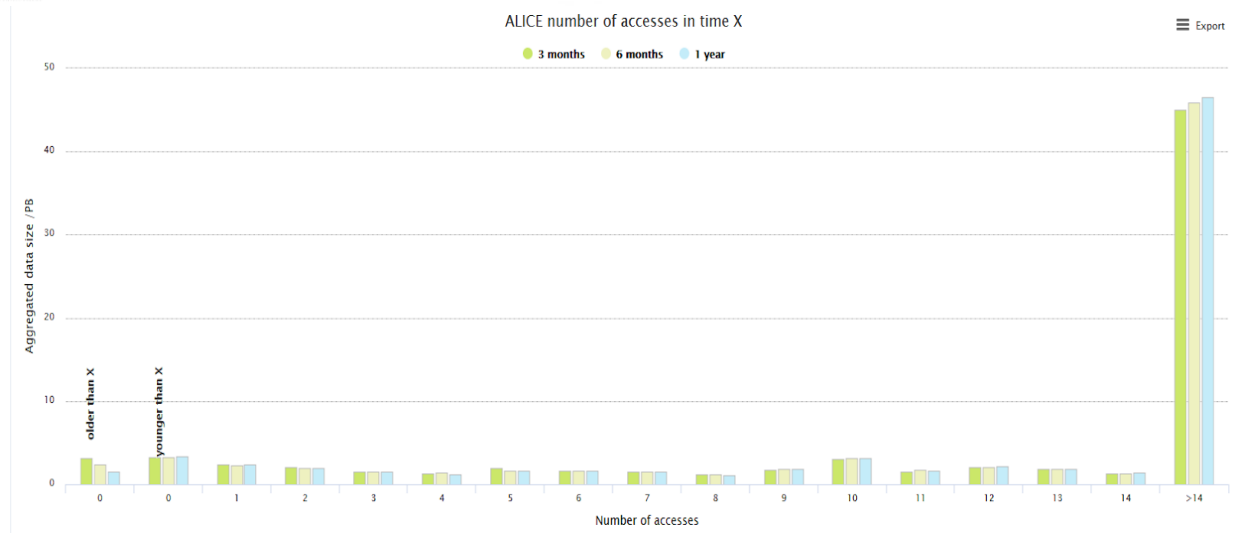
- Cleanup started across all tiers
- Data moved from T0 to make a room for PbPB data taking

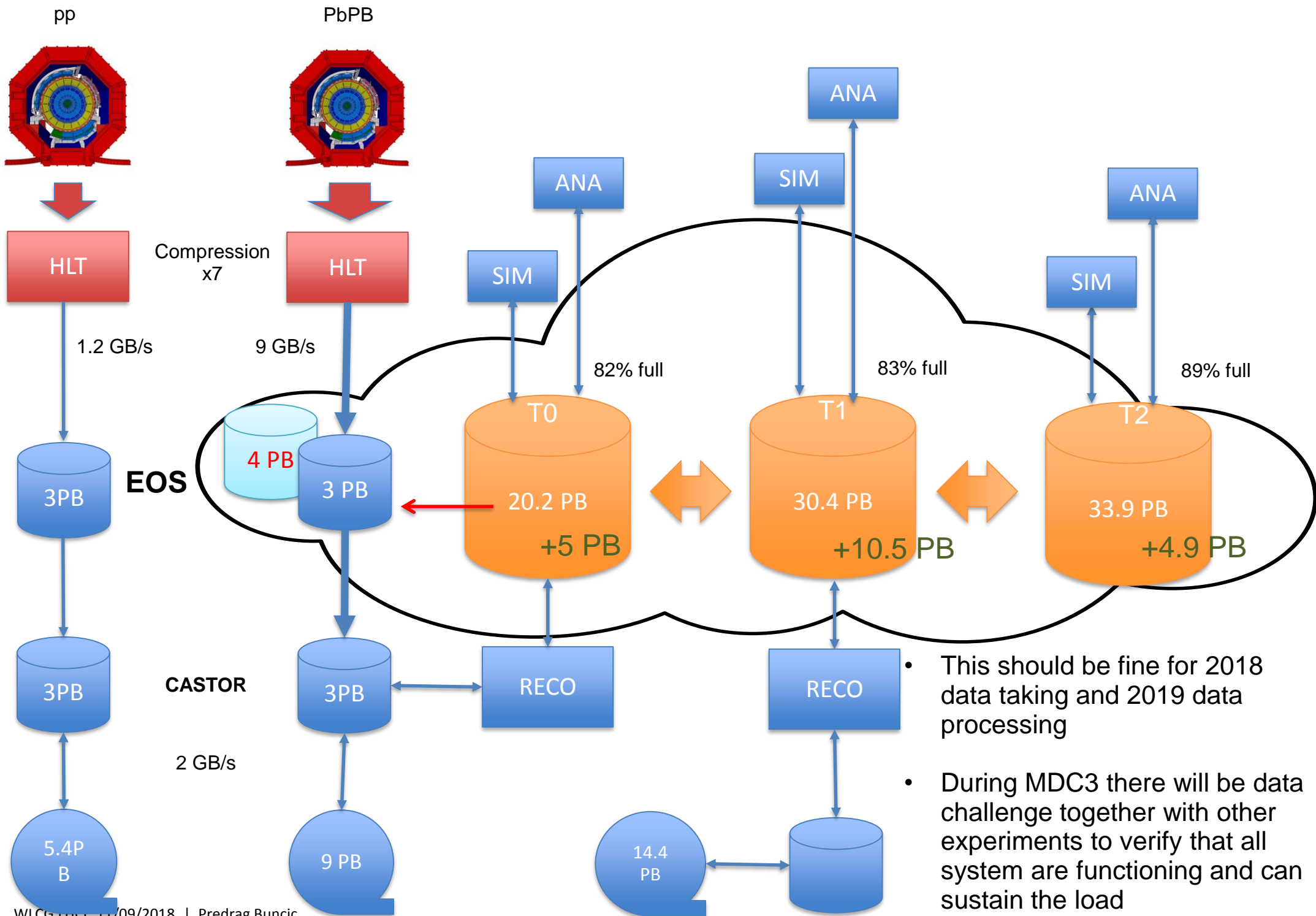


Data popularity



- No dormant data left on disk

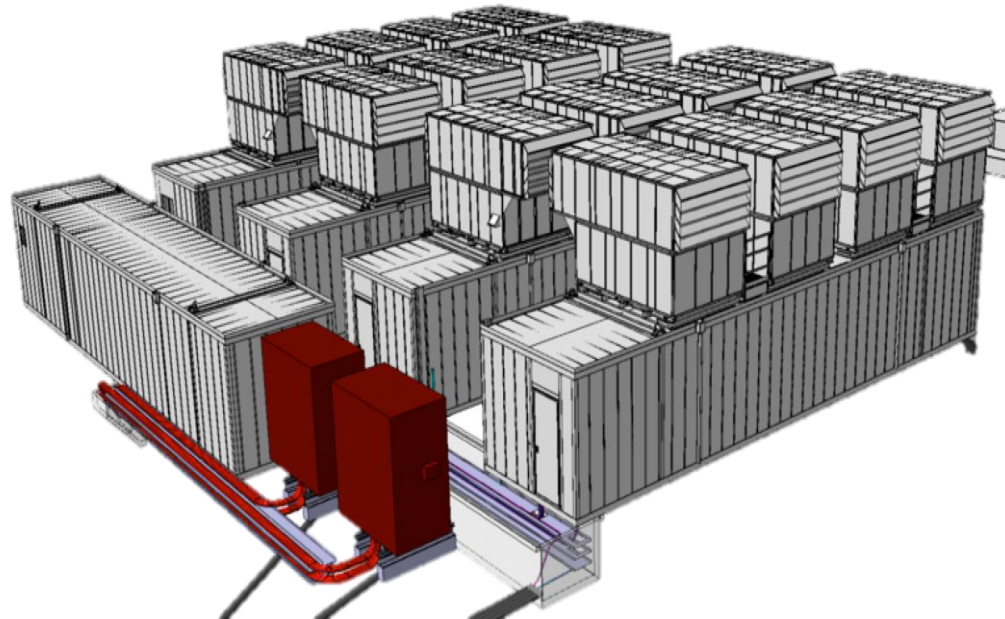




• This should be fine for 2018 data taking and 2019 data processing

• During MDC3 there will be data challenge together with other experiments to verify that all system are functioning and can sustain the load

O² Facility – from a drawing board to reality

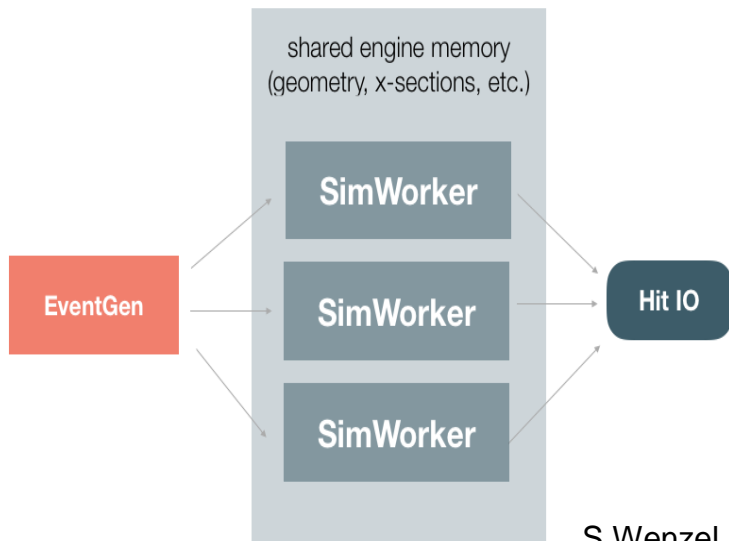


Installation
(power module)
starts next
week....

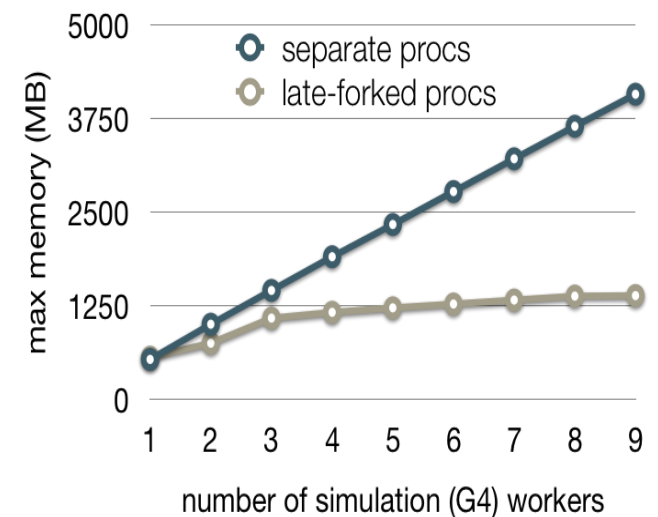
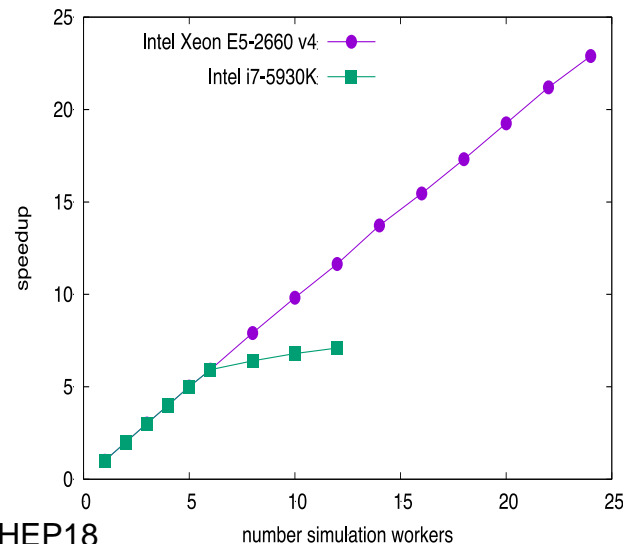


Run 3 software: Parallel high-performance simulation framework

- Development of a scalable and asynchronous parallel simulation system based on independent actors and FairMQ messaging
- Supports parallelization of simulation for any VMC engine
- Supports sub-event parallelism
 - Make simulation jobs more fine-granular for improved scheduling and resource utilization
- Demonstrated strong scaling speedup (24 core server) for workers collaborating on few large Pb-Pb event
- Small memory footprint due to particular "late-forking" technique (demonstrated with Geant4)
- In result, reduce wall-time to treat a Pb-Pb events from O(h) to few minutes and consequently gain access to **opportunistic resources**

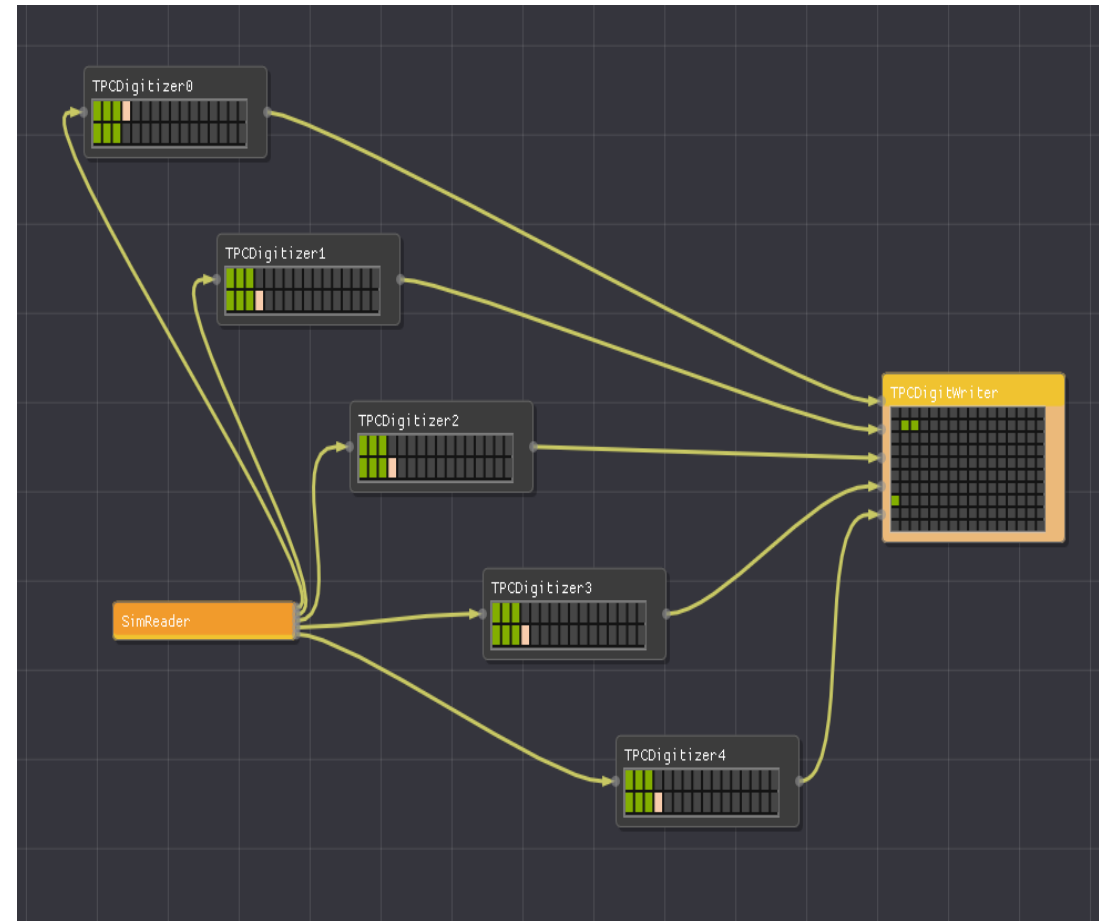


S.Wenzel @ CHEP18



Run 3 software: Data Processing Layer (DPL)

- O2Data Processing Layer (DPL) on top of ALFA to simplify and reduce user code and abstract away common problems of distributed systems
- Simulation algorithms using hits (digitization, clusterization) integrated into the O² DPL
 - “From purely sequential task-based processing to data-driven parallel treatment using FairMQ messaging”
- Demonstrator for TPC
 - Parallel, sector-based, digitization and collaborative subtime-frame building
 - Background-signal merging techniques



- Data Processing Layer (DPL) GUI, debugging and developing environment

Summary

- 2018 data taking and processing is progressing well
- CPU resources available and used beyond the pledge
- Disk is critical in a view of the upcoming PbPb run
- Given that CERN is not in position to fully implement the request in 2019 saving measures were implemented
 - Disk liberated by (re)moving EOD/AODs, re-packing data archives and removing redundant information
 - Completely removed dormant data from disk
- Thanks to T1s who stepped in to fill the gap, are expect to be ready ready of PbPb data taking and data processing in 2019
 - We will still require the additional disk resources in 2020 (no additional CPU and no additional tapes).
- Good progress in development of parallel high performance simulation framework based on O2 DPL and ALFA for Run 3