

SURF 100G link & DUNE DAQ+Computing

DAQ, 09.04.24

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based on discussion with Jolie and Mike



Context

- FNAL Networking has been operating under the assumption of the experiment needing 100G WAN link at SURF by 2026
 - ▶ That has not been the case for a long while
- FNAL Networking obsolete 100G need-by date highlights that we are missing a high-level DAQ + Computing commissioning plan to set detailed requirements on "infrastructure"
- Focus on 100G, but no detailed requirements on 10G in place either
 - ▶ Small but non-zero risk of "perturbing" installation if not available according to requirements
 - ▶ e.g. what guarantees on 10G bandwidth?



Schedule and WAN

- When is the 100G WAN required?
- 100G need-by date is driven by readiness fo physics
 - ▶ Basically anchored to the "Start of Physics" milestone
 - ▶ When "Start of Physics" moves, the 100G need-by requirement moves as well
- **Note** : Similar considerations apply to the 10G connection and installation
 - ▶ for what FNAL data transfers are concerned
- **Important**: the installation schedule of the first module is the driver.
 - ▶ Assuming here that the second module doesn't have an impact.



DUNE schedule

- **DUNE detector installation order swap in progress**
 - ▶ Shorter installation and filling times of the VD module, now the first one
 - ▶ New schedule expected by the end of the month (as far as I know)
- **Risk of delays will persist for a while longer**
 - ▶ Expect the need-by dates to move/oscillate for a while longer
 - ▶ Need a structure in place to provide updates as the project evolves.
- **Opportunity to start developing a (high-level) DAQ-Computing commissioning plan**
 - ▶ and encode it in the project tracking (P6???)
 - ▶ with correct dependencies
 - ▶ and let the logic do the rest of the work

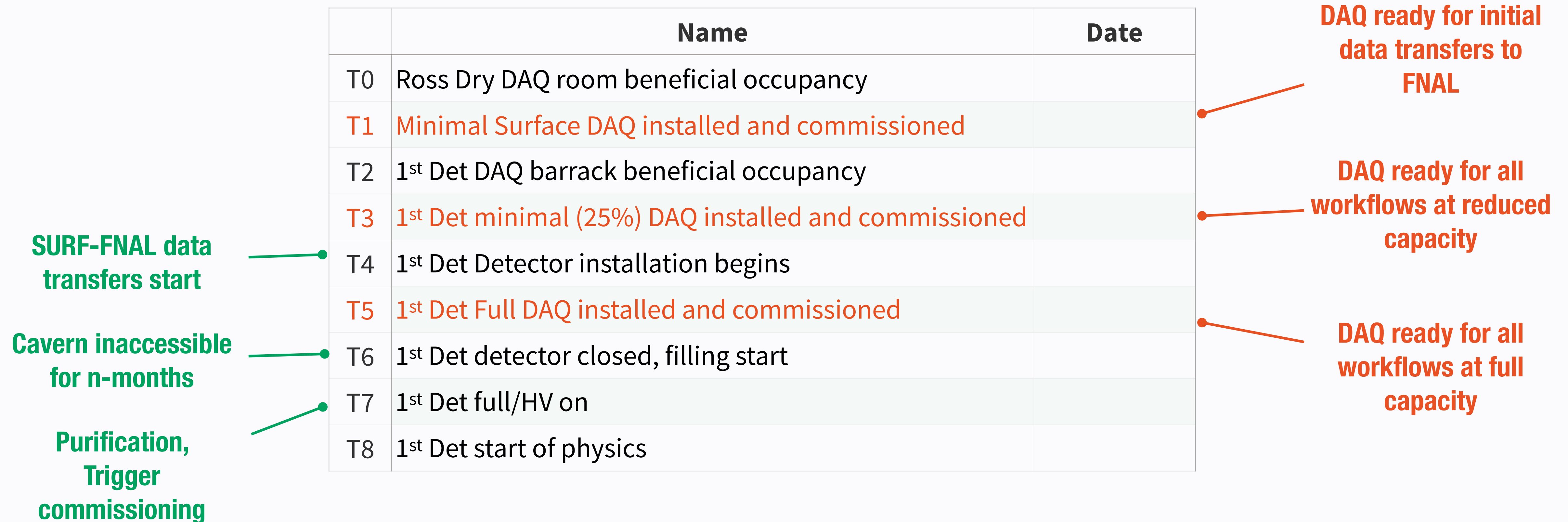


DAQ Installation in a Nutshell

- **Drivers**
 - ▶ Beneficial occupancy of the surface and underground DAQ rooms
 - ◆ Ross Dry basement
 - ◆ FD1 DAQ Barrack
 - ◆ FD2 DAQ Barrack
 - ▶ BO assumes power, cooling and network available
- **Staged installation, to minimise equipment premature obsolescence**
 - ▶ Two installation stages for surface and each underground barrack
 - ◆ 1. Full readout network, 25% readout server, minimal CCM, DQM and storage
 - 25% simultaneous readout capacity, full detector coverage
 - Sufficient for installation requirements
 - ◆ 2. 100% readout, CCM, DQM, trigger and storage
 - 100% simultaneous readout capacity



DAQ-Detector Timeline



DAQ-Computing readiness

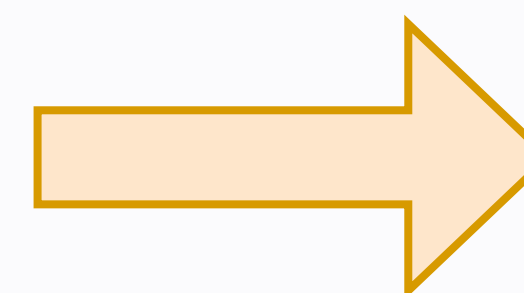
Ready for installation
functional transfer and
declaration systems with
workflows at reduced capacity

	Name	Date
T0	Ross Dry DAQ room beneficial occupancy	
T1	Minimal Surface DAQ installed and commissioned	
T2	1 st Det DAQ barrack beneficial occupancy	
T3	1 st Det minimal (25%) DAQ installed and commissioned	
T4	1 st Det Detector installation begins	
T5	1 st Det Full DAQ installed and commissioned	
T6	1 st Det detector closed, filling start	
T7	1 st Det full/HV on	
T8	1 st Det start of physics	

Ready for first physics
fully commissioned transfer
system with all workflows at full
capacity

Need to define readiness details at each stage

- ▶ What workflows?
- ▶ What performance at what capacity?

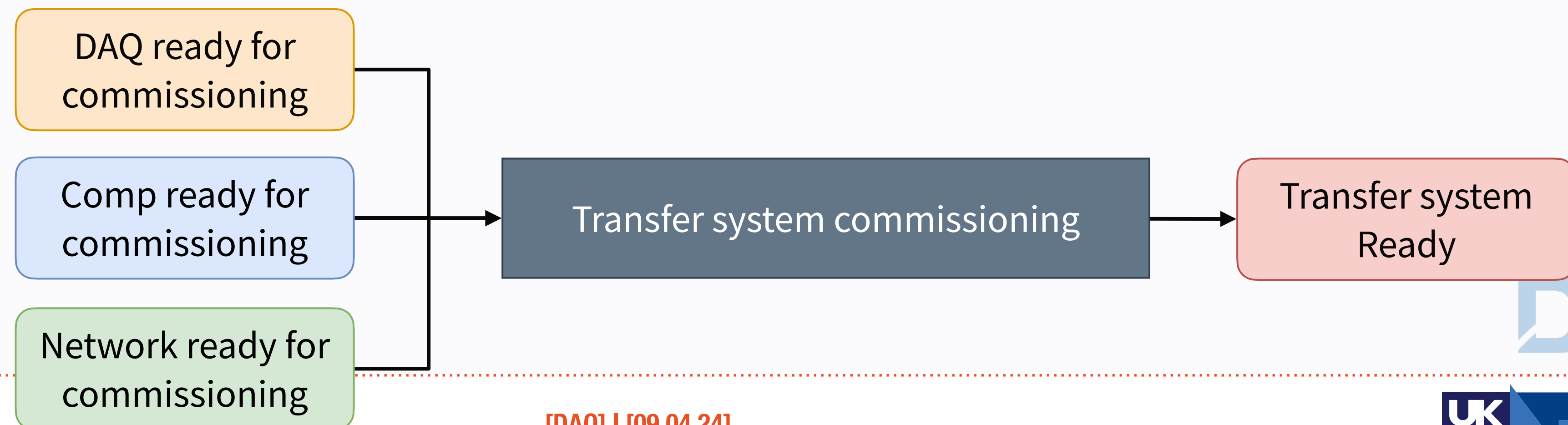


**Driver for
commissioning plan**



Transfer commissioning plan

- Full transfer system commissioning plan defines the need-by date of the 100G link
 - ▶ Same for functional commissioning at 10G
- Need to draft a list of potential tests and data challenges between DAQ and Computing
- And the required readiness for each for
 - ▶ DAQ : equipment, infrastructure, ...
 - ▶ Computing: equipment, software, ...
 - ▶ Networking: bandwidth, quality of service, ...



DAQ-Detector Timeline - Pre-swap

	Name	Date
T0	Ross Dry DAQ room beneficial occupancy	Jul. 25
T1	Minimal Surface DAQ installed and commissioned	Aug. 26
T2	1 st Det DAQ barrack beneficial occupancy	Aug. 26
T3	1 st Det minimal (25%) DAQ installed and commissioned	Dec. 26
T4	1 st Det Detector installation begins	Oct. 26
T5	1 st Det Full DAQ installed and commissioned	Mar. 28
T6	1 st Det detector closed, filling start	Apr. 28
T7	1 st Det full/HV on	Jun. 29
T8	1 st Det start of physics	~Aug. 29

! Obsolete! !

Possible changes with swapped schedule (to be confirmed)

- ▶ Further delays in cavern delivery (T0 moves later)
- ▶ Faster detector installation and filling (T6 and T7 closer to T4)



Back to the start: 100G need-by date, when?

EFIG
Experiment
Facility
Interface
Group

- Request to provide input to the next EFIG meeting
 - ▶ Scheduled on 17th April
- If the the described approach seem reasonable, working out a commissioning plan will take a few iterations, even at high-level
 - ▶ I stop here: does the described approach seem reasonable? Comments are welcome
- Given everything else going on, I suspect there won't be time
- Can we instead come up with a very rough estimate of the DAQ-Computing transfer commissioning time and target completion milestone?
 - ▶ e.g. 9 month commissioning, ready for HV on of the 1st detector.
 - ▶ $T_{100G} = T7 - 9mo$



Thank you!

Comments, please!

