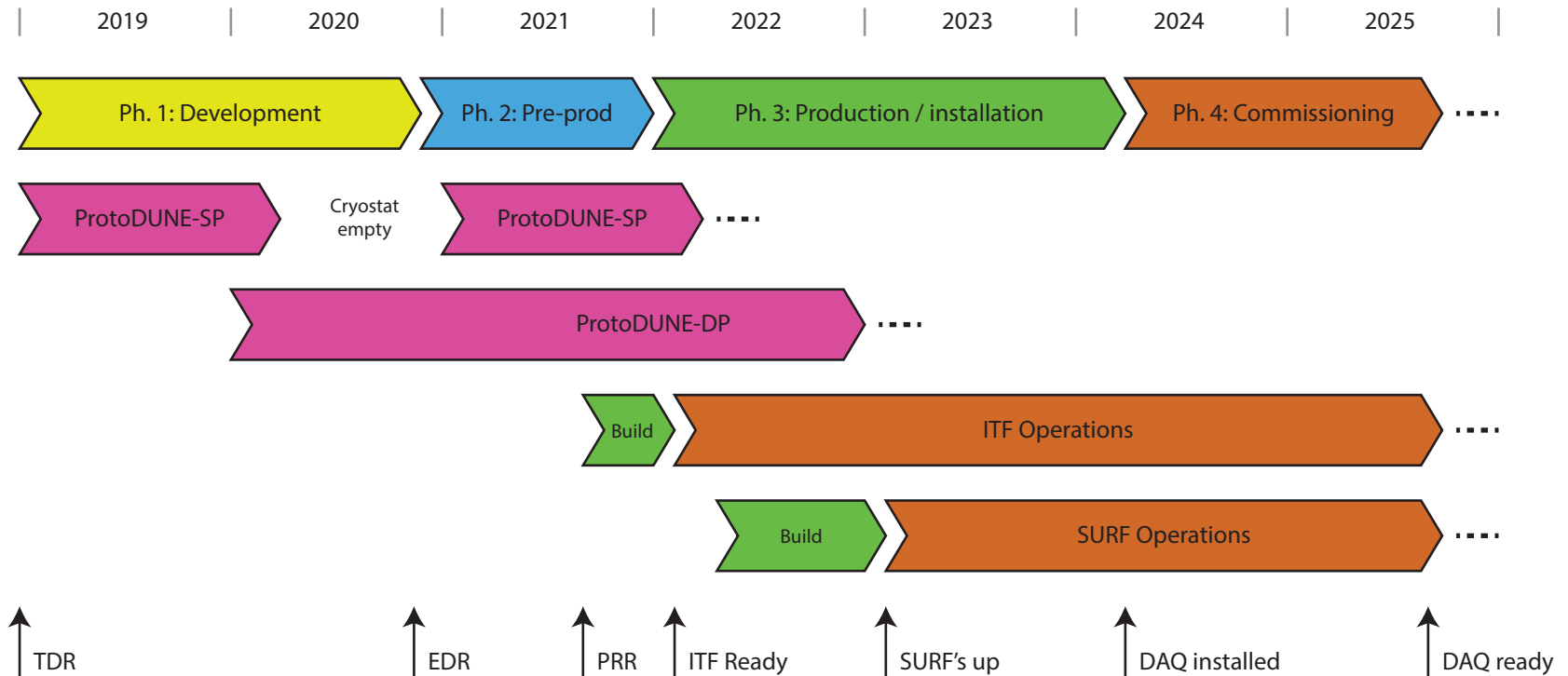


4th DUNE DAQ Workshop: Introduction

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Overall DAQ Timeline



- We know that the international schedule is evolving
 - Underground delays may not have significant effects for DAQ
 - The change of role of the ITF makes our life simpler, if anything
- Appropriate time for EDR prob. 21Q2 – maybe with infrastructure earlier

Situation Today

- Consortium in good shape
 - TDR coming together well, responsibilities being taken
 - New institutes actively seeking to participate, new funding requests in
 - However: insufficient activity in some areas, parallel developments in others
- Requirements, specs, interfaces reaching stability
 - Still some concern about unrealistic top level uptime requirement (99.5%)
 - DAQ specifications now understood and (mostly) justifiable – still work on calibration
 - Important for all consortia to understand that interface contracts are taken seriously
- Design process
 - Conceptual design is ‘blessed’ (now we need to explain it better...)
 - We appear to be in good shape w.r.t. power, space, cost, operations model
 - Full technical design needs to be validated by EDR, 2021 – not just the ‘interesting bits’
- What is missing?
 - Mostly, people
 - Realistic simulation / emulation; online software plan; demonstrators for key technologies

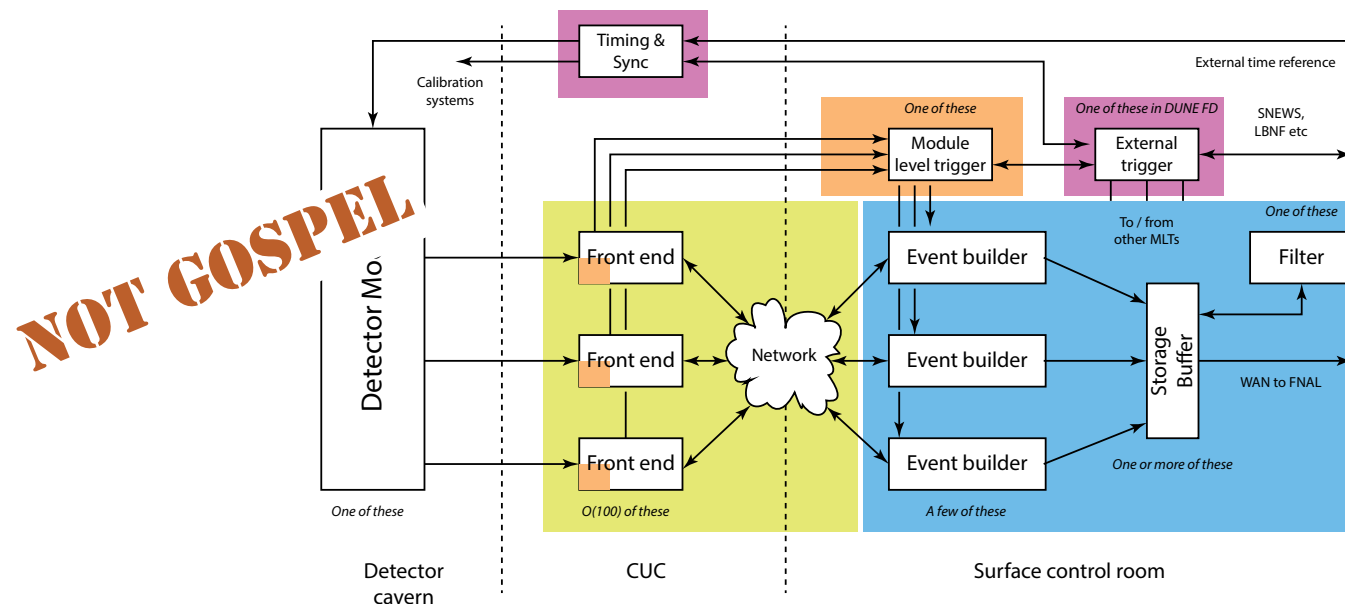
Goals Up to EDR

- Parallelise work across DAQ subcomponents
 - Now have enough understanding of the ‘big picture’ to do this
 - Cannot make sufficient progress unless we split the problem up formally
 - This means, in some cases, letting others make mistakes...
- Test trial implementations of subcomponents
 - We have enough time in 2019 to try ideas and learn from the results
 - Priority to areas where design is dissimilar from ProtoDUNE DAQ mk 1
- Continue ProtoDUNE(s) engagement
 - A almost unique opportunity in HEP to ‘try before you buy’!
 - Living, working testbed for all of our implementation ideas ...
 - ... but we need to provide working DAQ for others, at CERN and many other places
- Finish the formal planning process
 - Whatever the schedule, we look to be on the critical path
 - Plan needs to be smooth and well understood by – maybe before – 2021
- Write an Engineering Design Report (AKA ‘full-fat TDR’) – yet more fun

Goals for the Workshop

- Agree boundaries of scope for the basic subsystems
 - Such that we can agree who is doing what and what the interfaces are
 - Seek to simplify interfaces even if it means complicating implementation
- Agree strategy and outline plan for ProtoDUNE in 2019 / 2020
 - What do we need to do? When do we need to do it?
 - What are the interdependencies between subsystems and with others?
- Identify other work areas during the period up to the EDR
 - What do we need to do that is not focussed on ProtoDUNE?
 - e.g. simulations, DAQkit, slice tests with detectors
- Establish the organisation and coordination roles in each area
 - We need to leave knowing who is doing what, and who is coordinating
 - If the answer is 'nobody' in any critical area, we have a problem
 - I would like to leave politics at the door – there are important roles for everyone
 - But: commitment at this stage is a serious thing, for at least two years

Breakdown of Activities



- My starting suggestion:
 - ▶ Subsystems: front end; back end; data selection; timing & interfaces
 - ▶ Software and computing: CCM; databases & tools; online systems
 - ▶ Coordination: management; infrastructure & installation; ProtoDUNE; release coordination
- This is up for discussion – but let's not go into tomorrow without a proposal
 - ▶ NB: Not all areas have equal priority in 2019, but need to start progressing

After the Workshop

- Begin organisation of each work area
 - Work up detailed task list and milestones for 2019/20
 - Later: Revisit estimates of final cost and time line
- Revisit interface specifications
 - Between subsystems, and with other consortia
- Develop ProtoDUNE work plan for 2019
 - Operational: how do we support what we have in place?
 - Development: what tests do we need to do, and when?
 - Vertical slice: what preparations are needed for 2020?
 - We have only ~one year to get this done, and the opportunity will not be repeated
- Put in place project office for coordination activities
 - This is the glue to tie together the rest of the project
 - Set down planning for cross-work area activities (e.g. DAQkit)

What do we Need to Know?

- Key information needed from each area
 - ▶ Where are we today?
 - ▶ What state must things be in by end of 2019? End of 2020?
 - ▶ What steps are needed to get there?
 - Lab development; simulations; practical tests at CERN and elsewhere; tests with detectors
 - ▶ What resources are needed? Do they exist?
 - ▶ What dependencies on other things exist?
- My expectation
 - ▶ We do not have all of this information, but we have enough to see the gaps
 - ▶ We have only the bare bones of a plan for CCM
 - But there will be many dependencies – so this is a priority for early development
 - ▶ There are some areas where discussions can proceed at lower priority
 - Databases & tools; data selection implementation; online systems
- This may be totally wrong – let's find out

ProtoDUNE Planning

- Read Roberto's and Karol's talks from last week!
 - ▶ <https://indico.fnal.gov/event/16764/session/17/contribution/181>
 - ▶ <https://indico.fnal.gov/event/16764/session/17/contribution/183>
- Will reprise these as the basis for tomorrow's discussion
- Basic plan:

- ▶ 2019: Long term stability and technology development plan
- ▶ 2020 / 2021: Emptying, opening, upgrade
- ▶ 2021 / 2022: Second Beam Run
 - DAQ will be 'busy' at SURF by then...

- DAQ allocations

- ▶ 'DAQ-D' day every Friday, i.e. we are not 'up'
- ▶ DAQ development periods, in blue ->
- ▶ Use it or lose it – but we need a crew

JANUARY 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
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27	28	29	30			

FEBRUARY 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
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MAY 2019						
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MARCH 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
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JUNE 2019						
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Next Steps

- Today (projector-oriented);
 - ▶ Talk through each work area
 - ▶ Highlight what's known and what's unknown
 - ▶ Need a volunteer to write down discussion points for tomorrow
- Working dinner
- Tomorrow (whiteboard-oriented)
 - ▶ Finish work area discussions
 - ▶ Go through online systems in more detail
 - ▶ Planning
 - ▶ Breakout discussions if we finish early enough
- Let's get on with it