

Upstream DAQ plans for 2021 Q1&2

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DUNE Upstream DAQ Meeting
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Overview

Based on Giovanna's presentation from the [DUNE-DAQ Meeting](#).

Our key targets for 2021:

- Completing interface and specification documents
- Preparing the preliminary DAQ software design review (timing & readout incl.)
- Required functional elements to support DUNE
 - Electronics test stands (e.g.: ICEBERG)
 - HD + VD coldbox
 - Towards ProtoDUNE-II

UDAQ has a wide range and high number of deliverables in 2021!

Roadmap

- **15th March:** dunedaq **v2.4.0** release
 - PD-I WIBs used as data generators, fake triggered data end up on disk
 - Readout in “MiniDAQ App”, DTS controlled by “Timing App”
- **15th May:** dunedaq **v2.6.0** release
 - “Readout App” with multiple FE type support; DAPHNE + WIB2 support
 - Timing TC messages from “Timing App” (consists of TS and ID of fired input)
- **End of July:** dunedaq **v2.8.0** release
 - Main feature addition is the TPs flow
- 1st Nov: v2.10.0 -> Mostly DF related, but support for VD electronics may come up

Roadmap - UDAQ

- **15th March:** dunedaq **v2.4.0** release
 - PD-I WIBs used as data generators, fake triggered data end up on disk
 - Readout in “MiniDAQ App”, PDTS controlled by “Timing App”

In two weeks, but readout still has pending regression tests
- **15th May:** dunedaq **v2.6.0** release
 - “Readout App” with multiple FE type support; DAPHNE + WIB2 support
 - Timing TC messages from “Timing App” (consists of TS and ID of fired input)

Support for new formats and variable sized user payloads
- **End of July:** dunedaq **v2.8.0** release
 - Main feature addition is the TPs flow
 - First integration with ND LAr controller boards (Integrated in Readout App)

Production ready TP firmware and software support in readout

Other “takeaways”

- *“Development must always be preceded by design (including documentation)”*
 - We certainly can and need to improve on this front.
- *“At every dunedaq release, software and corresponding firmware need to be packaged, documented and made available for users”*
 - The new firmware release procedure will be crucial and need to be a well defined foundation for the future firmware development cycles.

Action items - Timing

- Status of hardware commissioning
- Status on uTCA crate shipment to NP04
 - Early April not manageable -> Needs workaround and announcement!
- FIB integration to timing package
- Timing TC message establishment is high priority

Action items - Readout Firmware

- We need an exact date for firmware v1.1.0 release (from the original 2-3 weeks)
 - Nicely translates and matches the dunedaq release: **15th March ?**
 - Consolidate test benches
 - Automation as an expected result
 - Consolidate top-level projects (ultimate, tpgen, fullchain)
 - Produce a list of outstanding missing features

Action items - Readout Firmware

- **1st of April - v2.0.0 release**
 - dtp firmware blocks integrated with ATLAS FELIX Phase2 firmware
 - Who is going to do this?
 - First realistic DUNE DAQ Readout Firmware release
 - FE format alignment expected? Different builds for WIB, WIB2, (later PD) ?
 - DAPHNE to “slow” FELIX
 - Detailed plan is urgently needed
 - Who is going to do the work?
 - (Dedicated discussions needed now?)
- **(Reminder: 15th May: dunedaq v2.6.0 release:**
 - Readout with multiple FE type support; DAPHNE + WIB2 support)

Action items - Readout Software

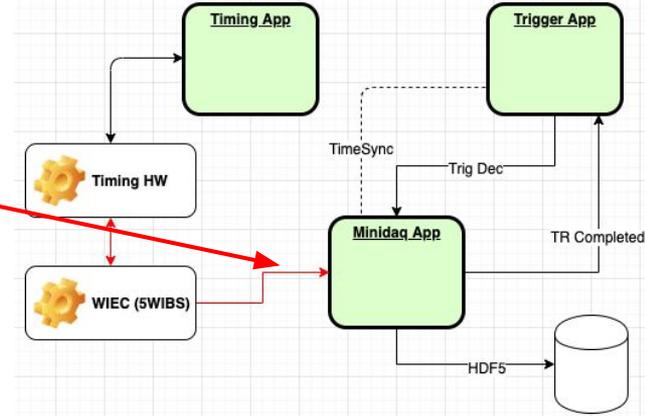
flxlibs

- **v2.4.0 objectives** (in two weeks)

- User and Developer documentations!
- Adapt fake “t0” & TS override from readout
- OpMon structs integration
- Python application configuration generator

- Towards v2.6.0:

- CardController module for CCM interfaces! (Instead of bash scripts!)
 - SLR register configuration needs a proper design if we do this...
- Variable sized user payload handling
 - It's not implemented, but a similar concept is: payload on heap.



Action items - Readout Software

readout

- **v2.4.0 objectives (in two weeks)**

- User + Developer documentations!
- Pending critical BUGs still!
- Fake TP chain needs finalization!
- Other “minor” items

- Towards v2.6.0:

- Data interpretation: “Readout Types” for DAPHNE established
- Propose better raw TP format for firmware (Ivana)
- Implementations for new FE types:
 - DAPHNE -> Latency Buffer, Request Handler, Raw Processor
 - WIB2 -> explore to move to RingBuffer from SPSC queue
- Random crashes and critical bugs are unacceptable -> In production!

<input type="checkbox"/>		RawProcessor attempts to read invalid memory locations	bug	#22 opened on Jan 18 by roland-sipos	DUNE DAQ Rel...
<input type="checkbox"/>		Safe-margin for TPC Fragment data	bug	#15 opened on Jan 14 by roland-sipos	
<input type="checkbox"/>		Extraction limits & TRM crashes	bug invalid	#14 opened on Jan 13 by roland-sipos	
<input type="checkbox"/>		Disable stats threads	enhancement	#49 opened 19 hours ago by glehmannmiotto	
<input type="checkbox"/>		Exercise "Debug streaming" domain	enhancement	#21 opened on Jan 18 by roland-sipos	DUNE DAQ Rel...
<input type="checkbox"/>		Remove excessive DEBUG/INFO statements	enhancement	#16 opened on Jan 14 by roland-sipos	DUNE DAQ Rel...

Integration - Timing

Timing crew works a lot and aids the integration of the timing endpoints in WIB2 at UPenn and ICEBERG.

Deploy “Timing Application” from v2.4.0 release in coordination with DAQ Integration WG

- Generate configuration appropriate for NP04
- User documentation on Timing package Wiki is needed

Integration - Readout

UDAQ aims for the setup of multiple v2.4 release based work areas with FELIX presence in order to provide integration testbeds and to test the readout chain from WIB to FELIX:

- ProtoDUNE-SP servers (Volunteers? -With the help of DAQ Integration?-):
 - np04-srv-028 with 2 FELIX cards, 029 and 030 with single card
 - Setup minidaqapp ONCE on NFS to be useable from all hosts
- Bristol testbed (Shyam)
 - Aids WIB integration
 - Aids TP integration
- EP-DT-DI lab (Roland)
 - Performance analysis and improvements

Discussion