DEEP UNDERGROUND NEUTRINO EXPERIMENT

University of BRISTOL

Upstream DAQ - PD2 Planning

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Towards PD-2

- Software release planning
- Upstream DAQ development
  - Software
  - Firmware
  - Timing
  - Integration
- Tracking document :
  - https://docs.google.com/document/d/1_yGHqB2JWfl5SK4Bk-__MUdA9zpimFbnjYRThYZ-V-8/edit?usp=sharing

dunedaq Release Schedule

- *dunedaq-v2.2.0 - released*
  - *UD : Requested data domain, fake readout module (from file)*
- dunedaq-v2.3.0 (March 1st)
  - SW management updates, externals, CCM, appfwk
- dunedaq-v2.4.0 (March 15th)
  - UD : Readout from FLX, Fake TP readout, Timing

Software Releases

- DAQ Modules
  - Timing: https://github.com/DUNE-DAQ/timing
  - Readout: https://github.com/DUNE-DAQ/readout/
- Base packages
  - Timing HW: https://github.com/DUNE-DAQ/timing-board-software
  - FELIX modules/utils: https://github.com/DUNE-DAQ/flxlibs

Readout/TP Software Development

1. Server config automation - outstanding
2. DUNE FLX distribution - not started (2.3.0 ?)
3. Basic readout app / port of PD-I :
    - 3.1. CardReaderModule - done (2.2.0)
    - 3.2. WIBLinkReader - done (2.2.0)
    - 3.3. RequestsHandler - done (2.2.0)
    - 3.4. LatencyBuffer (WIB) - done (2.2.0 ?)
    - 3.5. TPLinkReader - not started (2.4.0)
4. Overlays
    - 4.1. WIB2 - done, not tested (2.4.0)
    - 4.2. TPG - ? (2.4.0)
    - 4.3. DAPHNE - ? (2.4.0 ?)
5. Readout app functionality
    - 5.1. Latency buffer - ongoing (2.4.0)
    - 5.2. Raw stream - ongoing (2.4.0)
    - 5.3. SNB Store software layer - not started (> 2.4.0)
    - 5.4. TPG readout - not started (2.4.0)
    - 5.5. Data replay from SW buffers - done (2.4.0)
    - 5.6. Data replay from HW buffers - ??? (2.?.?)
    - 5.7. Finalise interface to DS - ??? (> 2.4.0)
6. CCM integration
    - 6.1. Readout - ongoing (2.4.0 ?)
    - 6.2. TPG - ? (> 2.4.0)
    - 6.3. Monitoring - ongoing (2.4.0 ?)

Readout/TP Firmware Development

1. Code review - done (but not documented)
2. Specify TPG requirements for PD-II - ditto
3. Finalise TP FLX output format - ongoing
4. Rebase FW to latest FLX version
   4.1. Phase 1 - done? (but not flx-pie)
   4.2. Phase 2 - started
5. Consolidate existing FW & fix bugs - ongoing
6. Consolidate existing validation code - ongoing (test benches)
7. Implement 4.8Gbps links - done?
8. Implement PD-II TPG algorithm - ?
9. WIB2 data Rx - ongoing
10. Error handling - tbd?
11. Config block - ongoing
12. Production release - target 1/4/21
13. Separate induction/collection wires - after prod release

Need to map the developments to release plan

Firmware Releases

- v1.0.0 - overdue ?
  - Exercise release process
  - FLX phase 1
  - Code consolidation
- v2.0.0 - March 1st ?
  - Production release
  - FLX phase 2
  - WIB2 data Rx
  - TP configuration

Need to discuss FW release process & planning

- *map functionality to releases*
- *code management/standards*
- *test procedure*
- *integration with SW release schedule*

Timing System

1. FIB (hardware)
    1.1. *Fabricate FIB FMC - done*
    1.2. *Basic testing (smoke tests etc) - done*
    1.3. *Implement test FW/scripts - done*
    1.4. *Standalone FIB tests (verify all components) - done ?*

2. MIB (hardware)
    2.1. *Fabricate MIB - out for production - done*
    2.2. Basic testing (smoke tests etc) - underway
    2.3. Implement test FW/scripts - ?
    2.4. Standalone MIB tests (verify all components) - not started

3. GIB (hardware)
    3.1. *Fabricate GIB - done*
    3.2. *Basic testing (smoke tests etc) - done*
    3.3. *Implement test FW/scripts - done*
    3.4. *Standalone GIB tests (verify all components) - done*

6. Firmware
    6.1. *Specify PD-II GIB/MIB/FIB functionality - done*
    6.2. *Implement full functionality FIB FW - done*
    6.3. Test full functionality FIB firmware - underway
    6.4. Implement full functionality MIB FW
    6.5. Test full functionality MIB firmware
    6.6. Implement full functionality GIB FW
    6.7. Test full functionality GIB firmware
    6.8. Specify protocol changes
    6.9. Implement & test protocol changes

7. Software
    7.1. *Design & review C++ library - done*
    7.2. *Skeleton library + appfwk integration - done*
    7.3. *Design & review timing application - done*
    7.4. Implement & test PD-I functionality - underway
    7.5. Implement & test PD-II functionality (FIB only)
    7.6. Implement & test PD-II functionality (full system)

8. Endpoint Support

Integration Plan

1. *Install readout servers at NP04 - done*
2. *Install FLX712 at NP04 - done*
3. Setup test stand at Bristol - partial
4. Integration test FLX + WIB2 (ICEBERG) - ongoing
5. Test Timing sys v0 (NP04) - ongoing
6. Integration test FLX + DAPHNE (NP04) - 1/4/21
7. Integration test FLX + WIB2 (NP04) - 1/3/21
8. Integration test TP FW (NP04) - 1/5/21 (date ?)
9. Install Timing sys v1 (uTCA+FIB) - 1/4/21 (date ?)
10. Test Timing sys v1 - 1/5/21 (date ?)
11. Install MIB, GIB, GPS - 1/8/21 (date ?)
12. Test Timing sys v2 (+MIB, GIB, GPS) - 1/9/21 (date ?)

Need to understand integration schedule ….

Summary

- We have a LOT to do…
- Software release schedule
  - Rough understanding for readout & timing components
  - Planning needed for TPG components
- Firmware release schedule
  - Need to figure out the release process
  - Map functionality to releases
- Integration plan needs to be updated

Will discuss technical details in
UD Technical meetings
Thursday 13:00 UK/14:00 GVA