

A Working DAQ

Eric, Yale

29-May-2014

Outline

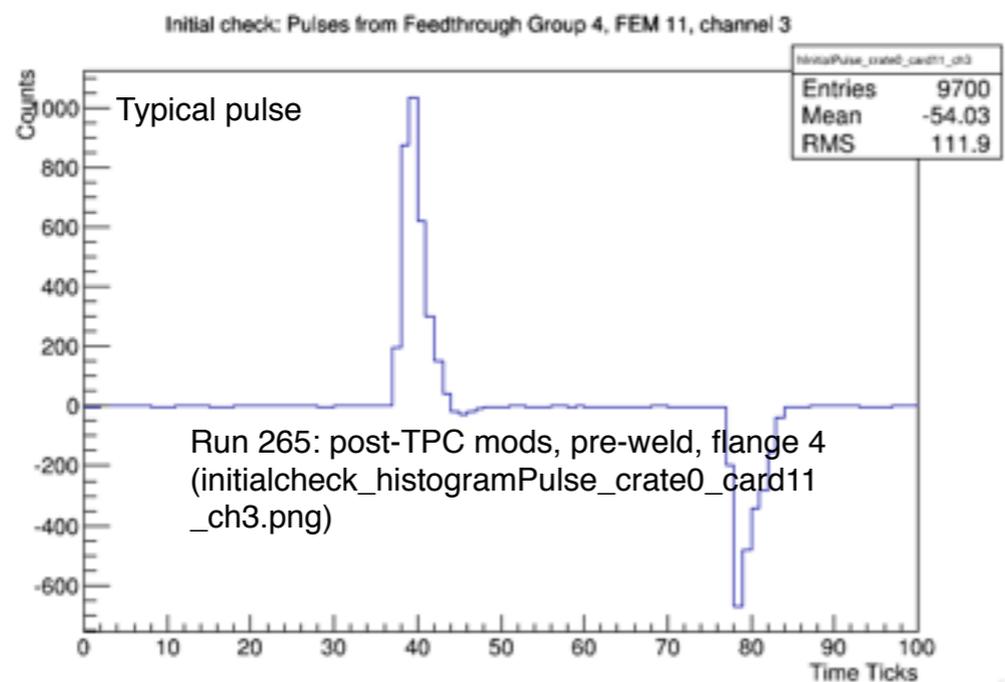
- Electronics testing
 - pre-TPC resistor/varistor changes
 - post-TPC changes
 - post-weld
- DAQ work done
- Work Still needed
- David C's Neutrino2014 poster plot: for rubberstamping

MRT — Electronics Testing: issues

- We bent some pins on the warm SCSI cables at the flange, but we have plenty of spare warm cables
- We made a wholesale swap of the FEMs on DAB test-stand with those on MRT crate. Weird current-draw issue overcome.
 - This had effect of making them all work on both test-stands.
- Flange 4 had a missing insulating stand-off for one of the HDMI cables (used to configure the ASICs).
 - the epoxied plastic piece had fallen from inside of faraday box — probably on initial installation.
 - we glued it back on, reassembled. => ASICs powered up successfully. All is well.

Electronics Testing 2

- Otherwise, all goes quite smoothly now with 2 or 3 of us (Wes, Eric, David C, Yun-Tse) taking about 30–45 min per flange: one working day.
- We post results on the ECL/DAQ page: there is one new half-dead channel to go with the other 2 previously reported. Discovered prior to varistor/resistor installation.
- pre-weld..... (post-weld tests next week!)



~~Insert post-weld waveform here.~~

Delayed until 6-June

Electronics Testing 3

- Cryostat moves to LArTF week of June 23
- We will move the MRT rack to LArTF soon after the platform is in place
 - prepare temporary cable/fiber runs, power, make it work there ...
- June 24 week: platform access
 - MRT rack lowered by crane onto platform and rolled along a smooth platform of some kind laid down on the grating
 - We will repeat our flange-by-flange testing

Level 4 Milestone

- The uB Project is tracking final TPC Assembly, which means a functioning DAQ
- Today the Level 4 milestone for DAQ Commissioning is met.
 - **by fiat**
 - we are currently successfully taking 1 flange at-a-time data
 - **We have a functional DAQ**
 - **Slowmoncon components are mostly in place**
 - That's as much real readout we're able to do till November, obviously

Further Recent Accomplishments

- LArTF is networked, PCIe cards exercised, Online Monitoring working, have established long run times (~30 min), the slowmoncon and DAQ dB server, ubdaq-prod-smc, is functional.
- Run Control is working
- SN mode works in parallel to triggered mode on DAB test stand
 - Yun-Tse making progress understanding and putting together the machinery here.
 - Will build this mode into the larger processing framework, To Be Discussed here later.
- Two test racks, 3 crates, are working at LArTF.
 - Georgia, Kazu, David C have made great progress
 - see Georgia/Kazu's readout talk

But, what do we have and what else do we really need working by end of ~~May~~ August?

- The most essential parts of the DAQ are functional as a system
- We (Gennadiy with input from Eric/Wes) have implemented tweaks to the state machine. Basically to allow for not needing to reconfigure the FEMs for every run, and other features: like a graceful Stop transition, e.g.
- The run control newly allows to fire up and heartbeat and shutdown online_monitor and dispatcher.

SlowMonCon

- All slow monitoring boxes are modified to include suggestions from ORC. Slow monitoring boxes in LArTF computer room are all networked and accessible.
- A new user account called “uboonesmc” is available on LArTF network specifically for users of slow monitoring. Restricted access to users and password protected GUI panels are implemented.
- Wiener Power supply EPICS IOCs are installed and continuously run on the ubdaq-prod-smc machine

Operating the Crate PS's



Example displays for Wiener power supplies at LArTF

Wiener PL508

The screenshot displays two windows from the Wiener GUI. The left window, titled 'Wiener_MainPanel.opi', shows a password field and three crate panels: 'Crate 3' with 'TOP PS' (ON), 'Crate 2' with 'Bottom PS' (OFF), and 'Crate 10' with 'Bottom PS' (OFF). A red arrow points to the 'TOP PS' button with the text 'Click here for expert panel display'. The right window, titled 'WienerGUI_TPCR2_TopPS.opi', shows detailed controls for the top power supply, including a main switch (ON), power supply status (ON), and four channels (CH 01 to CH 04). It also displays a serial number '0287020' and a table of expert control parameters.

Expert Control Parameters				
Min. voltage (V)	4.870	11.700	3.100	4.870
Max. voltage (V)	5.250	12.000	3.470	5.250
OVP (V)	3.250	15.000	4.130	3.250
Max. current (A)	7.500	14.000	60.000	7.500
Const. curr. mode	7.500	14.000	60.000	7.500

There's also a lovely display for the Wiener MPODs — the PS for the ASICS power — not shown.

Slow monitoring update: things done, things to be done at LArTF

Software component	Done	To-do
Power supply OPI panels	Installed, in use	-
Crate status displays	Written, tested	Install, run on ubdaq-prod-smc
IOC for "soft" channels	Beam, power supplies, environment all ready	Run as one IOC on smc
Archiver	Configured, tested, running at KSU	Run on ubdaq-prod-smc
Cryo data scraper	Written, tested, was run on old uboone-ubdaq-smc	Run on ubdaq-prod-smc
Alarm handler	Configured, tested, running at KSU	Run on ubdaq-prod-smc
Documentation for everyone	Notes for login, starting CSS in progress	Put on the control room wiki
Thermal interlock test for power supplies at LArTF	Software Installed and OPI panels available	Start testing soon
CPU hardware monitoring for DAQ computers	Need to work on the lpmi to EPICS approach	

The fuller itemized list

- <https://cdcvs.fnal.gov/redmine/projects/uboonedaq/wiki/TaskRO>
 - is the so-called pre-commissioning list. Meaning that stuff should be checked off by Aug-2014.
 - There are names by the items there.
 - There's been real progress on those items.

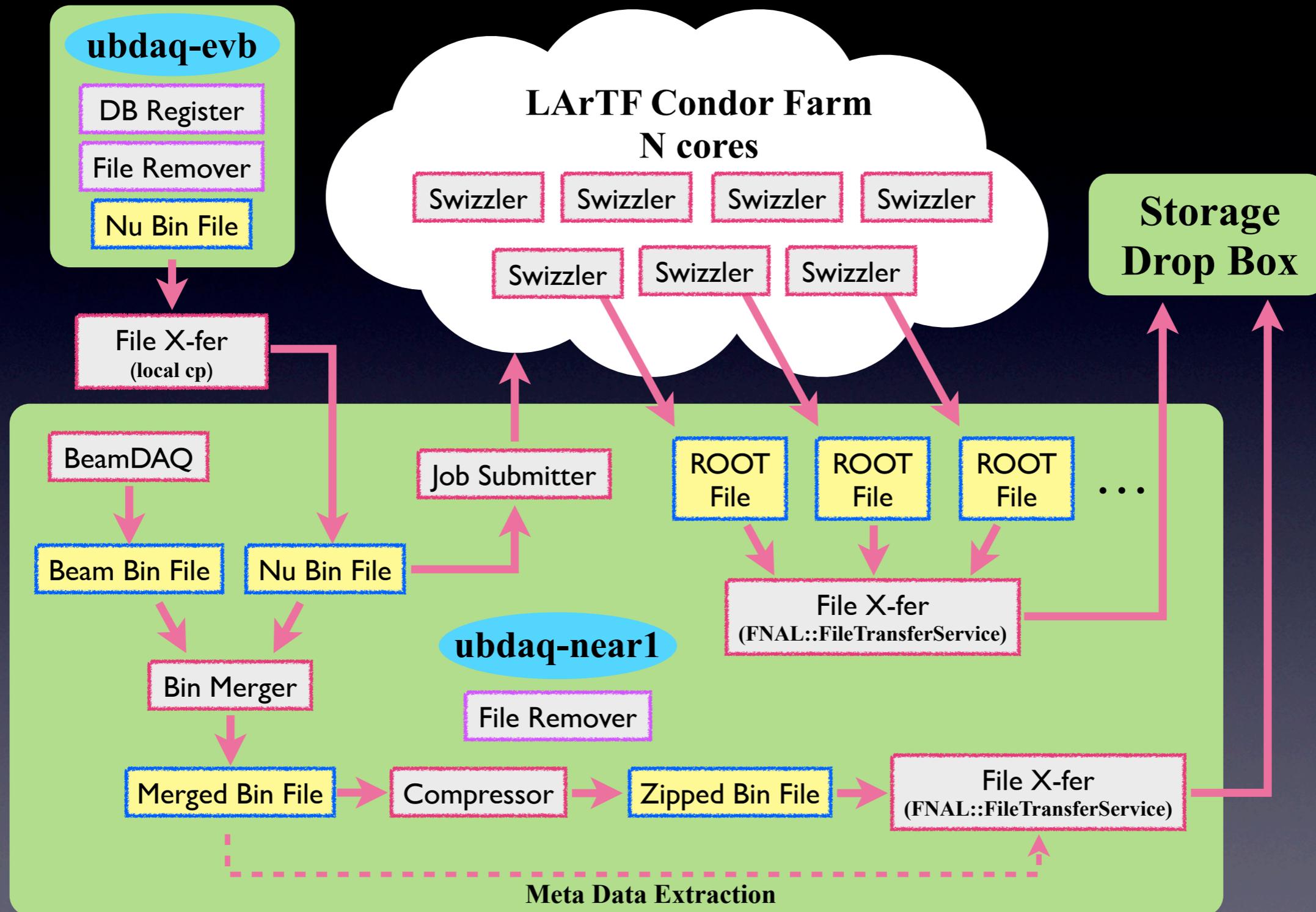
Things needed next

- Still don't have the GPS time collected, in the system. Code is there, ready to use. Antenna almost installed, now it is wiser to wait until people are done on the roof: scheduled with Pete Simon for June-30.
- Compression mode for SN in R&D still. Nice work on a trailing variance method in MC has given good results so far, by David C/Georgia; coding into the FPGAs must follow.

Things we need next 2

- DAQ run configuration dB needs to be in use from the readout code
 - dB and tables are there, python postgres wrapper code is there, we just need to start using and tweaking it.
- We will have our own LArSoft install on `ubdaq-prod-XYZ`, running N instances on our own condor farm.
 - condor is installed, LArSoft isn't yet.
- We need the whole system (using FIFE tools and Double Chooz-derived code) that watches for the raw binaries to appear, and
 - creates metadata, and pushes binary files out to enstore
 - appends beam data
 - sends to swizzling/processing LArSoft jobs
 - pushes those resulting ART ROOT files to enstore
 - Kazu and I have started this discussion
- Laser mode runs need to be coded in

MicroBooNE Online Data Processing



David's Neutrino2014 waveform plot

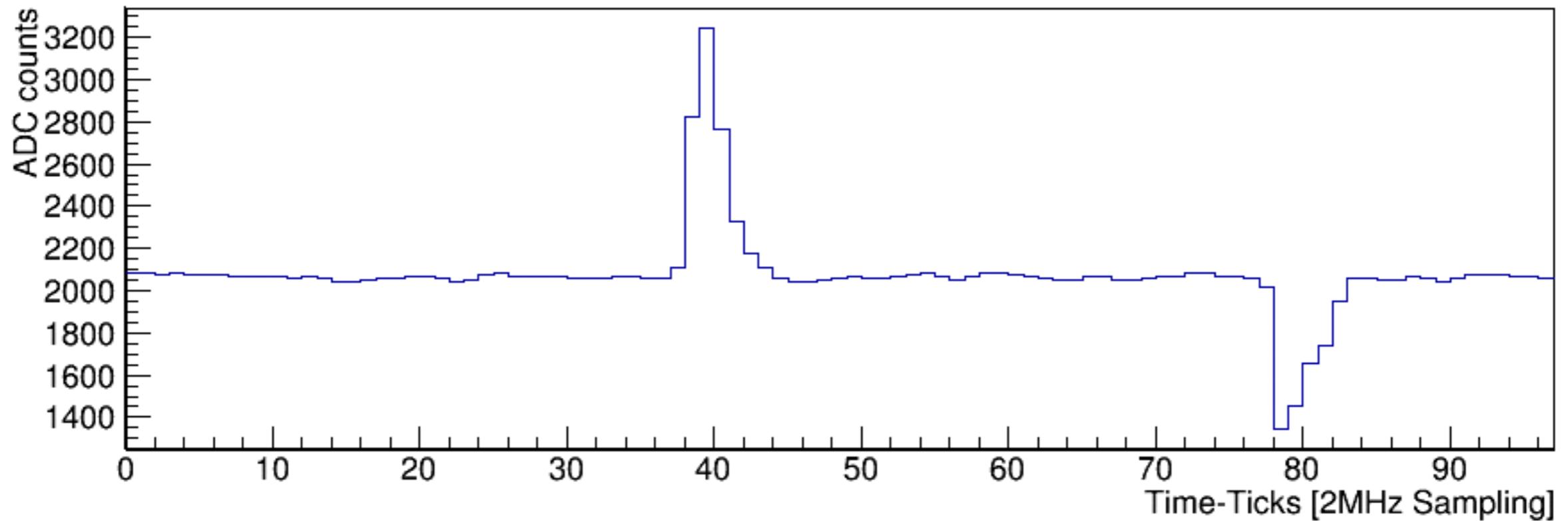


Image of a 50 microsecond waveform recorded during a calibration test of the MicroBooNE Time Projection Chamber electronics.