DUNE Software News and Announcements

Tom Junk

DUNE Software Architecture Meeting

June 9, 2023

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Recent Workshops

- LArSoft Multithreading/Acceleration workshop, March 2-3, 2023
  https://indico.fnal.gov/event/57914/

- Fermilab Frameworks Workshop, June 5-7
  https://indico.fnal.gov/event/59872

- Several interesting and detailed DUNE presentations at both of these

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Status of Services

- jobsub_lite has been undergoing development with exposed changes to users

- SL7 is EOL in June 2024. Next up: Alma Linux 9

- UPS will not be supported on AL9

- I run SL7 in a container on AL9 and it seems to work

- We will have to use Spack at that time; exact timeframe still tbd

- Some feature requests of the Spack developers are pending
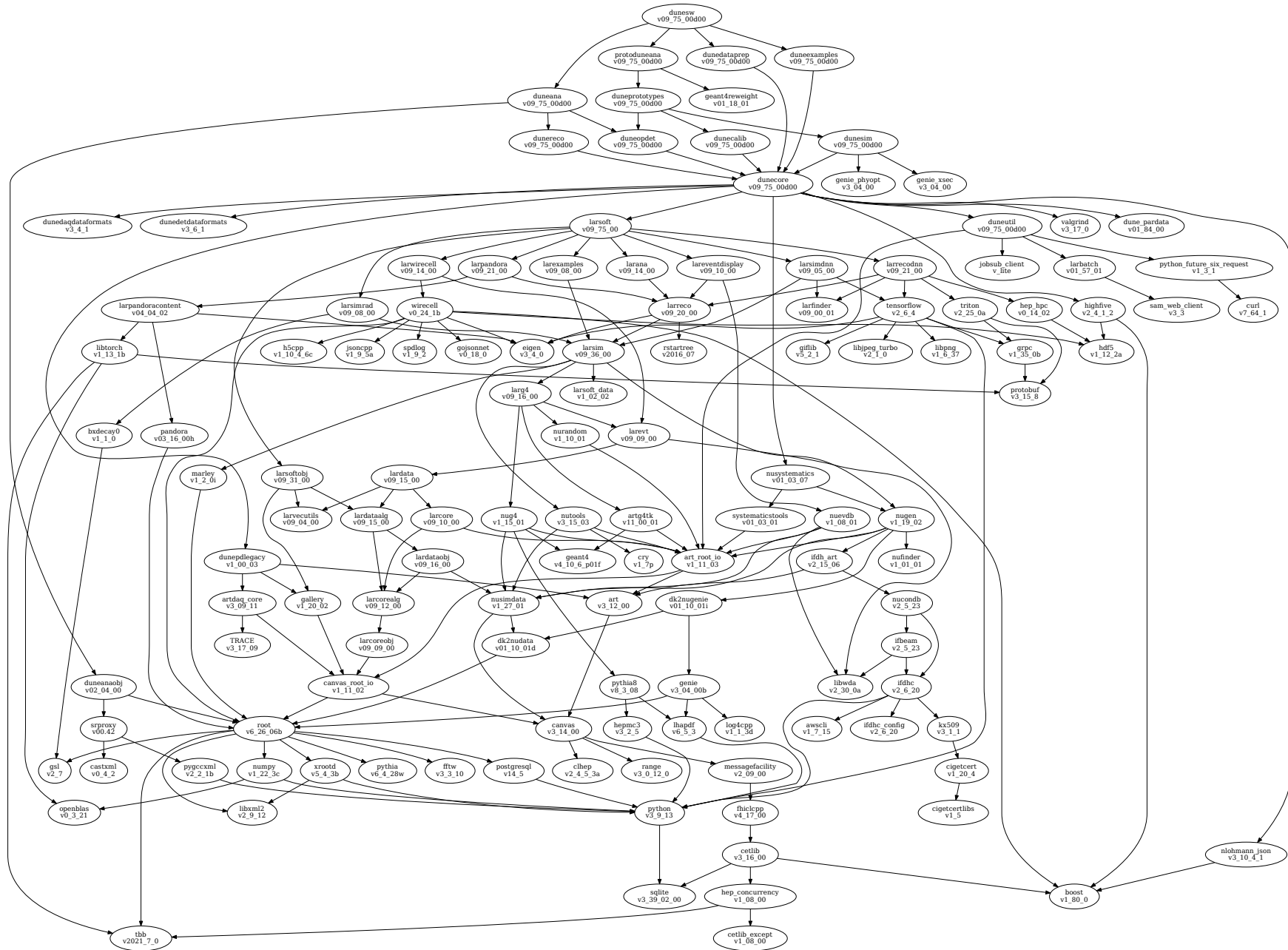
- DUNE DAQ is already usng Spack

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New *art* v3_12_00

- Upgraded from *art* v3_09_04, used in dunesw v09_72_01d00 and earlier.

- LArSoft v09_74_00 was the first release with *art* v3_09_04, but there was a bug in the pythia6 C++ interface.

  - Kudos to Jake who debugged this!

  - And much appreciation for the CI system – GENIE generation integration test failed with a segfault.

  - Cause was common block address exports were missing "extern" – script in the buildshims product was updated by Chris Green

  - ROOT depends on Pythia, so a new ROOT and everything on top of it had to be rebuilt after bug was fixed.

  - So no dunesw v09_74_00*. Bug fixed for v09_75_00d00

- Lots of PRs to remove unnecessary fill_ptr_vector() calls.

- Jake disabled pushes while work is ongoing (I could still push but get a warning message)

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dune_oslibs no longer default

- dune_oslibs provided libraries that were sometimes missing on grid worker nodes but needed for DUNE jobs to run

- Most notably, X11 libraries, but there are a lot of others.

- X11 is needed by GEANT4, even if no graphics are produced by a job.

- Problem is now solved with containers on the grid.

- dune_oslibs was kept around for some users who were missing libraries on their interactive machines and lacked the ability to install them.

- This user base dwindled

- dune_oslibs was setup by the DUNE setup script, and also dunecore depended on it. Both dependencies removed.

- Product kept around as old versions of dunesw depend on it.

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dunesw v09_75_00d00 ups product dependency graph

webevd now owned by DUNE

- Chris Backhouse was the author

- SciSoft was reluctant to support it

- Alex Wilkinson (UCL) says webevd is his event display of choice

- Alex submitted a PR to update it to the new larevt version

- SciSoft preferred for DUNE to manage webevd

- Repo now copied with history to DUNE's github org.

- Copyright assigned to University College London, with the Apache 2.0 open source license.

- This is consistent with UCL's policy:
https://www.ucl.ac.uk/library/learning-teaching-support/ucl-copyright-advice/copyright-research

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webevd maintenance

- Jenkins build script now in duneutil/buildScripts/build-webevd.sh

- Jenkins project build-webevd created

- webevd v09_75_00 tagged with Alex's PR and published

- Still need permission to upload tarballs to the SciSoft web server.

- dunesw doesn't depend on webevd (larsoft never did)

- releases will be done on an as-needed basis

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New Compiler Versions

- Current ones

  - **e20**   GCC v9.3.0, -std=c++17

  - **c7**   Clang v7.0.0, -std=c++17

- New ones

  - **e26**   GCC v12.1.0, -std=c++17

  - **c14**   Clang v14.0.6, -std=c++17

https://cdcvs.fnal.gov/redmine/projects/cet-is-public/wiki/AboutQualifiers

larsoft v09_75_01 has e20, c7, e26 and c14 builds (prof and debug). e26 and c14 builds are for testing/validation, not production.

Sometimes new warnings materialize requring some code fixes.

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SCE Spatial Offset Sign Bug

- See Mike Mooney's talk May 30
  https://indico.fnal.gov/event/59975/contributions/268145/attachments/167532/223567/LArSoft_CoordinationMeeting_23_05_30.pdf

- Inconsistent treatment of signs in SimDriftElectrons (used by the 1D sim) and IonAndScint (used by the 2D sim)

- Meeting on June 7 – proposed cleanup of sign conventions and calls. E-mail from Erica, June 9

  o LArSoft team
    § All of the methods will be documented accordingly in the SpaceCharge.h file, and in each implementation file.
    § The usage of GetPosOffsets will be surveyed. If the TPC is known in all extant cases, then the TPCID will be added as a call argument. If the TPC is not known, then GetPosOffsets will do the work needed to determine the TPC in order to apply the correct offset.
    § The implementation of SimDriftElectrons and IonAndScint will be modified to follow the above convention
  o The experiments
    § The experiments will change their definitions of SCE maps in order to comply with the above convention
    § The experiments will change all relevant reconstruction code in order to comply with the above convention
    § The experiments will be responsible for validating all changes to sim and reco

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dunedaqdataformats and dunedetdataformats

- Header-only copies of dune-daq/daqdataformats and dune-daq/detdataformats

- Now updated to v4_0_0

- What's new:

  - ethernet readout – new WIB frame header file

  - TDE16Frame

  - Many smaller changes – some enums have been expanded.

- Nothing seems to be breaking

  - New data structures in detdataformats are given new names

  - Nothing breaking in daqdataformats – some enums have been renumbered, but for things like nd_gar which are not yet used.

  - daqdataformats headers still sequestered in their own versioned directory in dunedaqdataformats for consistentcy however.

- Need to update code taken from dune-daq/hdf5libs – mostly just enum changes that matter though.

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Trigger data product unpackers from Barnali

- Barnali wrote an unpacker module for trigger primitives, trigger activities and trigger candidates

- Reads HDF5 datasets and writes the corresponding data as persisted maps of sourceID's to C++ classes as data products in the *art*ROOT file

- No reformatting done – classes added to dunecore/duneObj's classes_def.xml and classes.h files

- Module is in https://github.com/DUNE/duneprototypes/blob/develop/duneprototypes/Protodune/hd/RawDecoding/PDHDTriggerReader_module.cc

- gallery example to read the *art*ROOT files in duneexampes/GalleryScripts/trigdump.C

- TTree::Draw() on these seems to hang ROOT

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A Request for a new CVMFS repo

- RITM1757241 from Shekhar Mishra:

Hello, is it possible to get a new CVMFS area for online DUNE AI software:

aionedge.opensciencegrid.org?

Please let me know what info you need.

Dave Dykstra:

Generally OSG requires that repository names include the name of the VO, so for example, dune-ai.opensciencegrid.org.

Shekhar:

I did not make it dune specific as this area will be used by SBND colleagues also.

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dune_pardata Maintenance

- Historically it's been Alex Himmel doing this

- StashCache solves the same problem, but the versioning is different (i.e. you do it yourself with file and directory names – there's no UPS).

- Alex has a separate copy of dune_pardata that he updates and pushes, so patches by non-maintainers to an existing release won't make it into the next one

- Shortly after he became NOvA spokes, Alex told me he still had time to make updates.

- Dom tells me Ken Herner had been maintaining it recently.

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To-Dos

- Look through remaining PRs

  - Dom Brailsford submitted several, needed for upcoming FD Production

- I fixed some problems with Janina's SN Pointing PR – my apologies for being slow with it.

- Update garsoft to *art* v3_12_00

- Spack/cetmodules.   Remove things like find_ups_product() in CMakeLists.txt files. find_package() is not a direct drop-in replacement however (esp. ROOT libraries and I had a problem with gsl)

- HDF5 XRootD static interface

- Coding Guidelines web page

- Doxygen/LXR

- Memory Usage Task Force

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