

Software Maintenance/Refactoring

Jake Calcutt and Tom Junk
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Outline

Brief mention of code management

dunetpc refactoring

Miscellanea

Code Management

David Adams has stepped away from DUNE code management

I've taken over his role for preparing dunetpc releases

- Gavin Davies offered to help, but I've been managing it by myself so far
- Will need to make sure he's up to speed for when I'm unavailable

DUNE also provides Level-2 Management for LArSoft, as do the other experiments using and contributing to LArSoft. Different people with different expertise.

Tingjun Yang, Tom Junk, Alex Himmel, Jake Calcutt, Dom Brailsford

- Duties are to review and approve pull requests.

Dunetpc Refactoring

The main repository for DUNE FD & Prototype code is [dunetpc](#)

- Currently hosted at redmine

Its size has grown quite large over the years

- Slow to check out from git
- Slow to build
 - Especially if you only need one part of the repository (probably the most common use-case)

Tom Junk and I have been working on preparing to split up/refactor the repository into multiple repositories

Some notes on architecture

- The product divisions are meant to speed up, not simplify, the users' interaction with the code checkout and build
- Directory structure in dunetpc was the guide
- Giving each directory its own UPS product would be splitting it a bit too fine
 - Increased maintenance overhead
 - It actually is slower to set up many products than to set up fewer, and your environment gets busier.
 - Some code was better off not being migrated.
- dunetpc has many internal dependencies, so setting up the whole stack is still recommended over setting up smaller portions of it.
- Unique names are still needed through the stack for *art* plugins and fcl files. If we let development diverge by not setting up all of it when building some of it, people will not realize it when they re-use a name.
- We can continue refactoring/splitting code after this. That's what LArSoft did

Dunetpc Refactoring - Splitting Code

Tom started writing some scripts to do the splitting and patching of #include statements and CMakeLists.txt files.

- I added in the functionality to preserve the git history, so a file's history can be tracked from the beginning
 - See [my fork](#) of [his repo](#)
 - Uses [git-filter-repo](#)

```
dunesw$ pwd
/dune/app/users/calcuttj/split_dunetpc_test/new_suite/srcs/dunesw/dunesw
dunesw$ git log -- ../test/ArtServices/test_DetectorProperties.cxx
commit bfe24ed212ee02e0cd0cb1ca10c6d34ab391115f
Author: Kyle Knoepfel <knoepfel@fnal.gov>
Date: Tue May 5 10:15:13 2020 -0500

    Accommodate breaking changes.

commit 00035b5cfe7551300e0af72b1755554439e68305
Author: Kyle Knoepfel <knoepfel@fnal.gov>
Date: Tue Oct 23 16:03:47 2018 -0500

    Upgrade ArtServiceHelper to support art 3.

commit 1813a0849b885af30634332ce0aca22326b110db
Author: Lynn Garren <garren@fnal.gov>
Date: Mon Oct 15 16:48:04 2018 -0500

    EngineCreator.h and getEngine

commit 0665f1a77c40dadb3a7d9d619148ae0f12450fdb
Author: Tingjun Yang <tjyang@fnal.gov>
Date: Mon Apr 17 15:15:08 2017 -0500

    Change dune35t4apa_v5 to dune35t4apa_v6.

commit 9db6b4e5fb36d9891e49996aebb365fdf015a5c5 (feature/mrmooney_SCERecombFeature)
Author: David Adams <dladams@bnl.gov>
Date: Mon Jul 25 09:07:38 2016 -0400

    Add tests of art services in test/ArtServices.
dunesw$ █
```

Dunetpc Refactoring - To-do

1. Send email notifying dune users of plan
 - a. Suggest developers merge/submit pull-requests for feature branches
2. Coordinate with Vito Di Benedetto to set up CI workflow
3. Create new repositories
 - a. To be hosted on [github](#) in the DUNE organization's area
 - b. Github is more public these days than Redmine. Some users have complained read-only Redmine access now requires a Services account.
4. Freeze pushes to dunetpc
5. Run split scripts to create local repos
 - a. Test CI + build
6. Make mrb aware of new repositories in GitHub
7. Request new product directories in the SciSoft web server.

Dunetpc Refactoring - To-do, continued

8. Update Jenkins build script
9. Create ups products
10. [Update | write new] Wiki pages and training materials.
11. Start using GitHub issue tracking instead of Redmine (art migrated all their old issues – may not have to do that, but keep the old issue tracker alive for now).
12. ~~Throw a party~~ Respond to user complaints
13. Check that users have read/write ability for new repositories
14. Start preparing for the next split – automate version number changes

Recent Accomplishments and Progress

- The *art*/LArSoft stack recently migrated to cetbuildtools 8 and mrb 5, and art v3.0.9
- Changes were made under the hood as part of the migration to Spack
- Required maintenance of CMakeLists.txt files and product_deps
- mrb 5 is incompatible with mrb 4 and earlier.
- mrb is set up by default with the setup_dune.script. Need to
unsetup mrb
setup mrb -o
to go back to the earlier version.
- Some repositories, like garsoft, do not get automatic updates from the SciSoft team when things like this happen. But dunetpc is the big one.

Recent Accomplishments and Progress

- Updated `art::event::getByLabel()` calls to `art::event::getHandle()` calls, in advance of deprecation (not scriptable, sadly, and there were about 530 of them)
- Ongoing maintenance of:
 - `garsoft`
 - `dune_raw_data` (moving away from this as its functionality is being replaced by `dunedetdataformats`, `dunedaqdataformats`, and we need to think about channel maps)
 - `dunepdsprce` (remember the RCE's? We have lots of raw ProtoDUNE-SP data with them and need to maintain this forever)
 - `dune_pardata` (Alex Himmel takes care of this one)
 - `edep-sim`
- Lots of other software on DUNE, managed by the respective groups
 - Beam simulations
 - ND-LAr
 - SAND
 - CAFAna

Spack progress

Marc Mengel has been working on this:

<https://cdcv.sfnal.gov/redmine/projects/spack-infrastructure/wiki>

There's a new `ups_to_spack` tool to ease our transition.

Communication with Spack developers helps them become aware of HEP requirements, which are different from general software requirements, but hopefully shared by other fields of science.