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tips and tricks for LArSoft with the new art and build tools

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Overview

- changes related to art 3.09
 - new product stack
 - art breaking changes
 - s112
 - use of mrb 5 and cetbuildtools 8 **required**
- changes related to cetbuildtools 8
 - use target library names when possible
 - e.g., fhiclcpp::fhiclcpp
 - some of these will be required
 - instead of \${MYLIB} use MYLIB
- expect that you will need more find_ups_product calls and more libraries in the link list
- You will need the changes in feature/team_for_art_v3_09

Working with mrb 5 and cetbuildtools 8

- mrb 5 will be the default
 - **required** when building against art 3.09
 - if you need to use mrb 4 for any reason
 - setup mrb -o
- build order matters
 - When using older releases of mrb 5, “mrb uc” step required after mrbsetenv
 - This is now handled automatically when necessary
 - \$MRB_SOURCE/CMakeLists.txt will be rewritten
- You will need feature/team_for_art_v3_09

cetbuildtools 8

- cetbuildtools 8 is a thin wrapper for cetmodules
- required changes to CMakeLists.txt files are minimal
- You will need to use the changes in
 - feature/team_for_art_v3_09
- custom install scripts need a relative destination

```
-install(FILES myfile DESTINATION ${product}/${version}/mydir)
+install(FILES myfile DESTINATION mydir)
```
- eigen headers need to be explicitly included
 - include_directories(\$ENV{EIGEN_INC})
 - DO NOT attempt to include the tensorflow third_party headers
- use ENV properly in find command

```
-cet_find_library(XML2 NAMES xml2 PATHS $ENV{LIBXML2_FQ_DIR}/lib NO_DEFAULT_PATH)
+cet_find_library(XML2 NAMES xml2 PATHS ENV LIBXML2_FQ_DIR PATH_SUFFIXES lib NO_DEFAULT_PATH)
```

gdml files

- This pattern shows up, and is problematic, due to unnecessary custom install instructions

```
add_subdirectory(RefactoredGDMLSchema)
```

```
install_gdml( SUBDIRS GDMLSchema)
```

- Instead, add both directories to install_gdml

```
install_gdml( SUBDIRS GDMLSchema RefactoredGDMLSchema)
```

the curious case of a nonstandard libdir

- If this is NOT a “noarch” product, the generated cmake config files will be in lib/<product name>/cmake
- However, if you redefine libdir in ups/product_deps, the system tries to put the generated config files in that directory.
- Case 1: rename the directory if we can

```
-libdir fq_dir      python
+libdir fq_dir      lib

- pathPrepend(PYTHONPATH, ${UBUTIL_FQ_DIR}/python)
+ pathPrepend(PYTHONPATH, ${UBUTIL_FQ_DIR}/lib)
```

- Case 2: libdir explicitly undefined, but this is not a “noarch” product

```
libdir -
```

- now handled by the latest cetbuildtools 8

Summary

- There will be a script to update library names, but there are other required changes that are not easily scriptable.
- We've done a lot of work
 - code builds
 - Unit and/or CI tests pass
 - install step has no surprises
- We took the opportunity to move argoneut files from lardata to argoneutcode
- YOU WILL NEED feature/team_for_art_v3_09
 - These branches will be updated again to match the official release