

Software Tutorial

Part 1

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Logging in

- Fermilab uses Kerberos for authentication
- Obtain Kerberos ticket with
 - **kinit -f <username>@FNAL.GOV**
- Log into one of DUNE General Purpose Virtual Machines
 - **ssh -X <username>@dunegpvmXX.fnal.gov**
(XX is 01 - 10)
 - Try using different XX from what others are using
- Test X11 forwarding: e.g. type `okular`

Creating Workspace

- Make directory to work in
 - `mkdir -p /dune/app/users/<username>/tutorial-160916`
- Use `/dune/app/users/<username>` for code and other relatively small files, but don't store GBs of data there!

Setting up DUNE Software Environment

- For each new shell run
 - `source /grid/fermiapp/products/dune/setup_dune.sh`
 - To automate add the line above to `~/ .bashrc`
 - Instead you can add it to another script that you run after opening a new shell session

- Here only instructions on using tagged LArSoft version
- Can't edit code
- See Aaron's part of tutorial on how to get your own LArSoft installation that you can modify

Setting up LArSoft

- Check what versions are available
 - `ups list -aK+ dunetpc`
- Set up DUNETPC
 - `setup dunetpc v06_05_00 -q e10:prof`
- This sets up LArSoft and DUNE-specific code

Running LArSoft

- **lar -c configuration.fcl**
- LArSoft is configured with FHiCL (Fermilab Hierarchical Configuration Language) files
- Quite a few files that you can run are available in
\$DUNETPC_DIR/job
- You can copy, modify, and run them

FHiCL Language

- `parameter: value`
- `sequence: [value1, value2, ... valueN]`
- `table:`
 - `{`
 - `parameter1: tableValue1`
 - `parameter2: tableValue2`
 - `...`
 - `parameterM: tableValueM`
 - `@table::someOtherTable`
 - `}`

FHiCL Language

- `#include "fhicl_file.fcl"`
- `tableFromOtherTable: @local::otherTable`
- `outerTable.innerTable.parameter: value`

FHiCL Files

- With `#includes` it gets hard to understand what parameters you actually run
- Some tools exist to help with this
 - e.g. `fhiicl-dump configuration.fcl`
- Example of a configuration file:
 - `/dune/app/users/gvsinev/larsoft_sn/prodsupernova_dune10kt_1x2x6_fullsim.fcl`

Some Other LArSoft Options

- All of these can also be specified in FHiCL file
- `lar -c configuration.fcl`
 - `-n NJobs`
 - `-s inputFile.root`
 - `-o outputFile.root`
 - `-T histogramFile`
- `lar --help`
to see the rest

Monte-Carlo Challenge FHiCL

- Most up-to-date available FHiCL files
- Most probably work
- Good to use as examples for your FHiCL files
- Located in
`$DUNETPC_DIR/source/fcl`