# Setting up your workspace

David Marsden Larsoft Workshop 2022

## Outline

Task 1: Build sbndcode for use in further tasks

Task 2: Make a "test" build and look at more details

- Ask questions at any point
- Don't worry if you get errors
- Ask for help from me or other tutors
- **Everyone** will have built sbndcode at the end of this, we'll do it together

## **Before starting**

Download these slides and have them open (https://indico.ph.ed.ac.uk/event/130/)

The \$ symbol before something indicates an environmental variable (e.g \$MRB\_BUILDDIR), if things haven't been setup correctly, they might not do anything!

I put commands the you need to run in black boxes, e.g.

echo "hello world"

I also include some screenshots of terminal output, so you can check against your own.



## Step 1. Logging in

Click this link: http://py-dom.lancs.ac.uk:8080/guacamole/#/

Enter your username and password which you should have been provided with (shout if not!)

Open up a **terminal** (Applications  $\rightarrow$  System Tools  $\rightarrow$  Terminal)

## Step 2. Make a work directory

cd \$HOME
mkdir larsoft\_workdir
cd larsoft\_workdir

## Step 3. Setup sbndcode using cvfms

source /cvmfs/sbnd.opensciencegrid.org/products/sbnd/setup\_sbnd.sh

Should look like this:

[dune24@py-dom larsoft\_workdir]\$ source /cvmfs/sbnd.opensciencegrid.org/products/sbnd/setup\_sbnd.sh Setting up LArSoft from "CVMFS":

- executing '/cvmfs/larsoft.opensciencegrid.org/setup\_larsoft.sh'

appending '/cvmfs/fermilab.opensciencegrid.org/products/common/db'
 Setting up artdaq from "CVMFS":

appending '/cvmfs/fermilab.opensciencegrid.org/products/artdaq'
 Setting up sbn from "CVMFS":

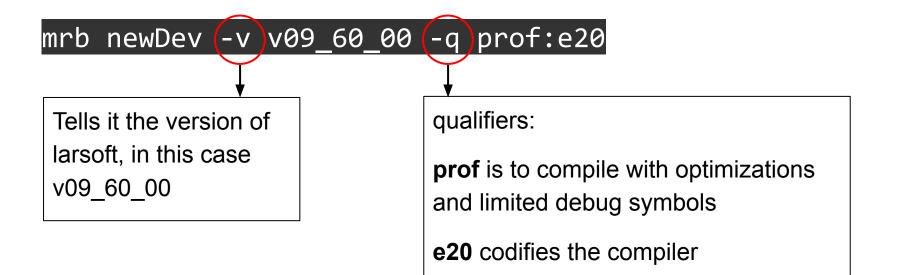
- appending '/cvmfs/sbn.opensciencegrid.org/products/sbn'

Setting up SBND from "CVMFS":

- prepending '/cvmfs/sbnd.opensciencegrid.org/products/sbnd'

[dune24@py-dom larsoft\_workdir]\$

## Step 4. Make a new development area with mrb



## Step 4. Make a new development area with mrb

#### mrb newDev -v v09\_60\_00 -q prof:e20

#### Should look like this:

[dune24@py-dom larsoft\_testdir]\$ mrb newDev -v v09\_60\_00 -q prof:e20

building development area for larsoft v09\_60\_00 -q prof:e20

The following configuration is defined: The top level directory is . The source code directory will be under . The build directory will be under . The local product directory will be under .

MRB\_BUILDDIR is /home/dune24/larsoft\_testdir/build\_slf7.x86\_64
MRB\_SOURCE is /home/dune24/larsoft\_testdir/srcs
INF0: copying /cvmfs/larsoft.opensciencegrid.org/products/larsoft/v09\_60\_00/releaseDB/base\_dependency\_database
/cvmfs/larsoft.opensciencegrid.org/products/mrb/v6\_06\_02/libexec/newDev.sh: line 192: unsetup: command not found

IMPORTANT: You must type source /home/dune24/larsoft\_testdir/localProducts\_larsoft\_v09\_60\_00\_prof\_e20/setup NOW and whenever you log in

## Step 5. Source the local products

As it should have suggested in terminal:

#### source localProducts\_larsoft\_v09\_60\_00\_prof\_e20/setup

#### Should look like this:

[dune24@py-dom larsoft\_testdir]\$ source localProducts\_larsoft\_v09\_60\_00\_prof\_e20/setup

MRB\_PR0JECT=larsoft MRB\_PR0JECT\_VERSION=v09\_60\_00 MRB\_QUALS=prof:e20 MRB\_TOP=/home/dune24/larsoft\_testdir MRB\_SOURCE=/home/dune24/larsoft\_testdir/srcs MRB\_BUILDDIR=/home/dune24/larsoft\_testdir/build\_slf7.x86\_64 MRB\_INSTALL=/home/dune24/larsoft\_testdir/localProducts\_larsoft\_v09\_60\_00\_prof\_e20

PRODUCTS=/home/dune24/larsoft\_testdir/localProducts\_larsoft\_v09\_60\_00\_prof\_e20:/cvmfs/sbnd.opensciencegrid.org/p roducts/sbnd:/cvmfs/larsoft.opensciencegrid.org/products:/cvmfs/larsoft.opensciencegrid.org/packages:/cvmfs/ferm ilab.opensciencegrid.org/products/common/db:/cvmfs/fermilab.opensciencegrid.org/products/artdaq:/cvmfs/sbn.opens ciencegrid.org/products/sbn CETPKG\_INSTALL=/home/dune24/larsoft\_testdir/localProducts\_larsoft\_v09\_60\_00\_prof\_e20

## Step 6. Clone sbndcode



(may need to type yes to connect)

Should take a few seconds then look like this:

```
[dune24@py-dom larsoft_testdir]$ mrb g sbndcode
Cloning into 'sbndcode'...
remote: Enumerating objects: 28691, done.
remote: Counting objects: 100% (771/771), done.
remote: Compressing objects: 100% (363/363), done.
remote: Total 28691 (delta 496), reused 660 (delta 407), pack-reused 27920
Receiving objects: 100% (28691/28691), 76.05 MiB | 22.24 MiB/s, done.
Resolving deltas: 100% (19289/19289), done.
NOTICE: Adding sbndcode to CMakeLists.txt file
[dune24@py-dom larsoft testdir]$
```

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## Step 7. Checkout the feature branch for this workshop

cd \$MRB\_SOURCE/sbndcode

git checkout uk\_larsoft\_workshop\_2022

Should look like this:

[dune24@py-dom sbndcode]\$ git checkout uk\_larsoft\_workshop\_2022 branch 'uk\_larsoft\_workshop\_2022' set up to track 'origin/uk\_larsoft\_workshop\_2022'. Switched to a new branch 'uk\_larsoft\_workshop\_2022' [dune24@py-dom sbndcode]\$

## Step 8. Set environment

#### mrbsetenv - This sets up the development environment

#### -(check for errors)

[dune24@py-dom sbndcode]\$ mrbsetenv The working build directory is /home/dune24/larsoft\_testdir/build\_slf7.x86\_64 The source code directory is /home/dune24/larsoft\_testdir/srcs check this block for errors ...... INFO: mrb v6 06\_02 requires cetmodules >= 2.31.00 to run: attempting to configure...v3 19\_02\_OK To inspect build variable settings, execute /home/dune24/larsoft\_testdir/build\_slf7.x86\_64/cetpkg\_info.sh Please use "buildtool" (or "mrb b") to configure and build MRB project "larsoft", e.g.: buildtool -vTl [-jN]

See "buildtool --usage" (short usage help) or "buildtool -h|--help" (full help) for more details.

## Step 9. Build and install



Wait ~10 minutes and hopefully see no errors

Take a break! Or if you like, you can move on to Task 2 (but don't forget to come back for step 10.)

## Step 10. Setup the local install



This sets up all of the products installed in the localProducts\_.../ directory.

Now this work directory is setup, we can leave it ready for further tutorials!

Make a bash script (no need to install every time!)

#### cd \$HOME/larsoft\_workdir

Copy the bash script to larsoft\_workdir:

cp srcs/sbndcode/sbndcode/Workshop/Setup/setup.sh .

OR you can write it yourself:

vim setup.sh (use emacs etc. if you prefer 😬)

source /cvmfs/sbnd.opensciencegrid.org/products/sbnd/setup\_sbnd.sh
source localProducts\_larsoft\_v09\_60\_00\_prof\_e20/setup
mrbsetenv
mrbslp

## Check the bash script works

Open a new terminal

<mark>cd \$HOME/larsoft\_workdir source</mark> setup.sh

Hopefully see no errors

For later tutorials remember to source this script **every time** you open a new terminal!



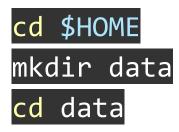
Make a new test directory

Open a **new** terminal

cd \$HOME
mkdir larsoft\_testdir
cd larsoft\_testdir

Repeat previous steps **3 to 10**.

## Make a data directory



When working on the Fermilab gpvms, you should use: /EXPERIMENT\_NAME/data/ directories to store data /EXPERIMENT\_NAME/app/ directories to store code, these have a smaller quota but are backed up.

(There are also *scratch* directories for very large datasets, which get wiped after some time, but not going into that here.)

## Create some events

#### lar -c prodsingle\_sbnd.fcl -n 5 -o muons.root

(make sure you've done mrbslp or sourced a setup script before, or it won't run)

There will be a lot more on creating events like this in further tutorials, so don't worry about it too much here.

But briefly: -c specifies the file to run larsoft over -n specifies the number of events -o specifies the name of the output file

## Extra stuff

## Other useful commands

Look at the versions of code available

ups	list	-aK+	larsoft
ups	list	-aK+	sbndcode

Check active versions of code currently setup in your terminal



## Better way to recompile and run

- If you're modifying code, installing and running, it can get fiddly/time consuming to do the steps to build and run
- Solution: keep two terminals open, one for building and another for running
- Solution: recompile using

#### ninja -C \${MRB\_BUILDDIR} install

(if you're interested please ask another tutor about how ninja works 😃)

## Other resources

- Previous presentations: <u>Iker 2020</u>, <u>Miquel 2022</u>
- Larsoft release documentation:

https://cdcvs.fnal.gov/redmine/projects/larsoft/wiki/LArSoft\_release\_list

- Try search box in <u>LArSoft github</u> to look for specific modules
- mrb <u>reference guide</u>

Good luck, you will get there!