
Instruction for software installation on IOP machine

This note can be found online at <https://www.evernote.com//APOnxDyrHvFKrK-sDqccx24WyWlwcMmhNk8>

IOP machine webpage: <https://www.iop.vast.ac.vn/theor/cluster.php?!=1>

Claim: This note is a draft and will be updated later.

(If you have question, use slack <https://vnnuphys.slack.com> if you are member of neutrino group or send email to cvson@ifirse.icise.vn or nhvan@ifirse.icise.vn)

To login: `ssh -p 7022 your_username@iop1.myftp.org`

- if you want to use root interactively on iop then `ssh -p 7022 -X -Y your_username@iop1.myftp.org`

Platform/OS: `uname -a`

`Linux tcp.cluster 2.6.32-504.el6.x86_64 #1 SMP Wed Oct 15 04:27:16 UTC 2014 x86_64 x86_64 x86_64 GNU/Linux`

- to change password: `passwd`
 - type old pass work → then type new password
- to copy your local file/folder (on your PC) to IOP machine
 - For copy file: `scp -P 7022 your_file_name your_username@iop1.myftp.org:/home/your_username/`
 - For copy folder: `scp -P 7022 r your_folder_name your_username@iop1.myftp.org:/home/your_username/`
- To copy file/folder from IOP machine to your PC
 - To copy file `scp -P 7022 your_username@iop1.myftp.org:/home/your_username/path_to_your_file .`
 - To copy folder `scp -P 7022 -r your_username@iop1.myftp.org:/home/your_username/path_to_your_folder .`
 - (Don't forget . at the end)

All softwares installed below can be found at `cvson@iop1.myftp.org:/home/cvson/soft` (This instruction is on Linux x86_64, might not work with others, but don't hesitate to ask on Slack or send email if you prefer to install on other machine.)

→ **build pythia** (required for ROOT with pythia6 enabled,)

- cp the [build_pythia6.sh](#)



Generic File

(written by

- Robert Hatcher, I modified some path file a little bit)
 - scp -P 7022 [build_pythia6.sh](#) cvson@iop1.myftp.org:/home/cvson/soft/
- /bin/sh [build_pythia6.sh](#) 6412

—> build gsl (required for ROOT with mathmore anbled)

https://root.cern.ch/root/html/MATH_MATHMORE_Index.html

On some platform (like Linux x86_64) GSL needs to be compiled with the option `--with-pic`.

- wget <http://seal.web.cern.ch/seal/MathLibs/gsl-1.8.tar.gz> (this version can work with GLoBES but not with GENIE which require MathMore in ROOT (recommended version is 5.34.36, installation instruction is below))
- tar -xzf gsl-1.8.tar.gz
- cd gsl-1.8
- ./configure --prefix=/home/cvson/soft/gsl-1.8/gsl-bin
- make
- make install

(you can't use this version to enable mathmore in ROOT. When you configure root, you will get something like this)


Checking for GSL version >= 1.10 ... no

Checking whether to build libMathMore ... no

Recommend to use gsl 1.16 <http://ftp.jaist.ac.jp/pub/GNU/gsl/>

- wget <http://ftp.jaist.ac.jp/pub/GNU/gsl/gsl-1.16.tar.gz>
- tar -xzvf gsl-1.16.tar.gz
- ./configure --prefix=/home/cvson/soft/gsl-1.16/gsl-bin
 - if linux 64 bits: `./configure --prefix=/home/cvson/soft/gsl-1.16/gsl-bin --with-pic`
- make
- make install

—>build root

- wget http://root.cern.ch/download/root_v5.34.36.source.tar.gz (this is stable version)
- tar -xzf root_v5.34.36.source.tar.gz
- (to enable mathmore, need gsl higher than 1.10, choose 1.16 version
 - for linux 64 bits, use `--with-pic` when configure gsl (see above instruction for gsl installation))
- cd root
- mkdir /home/cvson/soft/root_buildnew
- /bin/sh [configure_me.sh](#)  Generic File
 - (enable pythia6, mathmore, gsl shared for using GENIE)
 - (enable minuit2 needed to install NUISANCE package later)
- make
- make install
- If success
 - `source bin/thisroot.sh` —> to have executable root

- type root from terminal to check if it work normally. You might need to set the DISPLAY
 - or ssh login with -X -Y option

—>my root version with rebuild with gsl 1.16 and —with-pic in
configure>/home/cvson/soft/root_buildnew/bin/

—>**build globes** —> it's built witt ROOT BEFORE recompile and with older version of GSL

- wget <https://www.mpi-hd.mpg.de/personalhomes/globes/download/globes-3.1.11.tar.gz>
- tar -zxvf globes-3.1.11.tar.gz
- ./configure --prefix=/home/cvson/soft/globes-3.1.11/globes3111_build --with-gsl-prefix=/home/cvson/soft/gsl-1.8/gsl-bin

* After 'make install': *

* Do not forget to add /home/cvson/soft/globes-3.1.11/globes3111_build/bin to your path!

- make
- export PATH=/home/cvson/soft/globes-3.1.11/globes3111_build/bin:\$PATH
- test job
 - cd example:
 - globes -t NFstandard.glb

More globes test job:

- wget <https://www.mpi-hd.mpg.de/personalhomes/globes/documentation/globes-tutorials.tar.gz>
- tar -zxvf globes-tutorials.tar.gz
- edit Makefile to point to your \$GLOBES installation
- make th13delta or just make

./th13delta: error while loading shared libraries: libgsl.so.0: cannot open shared object file: No such file or directory

—>fix by runnining export LD_LIBRARY_PATH=/home/cvson/soft/gsl-1.8/gsl-bin/lib:\$LD_LIBRARY_PATH

- run ./th13delta —> produce th13delta.dat
- plot with gnuplot ./th13delta.gnuplot

—> **LHAPDF for GENIE**

- wget <http://www.hepforge.org/archive/lhapdf/lhapdf-5.9.1.tar.gz>
- tar -zxvf lhpdf-5.9.1.tar.gz

- mkdir lhpdf591_build
- cd lhpdf-5.9.1
- ./configure --prefix=/home/cvson/soft/lhpdf591_build
- make
- make install

—>log4cpp for GENIE

- download here <https://sourceforge.net/projects/log4cpp/> (version 1.1.3)
- mkdir /home/cvson/soft/log4cpp_build
- ./configure --prefix=/home/cvson/soft/log4cpp_build
- make
- make install

—> buid Libxml2 for GENIE


- download libxml2-2.9.1 <https://www.dropbox.com/s/q4utul6p4ebam84/libxml2-2.9.1.tar.gz?dl=0>
- mkdir /home/cvson/soft/libxml_build
- cd libxml2-2.9.1
- ./configure --prefix=/home/cvson/soft/libxml_build
- make
- —>missing python but seem no problem


libxml.c:14:20: error: Python.h: No such file or directory

—> build GENIE

This is a universal neutrino event generators which used widely in neutrino experiments, especially in US and EUROPE(!?). It's open source and you can get it free.

(To run GENIE after install: (1) cd /home/cvson/soft/genie —> (2) source genie_env_r212.sh —> (3) cd R-2_12_2/bin)

- To get source files
 - svn co http://genie.hepforge.org/svn/generator/branches/R-2_12_2 R-2_12_2 —> compiled successfully. This is new version but not sure how much they tested, not used officially in neutrino experiments yet
 - svn co http://genie.hepforge.org/svn/generator/branches/R-2_8_2 R-2_8_2 —> not compiled yet. This version is quite old, but still used officially in neutrino experiments
- cd genie/
- source [genie_env_r212.sh](#)  Generic File
- cd R-2_12_2/ (here to install R-2_12_2 version, but it should be similar for R-2_8_2 —> to be confirmed)

- /bin/sh [configure_me.sh](#)  Generic File (please be careful to use right configure file. We are having two files with same configure_me.sh in this note, unfortunately.)
- make
- make install
- test some jobs in /home/cvson/soft/genie/R-2_12_2/bin
 - gmksp1 -p 14 -t 1000080160 -n 150 -e 20 --event-generator-list CCQE
 - this to make cross section file for charge current quasi elastic (CCQE) interaction between muon neutrino (p 14) with H2O (t 1000080160) at 150 points of energy from 0 to 20GeV (uniformly) →takes time to run, depending the network, you can reduce the time
 - this will produce a xsec_splines.xml file
 - ./gevgen -n 1000 -p 14 -t 1000080160 -e 1,5 --event-generator-list CCQE --cross-sections xsec_splines.xml
 - This is to simulate 1000 interactions of muon neutrino (p 14) with H2O (t 1000080160) with energy from 1-5 GeV for the charged current quasi elastic interactions with the above generated cross section file
 - the output is a root file and a log file tagged with “.status” at the end

Next steps

build nuisance

- webpage <https://nuisance.hepforge.org>
- This platform is to compare between the neutrino event generator with the real experiment

build cernlib?

- This is required to build NEUT (see below)

build NEUT

- This is another neutrino event generator used mainly in Japan accelerated-based neutrino experiments

Check job submitting

- You should use cluster to submit the job, it should be more convenient than running interactively from your terminal

→ should make account for Le, Ngoc, Truong?

→ we might ask an account/ or `disk` with

larger storage? to share among group members.