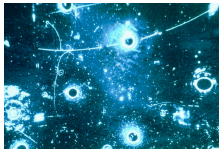
DEEP UNDERGROUND NEUTRINO EXPERIMENT



http://cern.ch/cenf

CERN

ProtoDUNE Science Workshop

Neutrino Computing Cluster at CERN

Nektarios Benekos (CERN),
Theodoros Giannakopoulos (UoP), Christos Lezos (UoP)

https://twiki.cern.ch/twiki/bin/view/CENF/NeutrinoClusterCERN

First Step

First step: login to CERN linux node username and password

- **Open a terminal, and secure shell login to lxplus node**
  - **ssh –Y –l <username> lxplus.cern.ch**
  - **Enter password when prompted**
  - **Secure shell login to neutplatform**
  - **ssh –Y neutplatform**
  - **To access your space:**
    - **cd /mnt/nas00/users/<username>**

https://twiki.cern.ch/twiki/bin/view/CENF/NeutrinoClusterCERN - Connect_to_Neutrino_Cluster

Our System(1/4)

- **Thanks to Marzio**, we have 55 servers (for the time being) in our disposal
  - approximately 300 on the way + 20 racks
  - All will be installed at Bld. 185
  - Power and Network infrastructure under investigation.
    - It is foreseen for a fast connection 20Gbps connectivity to the CERN Tier-0 / EOS data storage space.

- We have a computing cluster at CERN and we have set up a DNS with domain name *neutplatform.cern.ch*

- It is accessible from the CENF-Computing e-group members
  - https://twiki.cern.ch/twiki/bin/view/CENF/HowToGetAccess
  - The only restriction: to be CERN-registered/have an account

- On every server the software that has been installed is CERN Centos 7.
  - Could be a perfect test bed for this OS

- Priorities (TBD)
  - Data Handling/MC production/processing/challenges
  - DAQ
  - Data Quality monitoring prompt processing

https://twiki.cern.ch/twiki/bin/view/CENF/DUNEProtSPHComputing

Our System(2/4)

- All servers are connected to a QNAP TS-1253U with 48TB space and has the following volumes:
  - Users
  - Scratch (place that everyone can have some files temporarily)
  - Software (contains all DUNE/LArSoft versions that are available)
  - MC Data

- https://twiki.cern.ch/twiki/bin/view/CENF/NeutrinoClusterCERN#Storage

More information about the system and related tasks one can found here
(Talk at DUNE S&C 6June)

Our System(3/4)

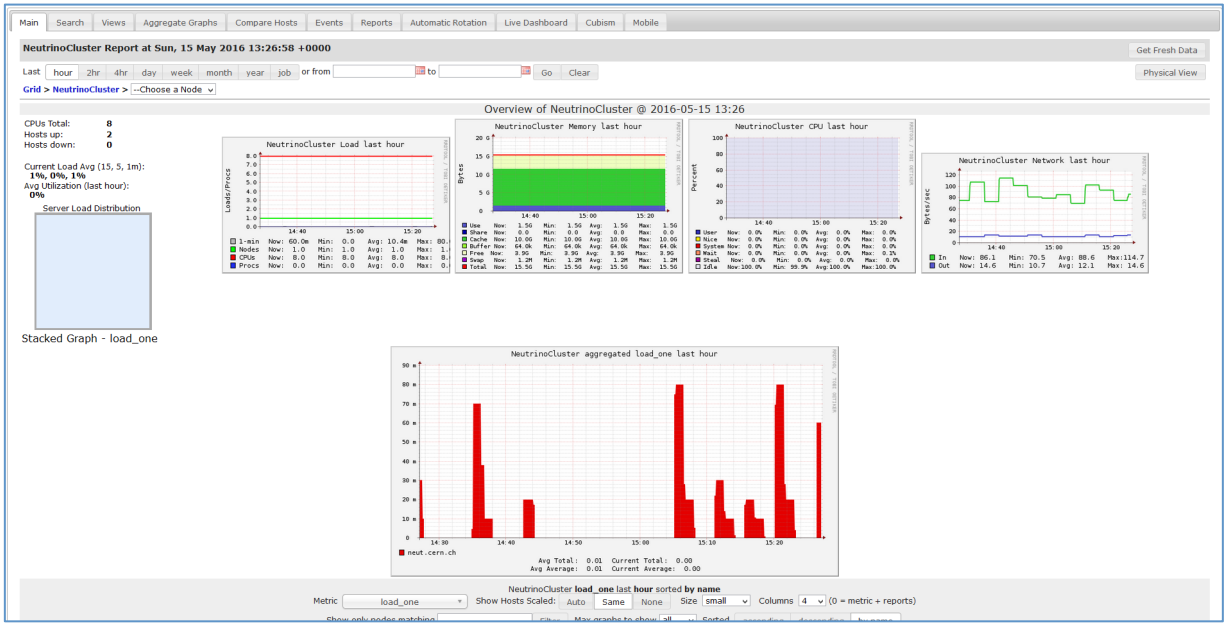
- Another storage source available for CENF relies now on EOS (for disk space only)
- /eos/neutplatform
- //eospublic//eos/neutplatform/
- xrootd is used and works with EOS technology

- We have developed quota note visualization tool
- http://eoscockpit-quota.cern.ch/quotas/eospublic/eos/neutplatform.html
- Currently available space : 200TB with possibility to 400 TB.

https://twiki.cern.ch/twiki/bin/view/CENF/CENFStorageAtCERN

Our System(4/4)

The cluster was made with HTCondor and also we have set up ganglia to monitor the performance on the cluster



Ganglia overview

More information can be found at our twiki links:

- https://twiki.cern.ch/twiki/bin/view/CENF/WebHome
- https://twiki.cern.ch/twiki/bin/view/CENF/Computing
- https://twiki.cern.ch/twiki/bin/view/CENF/NeutrinoClusterCERN

We are trying to update them as often as possible!

DUNE Software@neutplatform cluster (1/2)

- All versions of DUNE can be found at http://scisoft.fnal.gov/scisoft/bundles/dune/
- Each version can be download with the help of pullProducts, that can be found at http://scisoft.fnal.gov/scisoft/bundles/tools/pullProducts
- Note that when someone downloads the pullProducts script needs to give execute permissions(x) e.g At CERN Centos 7:
  - chmod +x ./pullProducts
- After that you can download the version of DUNE you want
  - ./pullProducts <product-directory> slf7 dune-vXX_YY_ZZ e9 <prof|debug>
    - About qualifiers:
      - https://cdcvs.fnal.gov/redmine/projects/cet-is-public/wiki/AboutQualifiers

DUNE Software@neutplatform cluster (2/2)

- DUNE software is produced for slf7 from version v05_13_00 and after. This means older versions of DUNE does not support slf7

- If someone wants to use an older version of LArSoft or any other software he must download it manually and set it up

DUNE/LArSoft releases at NEUTRINO Cluster

- If someone **does not want to** download the DUNE software latest versions of DUNE can be found at:
  - /mnt/nas00/software/
- More information can be found at
  - https://twiki.cern.ch/twiki/bin/view/CENF/NeutrinoClusterCERN
  - https://twiki.cern.ch/twiki/bin/view/CENF/DUNESoftNeutrinoCluster
  - https://twiki.cern.ch/twiki/bin/view/CENF/LArSoftNeutrinoCluster

Setting up your environment(1/4)

- Set up the ups for DUNE:
  - source /mnt/nas00/software/dune-v05_13_00/setup
  - To list the available versions of a product and qualifiers
    - ups list –aK+ <product-name> or
    - ups list –aK+ <product-name> <version>
  - To verify that all dependencies are available:
    - ups depend <product-name> <version> -q <qualifiers>

mrb Reference Guide
Environment
Commands
- newDev (n)
- gitCheckout (g)
- svnCheckout (svn)
- build (b)
- install (i)
- test (t)
- zapBuild (z)
- newProduct (p)
- changelog (c)
- updateDepsCM (uc)
- updateDepsPV (uv)
- makeDeps (md)
- checkDeps (cd)
- pullDeps (pd)

Aliases
- mrbsetenv
- mrbslp

https://twiki.cern.ch/twiki/bin/view/CENF/DUNESoftNeutrinoCluster

Setting up your environment(2/4)

- Set up the basic tools and variables that are needed:
  - Setup git
  - Setup gitflow
  - setup mrb
    - mrb –h → lists available commands
    - mrb command –h provides more information for each command
  - Define MRB_PROJECT → export MRB_PROJECT=larsoft

- Setup your working space by making a directory
- mkdir DuneSwTutorialTest
- cd DuneSwTutorialTest
- At this point, we need to make a directory for this larsoft release
  - mkdir dune_vXX_YY_ZZ
  - cd dune_vXX_YY_ZZ

https://twiki.cern.ch/twiki/bin/view/CENF/DUNESoftNeutrinoCluster

Setting up your environment(3/4)

- Create a new installation of larsoft (building development area) specifying version and qualifiers
  - mrb newDev –v vXX_YY_ZZ -q e9:prof
    - newDev→Start a new development area (by creating srcs, build, and products directories)

- **IMPORTANT** the step above generates a setup that you must type (now and whenever you log in):
  - source localProducts_larsoft_vXX_YY_ZZ_e9_prof/setup
- You will now see a directory called srcs (sources - where the code is kept). Move to this directory and check out the code packages you want
  - cd srcs
  - mrb g –t dune_v05_13_00 dunetpc
  - mrb g –t dune_v05_13_00 larsim

You may checkout a branch or tag:

mrb g –b <branch> <package> #(development version)
mrb g –t <tag> <package> #(frozen version)
mrb g –t LARSOFT_SUITE_<version> <package>

Setting up your environment(4/4)

- Build your release and tell larsoft to use your locally built libraries:
- cd ../
- cd $MRB_BUILDDIR
- mrbsetenv → # Setup a development environment. This is an alias for "source $MRB_DIR/bin/mrbSetEnv”
- mrb I –j4 (i - install, j4 - use 4 cpus in parallel)
- cd ..
- mrbslp→Setup all products installed in the working localProducts_XXX directory. This is an alias for "source $MRB_DIR/bin/setup_local_products”
- Or use the following script:
  - https://twiki.cern.ch/twiki/bin/view/CENF/DUNESoftNeutrinoCluster#Setting_up_your_enviroment_using

Every time you log-in (fresh login)

- Every time a user logs in and wants to use the working space that he has created, he must type:
  - source /mnt/nas00/software/dune-v05_13_00/setup
  - setup mrb
  - source<localProdDir>/ localProducts_larsoft_vXX_YY_ZZ_e9_prof/ setup
  - Mrbslp
- Or use the following script:

  https://twiki.cern.ch/twiki/bin/view/CENF/DUNESoftNeutrinoCluster#Every_time_you_login_using_scrip