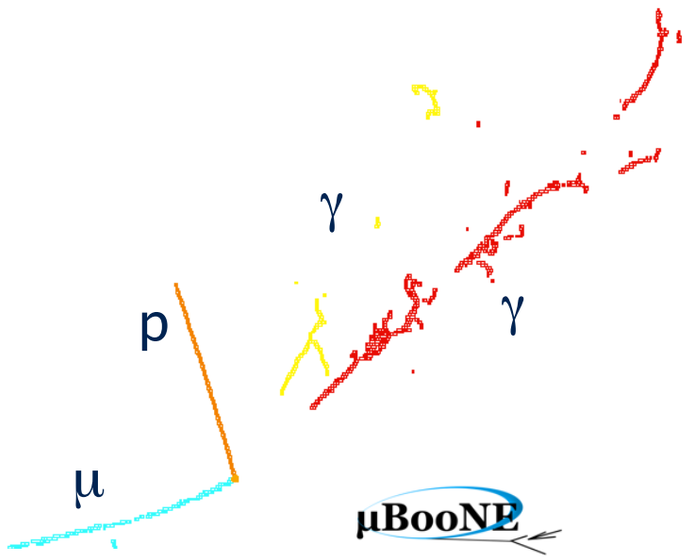


Using the Managed Cluster Service

J. S. Marshall for the Pandora Team

MicroBooNE Pandora Workshop

July 11-14th 2016, Cambridge

Computing Options

- **Attendees of workshop will receive temporary accounts allowing use of:**
  - MCS machines in the main room hosting the workshop: Ubuntu 14.04.4 LTS
  - Cambridge HEP group resources: SLC6 with CVMFS access to LArSoft releases

- **The workshop includes two exercises using Pandora in LArSoft (inputs and outputs), plus seven exercises best tackled in the Pandora standalone development environment.**
- It is suggested that you use local installations of ROOT and Pandora on the MCS machines for the main Pandora algorithm-development exercises.
- For the LArSoft exercises, it is suggested that you use the MCS machines to access the Cambridge HEP group computing resources.

Computing Options

- Could use Fermilab computing resources for LArSoft exercises, but X11 forwarding of Pandora visualisation (optional part of Exercise 1) will be unbearably slow.
- Could use your own laptop for any of the exercises, and setting-up the Pandora standalone environment should be quite simple:
  - Just need ROOT installation (including TEVE visualisation) and compiler supporting C++11 standard
  - Exercises prepared using OSX El Capitan, 10.11.5, Apple LLVM 7.0.2 (clang-700.1.81), ROOT 5.34.32

MCS machines for Pandora standalone (plus Cambridge HEP for LArSoft) probably the fastest way to get set up and start developing Pandora algorithms!

MCS Linux

You will usually find that a PC in a MCS room is already switched on, and displaying a Windows information/ start screen. If the screen is blank, move the mouse to wake the display. If the machine is switched off, switch it on and go to step 2, below.

1 Hold down the Ctrl and Alt keys while pressing Delete. A warning message about use of the system is displayed; click on OK. At the Windows login screen click on the triangle at the right-hand side of the the red icon at the bottom right of the screen and, from the pull-down menu, select Restart

2 After some preliminary checks, the system will ask you to select the operating system to start; use the down arrow key to highlight MCS Linux and then press Enter ↵ to confirm your choice. If you wait too long to make your selection, the system will start the default operating system, which for most machines is Windows.

3 A splash screen appears and the system continues to boot into Linux. If the system has to update itself this may take some time, and it may reboot.

4 A dialog box is displayed, asking for your username. Enter your user id then press Enter ↵.

5 A dialog box is displayed, asking for your password. Enter your password then press Enter ↵.

6 Your desktop will then load. A window containing the Message of the Day will appear, after the window manager has completely started, the launcher and a menu bar appear.

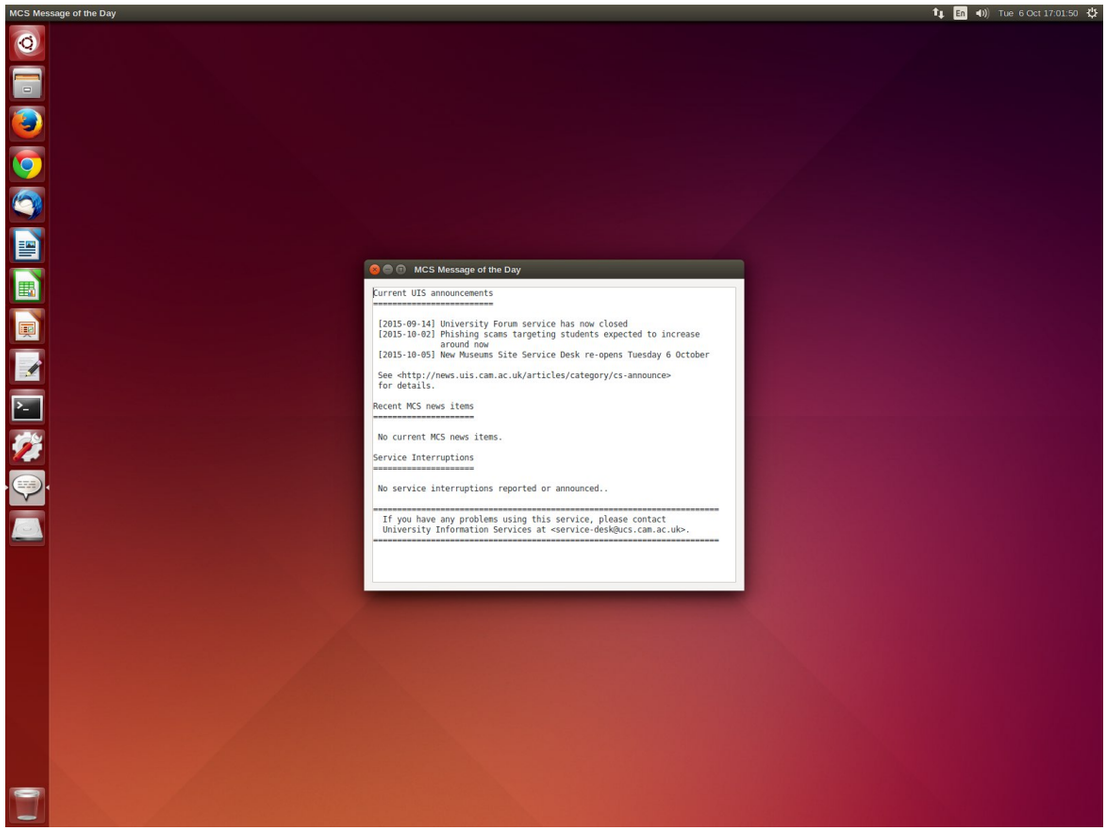
MCS Linux is based on Ubuntu and uses the Unity interface to the GNOME desktop environment.

See http://www.ucs.cam.ac.uk/desktop-services/mcs/basiclinux#section-1

MCS Linux

MCS Linux login screen

MCS Linux desktop



See http://www.ucs.cam.ac.uk/desktop-services/mcs/basiclinux#section-1

Installing ROOT

- **Only remaining pre-requisite for getting started with the Pandora standalone environment**
  - gcc 4.8.4 and cmake 2.8.12.2 already available on MCS machines

https://root.cern.ch/content/release-53432

Release 5.34/32 - 2015-06-23 | ROOT a Data analysis Framework

Home

Release 5.34/32 - 2015-06-23

Release Notes

The release notes for this release can be found here

Source distributions

Platform	Files	Size
source	root_v5.34.32.source.tar.gz	72M

Binary distributions

Platform	Files	Size
CentOS Cern 7 gcc4.8	root_v5.34.32.Linux-cc7-x86_64-gcc4.8.tar.gz	71M
CentOS Cern 7 gcc4.9	root_v5.34.32.Linux-cc7-x86_64-gcc4.9.tar.gz	72M
Linux fedora20 gcc4.8	root_v5.34.32.Linux-fedora20-x86_64-gcc4.8.tar.gz	57M
Scientific Linux Cern 6 gcc4.4	root_v5.34.32.Linux-slc6-x86_64-gcc4.4.tar.gz	69M
Scientific Linux Cern 6 gcc4.7	root_v5.34.32.Linux-slc6-x86_64-gcc4.7.tar.gz	71M
Scientific Linux Cern 6 gcc4.8	root_v5.34.32.Linux-slc6-x86_64-gcc4.8.tar.gz	71M
Scientific Linux Cern 6 gcc4.9	root_v5.34.32.Linux-slc6-x86_64-gcc4.9.tar.gz	72M
Ubuntu 12 gcc4.6	root_v5.34.32.Linux-ubuntu12-x86_64-gcc4.6.tar.gz	57M
Ubuntu 14 gcc4.8	root_v5.34.32.Linux-ubuntu14-x86_64-gcc4.8.tar.gz	62M

For use with MCS machines

Installing ROOT

```
export MY_TEST_AREA=/path/to/your/test/area
cd $MY_TEST_AREA

wget https://root.cern.ch/download/root_v5.34.32.Linux-ubuntu14-x86_64-gcc4.8.tar.gz

tar -xvzf root_v5.34.32.Linux-ubuntu14-x86_64-gcc4.8.tar.gz

source $MY_TEST_AREA/root/bin/thisroot.sh
```

```
# To (locally) resolve ROOT font-corruption issues on this platform, can make a small edit:

nano $MY_TEST_AREA/root/etc/system.rootrc
```

```
# GUI style: modern (flat popup menus), modern-flat (flat frames), or classic (win 95 style)
Gui.Style:                  modern-flat
Gui.DefaultFont:            -*-helvetica-medium-r-*-*-12-*-*-*-*-*-iso8859-1
Gui.MenuFont:               -*-helvetica-medium-r-*-*-12-*-*-*-*-*-iso8859-1
Gui.MenuHiFont:             -*-helvetica-bold-r-*-*-12-*-*-*-*-*-iso8859-1
Gui.DocFixedFont:           -*-courier-medium-r-*-*-12-*-*-*-*-*-iso8859-1
Gui.DocPropFont:            -*-helvetica-medium-r-*-*-12-*-*-*-*-*-iso8859-1
Gui.IconFont:               -*-helvetica-medium-r-*-*-10-*-*-*-*-*-iso8859-1
Gui.StatusFont:             -*-helvetica-medium-r-*-*-10-*-*-*-*-*-iso8859-1
Gui.BackgroundColor:         #e8e8e8
Gui.ForegroundColor:         black
```

Change Gui.IconFont size to e.g. 12

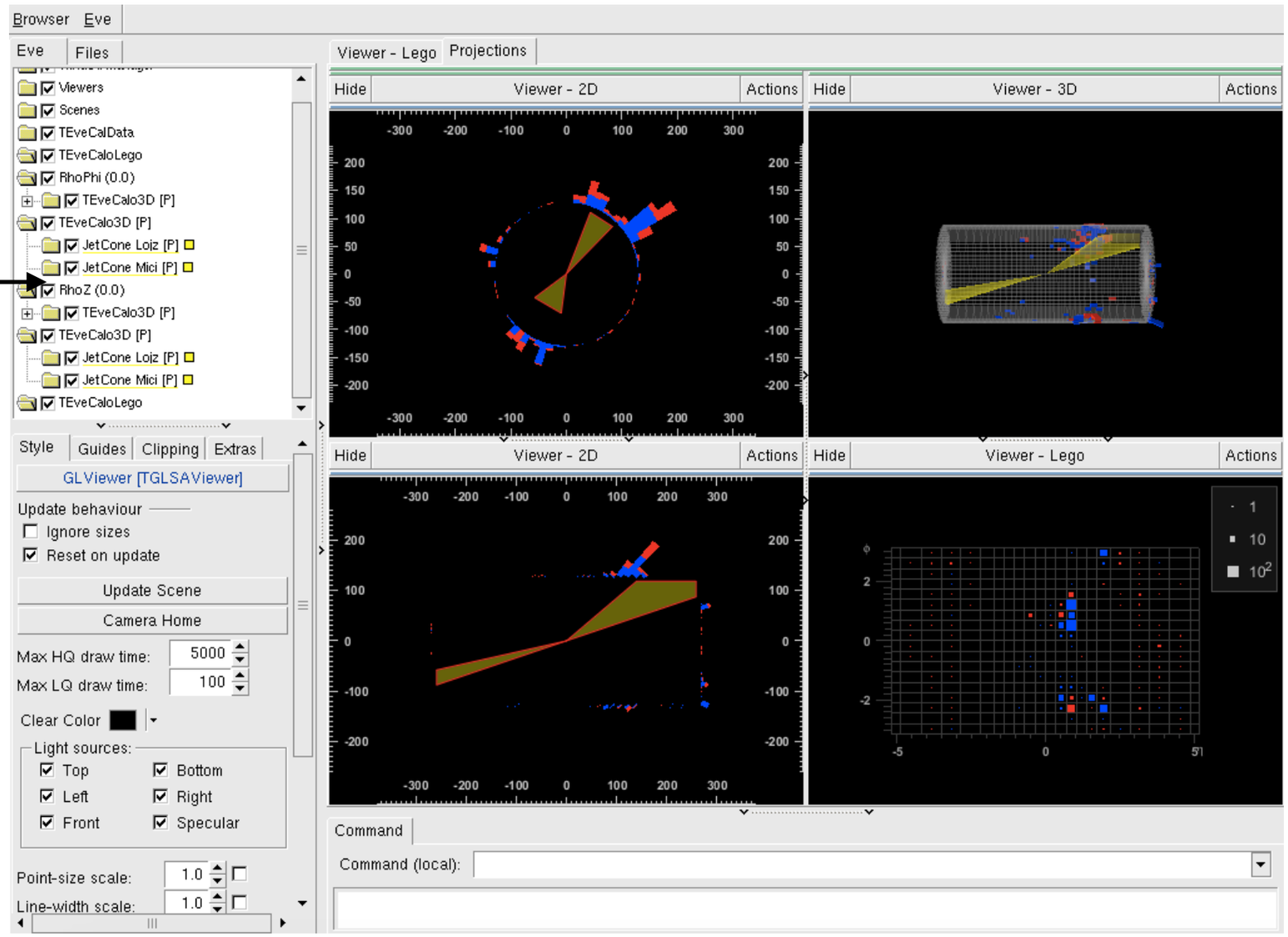
Change from 10 to 12, then save

Installing ROOT

```
# Test functionality via

root $MY_TEST_AREA/root/tutorials/eve/calorimeters.C
```

Font distortion here, unless address as on previous slide (or similar)



Now ready to start Exercise 2, working in Pandora standalone environment

Running LArSoft

- **Can use MCS machines purely as a terminal to access remote computing resources.**
- **Easier than trying to install LArSoft on these machines, with limited permissions, etc.**

- **Recommend that you use your separate account for the Cambridge HEP systems.**
  - Access LArSoft installations published to CVMFS.
  - After sourcing a setup script, everything should look just like it does at Fermilab.

- **Could alternatively access Fermilab systems e.g. uboonegpvm0X.fnal.gov**
  - Should be fine for jobs running in the terminal, but X11 forwarding unbearably slow.
  - Works (in principle), but basically unusable if you try to forward an event display.

Running LArSoft

Allocated individually

To use Cambridge HEP resources

```
ssh -XY username@machinename.hep.phy.cam.ac.uk

source /cvmfs/uboone.opensciencegrid.org/products/setup_uboone.sh
setup uboonecode v05_13_00 -q e9:prof

lar -h
```

```
Usage: lar <-c <config-file>> <other-options> [<source-file>]+

Allowed options:
  -c [ --config ] arg                   Configuration file.
  -h [ --help ]                         produce help message
  --process-name arg                    art process name.
  --print-available arg                 List all available plugins with the
                                        provided suffix.  Choose from:
                                            'module'
                                            'plugin'
                                            'service'
                                            'source'
  --print-available-modules             List all available modules that can be
                                        invoked in a FHiCL file.
  ...
```

Now ready to start Exercise 1 and 6, working with Pandora in LArSoft