Midas Installation Notes

Department of Physics
University of Regina

September 21, 2012

Abstract

This documentation is written to explain the installation procedure of the MIDAS data acquisition system.

Note: The basic steps of midas installation is explained under:

TRIUMF MIDAS Webpage [1]

This documentation will only summarize the procedure.

1 Setup Before Installation

Edit .cshrc file and add the following

```
setenv LANG C
setenv CVS_RSH ssh
setenv MIDASSYS $HOME/packages/midas
setenv ROOTSYS  $HOME/packages/root
setenv MIDAS_EXPTAB $HOME/experiment/exptab
# setup the MIDAS mserver
switch (`hostname`)
```

[1] https://www.triumf.info/wiki/DAQwiki/index.php/Setup_MIDAS_experiment

```
case larch*:
    unsetenv MIDAS_SERVER_HOST
    breaksw
default:
    setenv MIDAS_SERVER_HOST larch.phys.uregina.ca:7071
endsw
# select 64-bit or 32-bit MIDAS and ROOT
switch (`uname -i`)
case i386:
   setenv PATH .:$MIDASSYS/linux-m32/bin:$PATH
   breaksw
default:
   setenv ROOTSYS $HOME/packages/root
   setenv PATH .:$MIDASSYS/linux/bin:$PATH
endsw
setenv PATH .:$HOME/online/bin:$HOME/packages/roody/bin:$PATH
setenv PATH .:$HOME/packages/roody/bin
```

Note that `MIDAS_SERVER_HOST` needs to be set accordingly. `ROOTSYS` should be set according to the actual ROOT directory on the computer, if ROOT is installed from Linux distribution, the do not set `ROOTSYS`.

2 Packages checkout and compilation

Note: Root installation will not be covered here

2.1 Install MIDAS

```
$ cd $HOME/packages
$ svn co svn+ssh://svn@savannah.psi.ch/repos/meg/midas/trunk midas
  (Password "svn"). (password has to be entered twice)
$ svn co svn+ssh://svn@savannah.psi.ch/repos/meg/mxml/trunk mxml
$ cd midas
$ make
$ check that linux/bin/odbedit has been created
```

2.2 Install ROOTANA

```
$ cd $HOME/packages
$ svn checkout https://ladd00.triumf.ca/svn/rootana/trunk rootana
  (say "p" to accept the ladd00 ssl certificate,
       use username "svn", password "svn")
$ cd rootana
$ make
```

2.3 Install ROODY

```
$ cd $HOME/packages
$ svn checkout https://ladd00.triumf.ca/svn/roody/trunk roody
$ cd roody
$ make
$ $HOME/packages/roody/bin/roody
```

2.4 ROOT Configuration Comments

Depending on how ROOT packages are installed into the computer, there are some issues regarding the `root-config` command, which calls the ROOT library.

If the root is installed with the RPM from the linux distribution, in `Makefile`:

```
shell $(ROOTSYS)/bin/root-config --libs
```

will not function. Thus, it needs to be changed to

```
shell /root-config --libs
```

then problem is fixed. User may or may not be required install extra root packages from the distribution. The self compiled version of ROOT should not have this issue

3 Configurations & Trouble shoot

Note: this section is most important .

3.1 Setup Multiple Experiments

There are many ways to setup experiments, I would introduce our way of setting up.

The main experiment directory is in: $HOME/experiment

And there are many sub experiments under this dir. There is main exptab file under $HOME/experiment/exptab which collects the information for all sub experiments, and each sub experiments have their own exptab which only contain sub experiments info.

3.2 Exptab File

Exptab file setting is extremely important.

It contains the experiments information of Experiment name, Experiment Dir and User name.

Example:

```
gaintest   /home/midasdaq2/experiment/gaintest    midasdaq2
simpletest /home/midasdaq2/experiment/simple_test midasdaq2
muon-test  /home/midasdaq2/experiment/muon08-test midasdaq2
```

The main exptab file (under `$HOME/experiment/`) should have information for all sub experiments, the exptab file in sub experiments should only contain its information.

3.3 Sourcing steup.sh

When data acquisition system starts, the `start_daq.sh` script will try to source the setup.sh, one MUST check if the `setup.sh` is set up correctly.

Always set `$MIDAS_EXPTAB`:

```
export MIDAS_EXPTAB=./exptab
```

Other setting are optional.

3.4 Resolve the Root Privilege Issue

With CAMAC crate, in order to access the controller, one need to use $dio ./frontend command to bypass the driver. If Midas is not install on root account, dio owner must be changed to root.

If 64 bits do:

```
$ su -c "chown root $MIDASSYS/linux/bin/dio"
$ su -c "chgrp root $MIDASSYS/linux/bin/dio"
```

and 32 bits do:

```
$ su -c "chown root $MIDASSYS/linux-m32/bin/dio"
$ su -c "chgrp root $MIDASSYS/linux-m32/bin/dio"
```

Then set user or group ID on execution

```
$ su -c "chmod a+s $MIDASSYS/linux/bin/dio"
```

or

```
$ su -c "chmod a+s $MIDASSYS/linux-m32/bin/dio"
```

Warning: If this procedure is not done, dio will require root privilege to execute. Which implies no other user is able to run frontend and collect data!

4 Get started with an example experiment

We will go through a example experiment to test all MIDAS configuration.

1. Copy `$MIDASSYS/examples/experiment/` to `$HOME/experiment/testexperiment`
2. Edit both `exptab` files
3. check `testexperiment/setup.sh` (IMPORTANT), comment out `$MIDASSYS` option
4. `$ make`
5. `$ ./startdaq`
6. `$ firefox localhost:8081`

5 MIDAS Analyser

For some reason, the MIDAS Analyser has default crazy pedestal values for all ADC channels, one must check the before running MIDAS, to verify:

```
$ cd PATH/To/Experiment
$ odedit
```

```
$ cd "Analyzer/Parameters/ADC calibration/"
$ ls
```

Make sure that Pedestal values are set to 0, if not

```
$ set Pedestal[*] 0
```

5.1 Covert .mid file to .root File

When converting .mid to .root file, the analyser pedestal will be overwrote by the pedestal settings during the data taking. If the data pedestal is set to be correct, execute

```
$ analyser -i runXXXX.mid -o runXXXX.root
```

And data were taken with wrong pedestal, reset the pedestal values and use `-P` option to prevent the pedestal values being overwritten, an example is given as:

```
$ analyser -i runXXXX.mid -o runXXXX.root -P "/Analyzer/
  Parameters/ADC calibration"
```

5.2 Covert .mid file to .asc file

To convert .mid file to .asc file, execute

```
$ analyser -i runXXXX.mid -o runXXXX.asc
```