To Install NSCL DAQ

Richard Longland and John Kelley

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Prerequisites

General

- build-essential
- openssh-server
- magit
- libgsl0-dev
- subversion

nscldaq

- swig2.0 (swig in debian)
- gengetopt
- tcl8.5-dev # defaults to tcl8.6 in ubuntu
- tk8.5-dev # defaults to tk8.6 in ubuntu
- libtk (tklib in debian) # these give runtime errors if not present
- libtcl (tcllib in debian)
- libcppunit-dev # no errors in configure about this but it's needed!
- ftpd
- rsh-server
- rsh-client
- libusb-dev

spectcl

- libmotif-dev (liblestif2-dev in debian)
- imagemagick
- libgd-dev (libgd2-xpm-dev in debian)
- byacc # build error about yacc
- flex
- bison
- gri
- libtk-img-dev
- itcl3-dev
- itk3-dev

- iwidgets4
- bwidget
- blt-dev
- libxt-dev

General

- Install in `/usr/opt/`
- **DO NOT TRY ANYTHING ELSE!** There are some hard coded references in the code to this directory so it's just not worth your trouble…
- Build everything as root
  - `sudo su -`
  - `cd /usr/src/`
  - `mkdir NSCLDAQ`
  - `mkdir SpecTcl`

For NSCLDAQ

- `http://sourceforge.net/projects/nscldaq/`
- I'm using Version 10.2.108
- By the way, if you screw up in here, make sure you `make clean` and remove any installed files before trying again!
- Download to `NSCLDAQ` directory and untar (`tar -xzvf nscldaq-10.2-108.tar.gz`)
- `cd nscldaq-10.2-108`
- Compile
  - `./configure --prefix=/usr/opt/nscldaq/nscldaq-10.2-108 --enable-usb`
  - `make`
  - `make install`
  - `ln -s /usr/opt/nscldaq /usr/opt/daq`

For SpecTcl

- `http://sourceforge.net/projects/nsclspectcl/`
- I'm using Version SpecTcl-3.3-016
- Download to `NSCLDAQ` directory and untar (`tar -xzvf SpecTcl-3.3-016.tar.gz`)
- `cd SpecTcl-3.3-016`
- `./configure --prefix=/usr/opt/spectcl/SpecTcl-3.3-016 --with-tcl-libdir=/usr/lib/x86_64-linux-gnu/`
- `make`
- Touch some files to avoid errors in documentation
  - `touch ccusb/dummy.html`
  - `touch vmusb/dummy.html`
- `make install`

Set up some "current" links

- `ln -s /usr/opt/nscldaq/nscldaq-10.2-108 /usr/opt/nscldaq/current`
- `ln -s /usr/opt/spectcl/SpecTcl-3.3-016/ /usr/opt/spectcl/current`

Post-install

- Log out of root
  - `exit`
  - `cd`
- Do "the ssh trick"
  - `ssh localhost`
  - Answer "yes"
  - Enter password to log in, then `exit` to log out
  - `ssh-keygen` and don't use a password (choose all defaults)
  - `cat ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys`
- Find the nscldaq file in the source directory
  - `mkdir -p /home/daq/Live`
  - `cp /usr/src/NSCLDAQ/nscldaq-10.2-108/nscldaq ~/NSCLDAQ`
  - Edit the nscldaq file (This has all been done and the file is in `/home/daq/NSCLDAQ/PostInstallFiles`)
    - Make `DAQHOME=/usr/opt/nscldaq/current`
    - Fix the bash script to make == into =
    - Make `PIDFILEDIR=/home/daq/Live`
    - Make sure ~PORTMGRSWITCHES=""~
  - Make it executable: `chmod u+x nscldaq`
  - `sudo ./nscldaq start`
  - `sudo ./nscldaq status`
  - `sudo ./nscldaq stop`
  - `sudo ./nscldaq status`
- Copy this file into `/etc/init.d/`
- Link in runlevels so that it starts on boot
  `sudo update-rc.d nscldaq defaults`
- `ls /etc/rc2.d/` (You should see it in there somewhere)
- Reboot and check if it's running
  `sudo /etc/init.d/nscldaq status`
  or
  `ps aux | grep DaqPortManager`
  `ps aux | grep RingMaster`

Environment

- In .bashrc put the following (my version is in PostInstallFiles)
  - `export HOMEDIR=$HOME`
  - `export NSCLBASE=$HOME`
  - `export DISTDIR=/usr/opt/applications`

  - `export BinDir=$HOMEDIR/bin`
  - `export DAQHOST=localhost`
  - `export SSHTARGET=localhost`
  - `export INSTROOT=/usr/opt/nscldaq/current`
  - ~export TCLLIBPATH="$TCLLIBPATH $INSTROOT/lib $INSTROOT/Scripts $INSTROOT/TclLibs"~
  - `export PATH=$PATH:/usr/opt/nscldaq/current/bin:/usr/opt/spectcl/current/bin:~/bi`
- There are some files needed in `~/bin`. I'll put these in `/home/daq/NSCLDAQ/PostInstallFiles/bin`
  - Menu
  - startCfd
  - startReadout
  - startScaler
  - startSpecTcl
- Put the Menu application in `/usr/opt/applications`.
  I've put it in `/home/daq/NSCLDAQ/PostInstallFiles/menu`
  - `sudo mkdir /usr/opt/applications`
  - `sudo cp -r /home/daq/NSCLDAQ/PostInstallFiles/menu /usr/opt/applications/`
- Make an event directory and link it
  - `mkdir ~/events`
  - `ln -s ~/events ~/stagearea`

Bin files

These files are all found in `/home/daq/NSCLDAQ/PostInstallFiles/bin/`

- Menu
  - A simple bash script to run the menu application
  - `wish $DISTDIR/menu/Menu.ui.tcl &`
- startReadout
  - Make sure this points at
  - `/usr/opt/nscldaq/current/bin/ReadoutShell`
  - with `-host=localhost`
  - and `-path=/usr/opt/nscldaq/current/bin/VMUSBReadout`
- startScalers
  - Make sure this points at
  - `/usr/opt/nscldaq/current/bin/ScalerDisplay`
  - Read the settings from `/config/scalerConfig.tcl`
- startSpecTcl
  - This one points at SpecTcl run file
  - cd into the script directory
    `cd ~/config`
  - `exec /usr/opt/spectcl/current/bin/VMUSBSpecTcl </dev/null &`

Setup Experiment

- The setup is in `~/config`
- Copy this from `/home/daq/NSCLDAQ/PostInstallFiles/config/`

- Do the same for the `spectcl` directory
  - `cp /home/daq/NSCLDAQ/PostInstallFiles/spectcl /home/daq/`

Running with USB

- Users need access to the USB device. If you get an error that looks like
  `CTheApplication caught a string exception: usb_get_string_simple failed in CVMUSB`

It's probably because the user does not have USB access.

- First check that the VM-USB card is found by:
  - Run `tail -f /var/log/syslog`
  - Unplug and replug the USB cable
- Some udev rules need to be set
  - Edit `/etc/udev/rules.d/90-usb.rules`

    ```
    SUBSYSTEM=="usb", ENV{DEVTYPE}=="usb_device",   MODE="0666"
    ```

  - **NOTE:** This is slightly different from the `usb_device` subsystem used in previous versions
  - This will allow users to read and write to the usb device
- **If this doesn't work**
  - First try changing 90 to 95 in the filename above. No need to reboot, just unplug and replug the USB cable
  - here are some useful testing utilities
  - Find the device (not simply `/dev/usb0` as in old linux kernels)
    - In Ubuntu, do the following. In debian, you need to figure out which device to use some other way!
    - `less /var/log/udev`
    - Look for VM-USB
    - eg. `DEVNAME=/dev/bus/usb/002/004`
    - Use this `DEVNAME` in the commands below
  - Read all of the attributes of this device with
    `udevadm info -a -n /dev/bus/usb/002/004`
  - Test the udev rules as you edit them with
    `udevadm test $(udevadm info -q path -n /dev/bus/usb/002/004) 2>&1`
  - You should see the `/etc/udev/rules.d/90-usb.rules` get sourced and the permissions of the device get set to "0666"