Message Passing/Run control ~~plan~~ ideas.

Eric, Yale, 23-Jan-2013

With an eye toward getting a calibration run up and running.

DDS vs XMPP

- We had said we were going to use NOvA's DDS to control State transitions and just generally pass messages.
  - Calibration run is one example.
- There seems to be some dissatisfaction -- or absence of enthusiasm by DDS's purveyors, let's say. It is alleged to be heavyweight, in any case.
- XMPP option pursued by Darkside50/Ron R. And I've done some investigation here.
- Need:
  - run control with easy-build GUI
  - server
  - client inside C++ to listen for instructions

gloox

- xmpp client.
- used to block and await instructions to make state transitions
- I downloaded and built it easily from a tarball.

ejabberd

- xmpp server
- run as a daemon to fwd commands to client from GUI.
- responses from client back to GUI

pygtk

- GUI building tool to lay out a run control GUI
- Actual xmpp commands sent via xmpppy imported into the python

Calibration example

Inside std::streamsize hwutils::XMITStreamReader::readsome ( )

```
gloox::Bot::handleMessage(connect_object,message_node)
{
        command = str(message_node.getBody())

        process = subprocess.Popen(command,shell=True,stdout=subprocess.PIPE, stderr=subprocess.PIPE)
        message = process.stdout.read()
        if message==="":
            message=process.stderr.read()

        connect_object.send( xmpp.Message( message_node.getFrom() ,message))
}
```

```
if ( !_loopNumber ) {

   /* Request operator's interaction*/
     if (_loopNumber%_NConfigASICS) // let's configASIC
       message_node = requestMessage()  ;
       handleMessage(connect_object,message_node);
     if (_loopNumber%_NConfigPULSER) // let's configPULSER
       message_node = requestMessage()  ;
       handleMessage(connect_object,message_node);

     //   with NConfigPULSER < _NConfigASICS


      _triggerCallFunction();
          mf::LogDebug(_stream_name+ "XMITStreamReader") << "We just issued a trigger...wait a second, and then data.";
     if ( _stream_name == "NU" )
      usleep ( 1000000 );
   }
```

Calibration example cont'd

Very schematic

Meanwhile, On the Run (GUI) side ...

```
#!/usr/bin/env python
 import xmpp
 import gtky

jid = xmpp.protocol.JID('daq@uboonedaq-evb.fnal.gov')
cl=xmpp.Client(jid.getDomain(),debug=[])
cl.connect()

cl.auth(jid.getNode(),'password')
cl.receiveMessage(string commandFromRunCtl) // wait for readsome()

if commandFromRunCtl==”configASICS -zDev1 -g2 -r3 ”;
  cl.send(xmpp.protocol.Message('daq@uboonedaq-
evb.fnal.gov',commandFromRunCtl))
if commandFromRunCtl ==”configPULSER -a2 -f10000 -p20 ”;
  cl.send(xmpp.protocol.Message('daq@uboonedaq
evb.fnal.gov',commandFromRunCtl))
```

Calibration, contd

Even more simply, we can execute commands inside readsome() with shell commands and skip.

Or, more correctly, we transition actual states. This seems time prohibitive. But not doing this means we haven't flushed buffers, aren't sure which data corresponds to which config. Kinda ugly.