

Slow Controls

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- Overview
- Acnet
- APACS & iFIX
- Integration into Run Control

- **Slow controls in MIPP:**
 - **Monitor and/or set devices at slow rate**
 - Beam line magnets, gas systems, mirrors in beam Ckows, analysis magnet power supplies, Hall probes, rack monitoring, various HV systems, etc.
 - **No one system does it all**
 - Acnet has to be involved with the beam line magnets
 - APACS is more powerful for gas systems
 - 'home-brew' driver for LeCroy 1440 HV, ...
 - **Different systems should (need) to be integrated**
 - User does not care about the underlying system, just cares about *simple* control

- Acnet

- Beams Division (Accelerator) Controls network

- Supported from Beams Division
 - We don't have to do all the work ourselves
 - cf. Brian Kramper's talk <http://ppd.fnal.gov/experiments/e907/Meetings/collab6/kramper.pdf>
 - In Acnet devices have strange names, for MIPP of the form **F:Mxxxxx**
 - Comments (somewhat) explain what a device does
 - These devices are listed on pages, for MIPP on page **S17**
 - Accessible from Terminals in MC7, portacamp (soon), a laptop, etc.

- Beam line magnet controls

- ... or monitoring. It is under discussion how much control we (as opposed to the Main Control Room) will have. (Safety, etc.)

- Other systems

- JGG and Rosie power supplies (MC7AN1 and MC7AN2)
 - Hall probes that monitor JGG and Rosie (MJGG01, MJGG02, MROS01, and MROS02)
 - Motor controls for beam Ckov mirror adjustments
 - HV for all wire chambers (Droegie supplies):
Physically located in portacamp, *must read back* into DAQ, may or may not set remotely

- APACS

- Commercial control system

- Reliable, high MTBF
 - cf. Rich Schmitt's talk <http://ppd.fnal.gov/experiments/e907/Meetings/collab7/schmitt.pdf>
 - Allows complex programs to run in control unit
 - LabView-like programming interface
 - This simplifies communication with devices
 - *Need to purchase* some hardware, share a lot with BTeV
 - Devices are controlled from a PC running iFIX

- Beam Cherenkov detectors

- APACS controls gas flow based on set-pressure calculated from beam energy set by user! [Beam energy determines index of refraction, i.e. density (for known gas), i.e. pressure and temperature (through real gas equation)]

- (almost) everything else

- Control of other systems is simple compared to beam Ckov

- Integration of slow controls into Run Control

- Different systems

- Non-trivial, need information from many people
 - Need slow control abstraction to integrate different systems for uniform presentation to people on shift and to Run DB.
 - I am not working on this now.

- Acnet

- Devices can be set and read from Acnet console.
 - Devices can be read from Run Control (or anywhere else) through Java interface or XML-RPC, e.g. :

```
#!/usr/local/bin/python
from xmlrpclib import Server
print Server("http://www-bd.fnal.gov/xmlrpc/Accelerator").getReading("F:MC7AN1");
```
 - Setting devices from Run Control may be difficult
 - BD does not want to cut holes into their firewall

- APACS

- Just getting started on this
 - Need to set and read back devices
 - No firewall issues