
DAQ Status & Plans

GlueX Collaboration Meeting – Feb 21-23, 2013

Jefferson Lab

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Overview

- **Current Status Update**
 - CODA3, Hall D tasks etc...
- **DAQ Test Stand**
 - Counting House setup
 - Timeline, Testing plans
- **Summary**

Current Status

- Still 2 supported releases (through startup of 12GeV)
 - CODA 2.6.2 (standard operational release)
 - NO: Event Blocking, EVIO Version 4 files
 - End of Life – no further development – only support
 - CODA 3.0 (currently Beta)
 - NO: EVIO Version 1 files, vxWorks ROCs
 - Under rapid development – changes are frequent
- New useful Tools developed for CODA 3 configuration and monitoring:
 - Jcredit - COOL Run Configuration editor
 - Jeviodmp – EVIO v4 file viewer
- CODA 3 developments are at a point where availability of all the new hardware in a large data acquisition test stand is highly desired to work out many details/features/bugs!

VME CPU status...

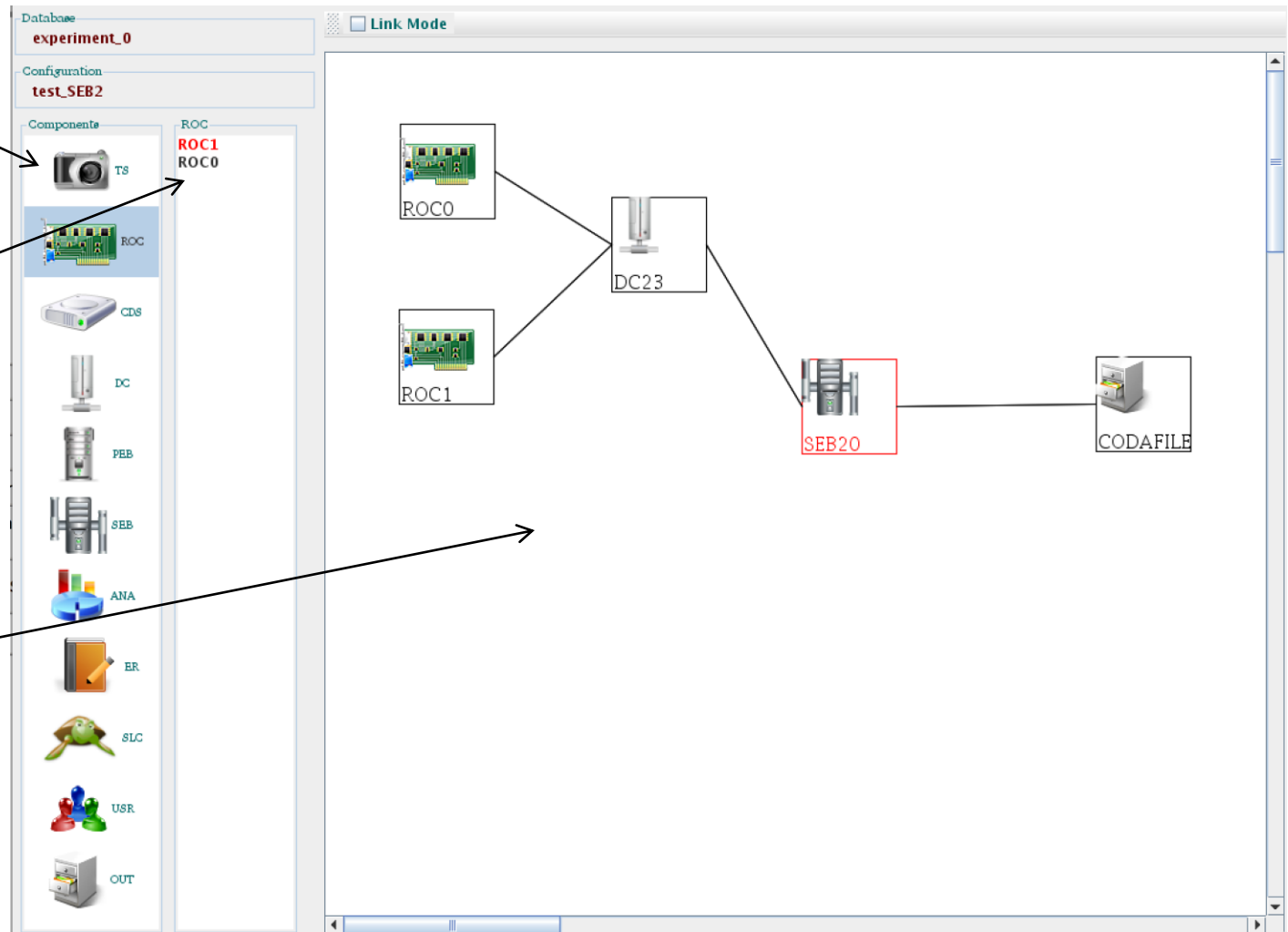
- VME CPU procurement was only partially completed this fall.
 - New 3rd gen Intel Core i7 boards did not initially pass our low level VME tests (it has since been resolved).
 - A small order of 2nd Gen boards were ordered to cover near term needs (Hall D ordered 7).
- GE Intelligent Platforms won the bid (~1K/CPU cheaper) over Concurrent Technologies.
- A final PO for the remainder of boards can happen when desired (anytime this fiscal year)
- A final technical note: Concurrent boards support direct VXS (PCIe) high-speed access to switch slot boards (ie CTP,GTP). This may be useful in some crates (L1 trigger).

COOL Configuration Editor (**jcedit**)

Component
Classes

Defined
components

Configuration
Layout
(double-click icon
to get component
details)



Run Control GUI

- User interface to DAQ including:
- Control buttons
 - Config parameters
 - Run Status
 - Component status
 - Event/Data Rates
 - System messages

The screenshot shows the Run Control GUI with the following components:

- Platform:** Sessions, Configurations, Options, Expert, User, Help
- Start Time:** 15:09:22
- End Time:** 15:11:57
- Date:** 18 February
- Run Parameters:**
 - Expid: experiment_0
 - Session: davetest
 - Configuration: test_SEB2
 - Output File: /daqfs/scratch/data/test_SEB_7435.evt
- Run Status:**
 - Run Number: 7435
 - Run State: ended
 - Event Limit: 0
 - Total Events: 152
 - Data Limit: 0.0
- Component Status Table:**

Name	State	EvtRate	DataRate	In-EvtRate	In-DataRate
SEB20	downloaded	0.0	0.0	1.0	0.2
DC23	downloaded	0.0	0.0	1.0	0.2
ROC1	downloaded	0.0	0.0	1.7	0.2
ROC0	downloaded	0.0	0.0	1.7	0.2
- Graph:** Event Rate vs Time (15:09:00 to 15:09:20). Legend: DC23 (purple), SEB20 (teal).
- Message Log:**

Name	Message	Time	Severity
sms_test_SEB2	Go is started.	15:09:19 02/18	info
sms_test_SEB2	Go succeeded.	15:09:22 02/18	info
sms_test_SEB2	End is started.	15:10:51 02/18	info
sms_test_SEB2	Waiting for DC23,	15:11:00 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:05 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:10 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:15 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:20 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:25 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:30 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:35 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:40 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:46 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:51 02/18	warning
sms_test_SEB2	Waiting for DC23,	15:11:56 02/18	warning
sms_test_SEB2	End succeeded.	15:11:57 02/18	info

Jevio Event Dump Utility (jeviodmp)

File View Event

< prev next > event source /home/abbott/d/coda/data/test_SEB_7432.evt event# 90

Go to event # 130 dictionary num events 130

EVIO event tree

- <Event> has BANKs: tag=65392(0xff70) num=1(0x1) len=44 dataLen=43 children=3
 - BANK of SEGMENTS: tag=65312(0xff20) num=2(0x2) len=8 dataLen=7 children=4
 - SEGMENT of ULONG64s: tag=0(0x0) len=2 dataLen=2 children=0
 - SEGMENT of USHORT16s: tag=0(0x0) len=1 dataLen=1 children=0
 - SEGMENT of UINT32s: tag=0(0x0) len=0 dataLen=0 children=0
 - SEGMENT of UINT32s: tag=1(0x1) len=0 dataLen=0 children=0
 - BANK of BANKs: tag=16384(0x4000) num=1(0x1) len=16 dataLen=15 children=2
 - BANK of UINT32s: tag=16389(0x4005) num=1(0x1) len=4 dataLen=3 children=0
 - BANK of UINT32s: tag=16388(0x4004) num=1(0x1) len=9 dataLen=8 children=0
 - BANK of BANKs: tag=16385(0x4001) num=1(0x1) len=16 dataLen=15 children=2
 - BANK of UINT32s: tag=16389(0x4005) num=1(0x1) len=4 dataLen=3 children=0
 - BANK of UINT32s: tag=16388(0x4004) num=1(0x1) len=9 dataLen=8 children=0

1	2	3	4
0x10425701	0x0f012001	0x00010002	0x00000058
0xa0734cff	0x965a0057	0x965a0057	0x20000004

progress

structure BANK tag 16388 length 36 bytes

data type UINT32 number 1 description ???

Hall D Online tasks for DAQ Group

Projects “completed”:

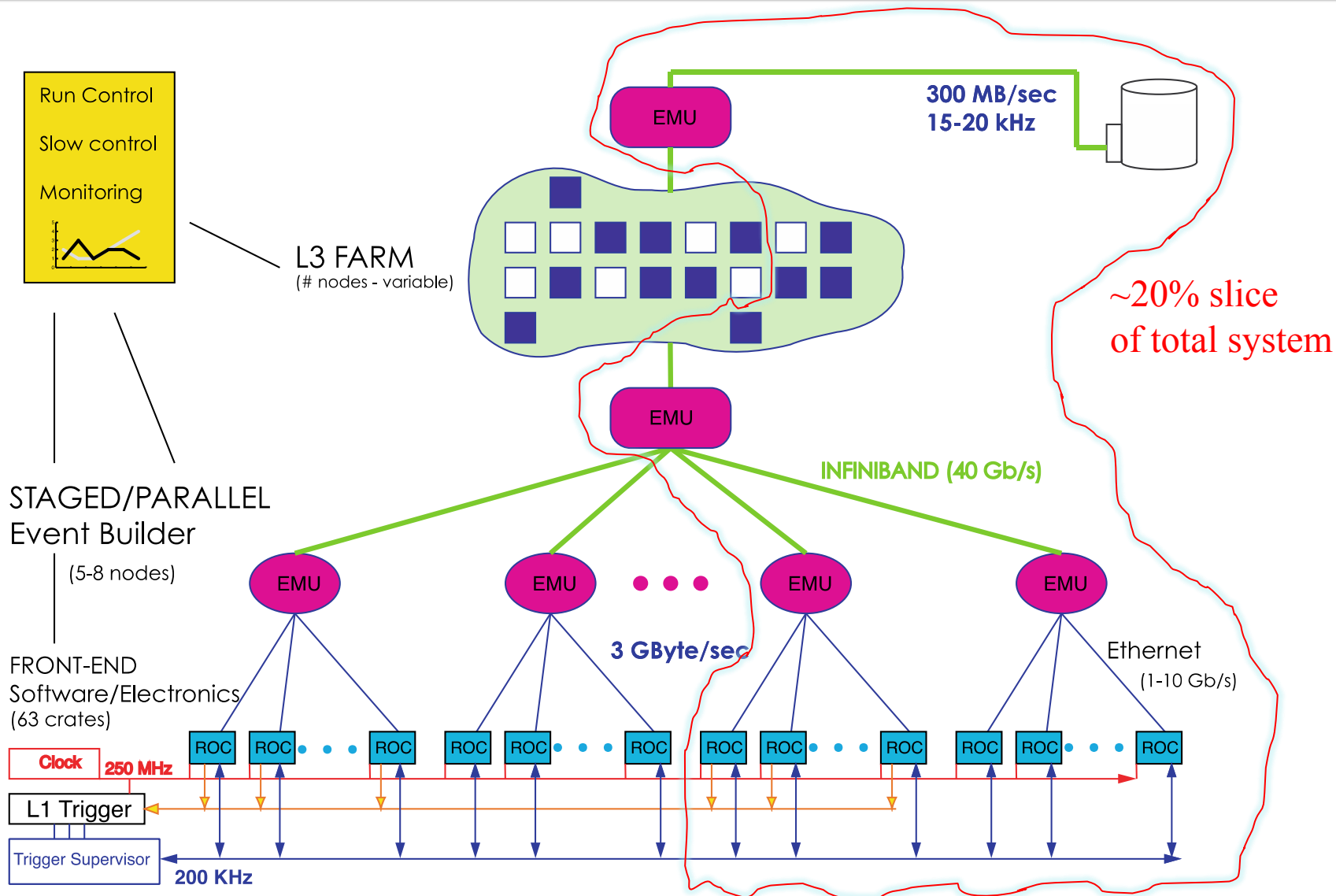
- Design framework and prototype Hall D Farm monitoring architecture (AF ECS-based Process and Hardware monitoring/control Agents available)
- Create DAQ-like EVIO files from Monte Carlo data (**mc2coda** library)

Projects in various stages of development:

- Self-configuring readout list with database storage of crate configurations
- Event disentangler tailored for Hall D crates
- Top Level Experiment control system supervisor and GUI
- Trigger Config/Control System and GUI

ALL of the projects still under development will benefit greatly from a non-trivial DAQ Test Stand (i.e. more than a few crates, all new hardware available for use)

GlueX DAQ System



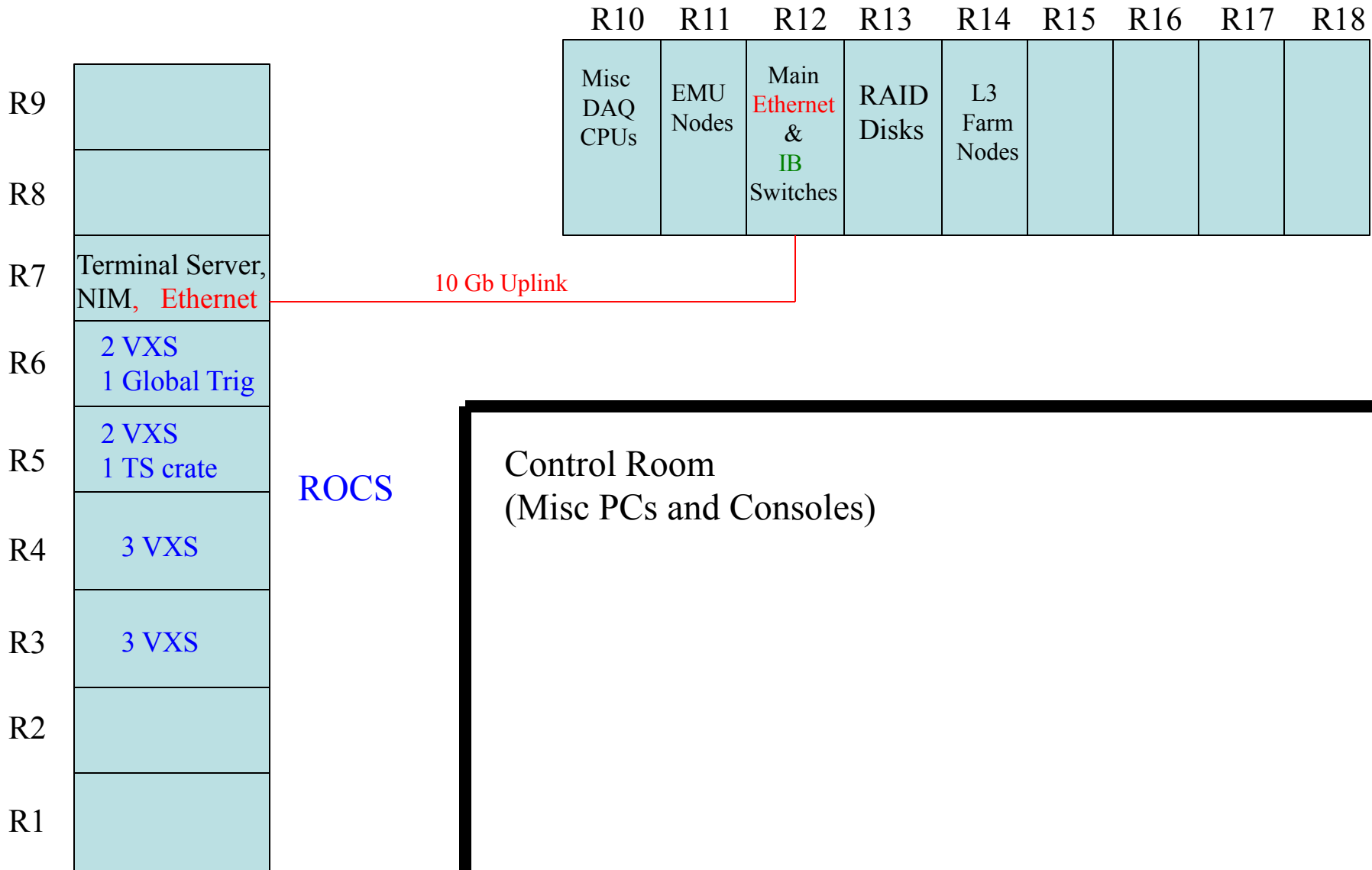
DAQ Test Stand

- Prior efforts
 - Many parts of DAQ system tested individually in small test stands
 - DAQ group unable to perform large-scale tests
 - Never had enough equipment/space
- Why test “slice” of full DAQ now?
 - Software/Hardware developments have matured.
 - Hall D has all the necessary equipment
 - Computing system available soon
 - Some hardware can be borrowed from CC and HPCC
 - Rack Room LHS is not in use – plenty of empty racks & power
 - Benefit to both DAQ/Electronics groups and they have manpower
 - DOE review this summer may focus on DAQ readiness

DAQ Test Stand – Timelines & Goals

- Rack Room ready now (all necessary power 110 & 208)
- Computing equipment (CPUs, switches, cabling etc...) is currently being installed.
- Plan to have a total of 12 crates (10 ROCs, TS, and Global Trigger crate). As crates are filled and tested by Fernando's group they will be installed in the rack room. Should have all by early April.
- Testing will include:
 - Performance testing with complex configs (multi-stage event building, asymmetric data streams).
 - Trigger/clock distribution, long-term stability, error detection, calibration and recovery.
 - Develop DAQ system partitioning with the TS
 - Much more...

Rack Room Setup



Summary

- The various pieces of CODA 3 are progressing. We are at a point where integration of these components is possible - and essential.
- We have all the necessary hardware to pull together a large DAQ test stand in the Hall D Counting house. We hope to keep this system in place through the fall.
- As Detector systems are installed in the Hall we will be able to integrate them into the DAQ system.
- Both Hall-based DAQ and the Rack room system will be able to run at the same time.