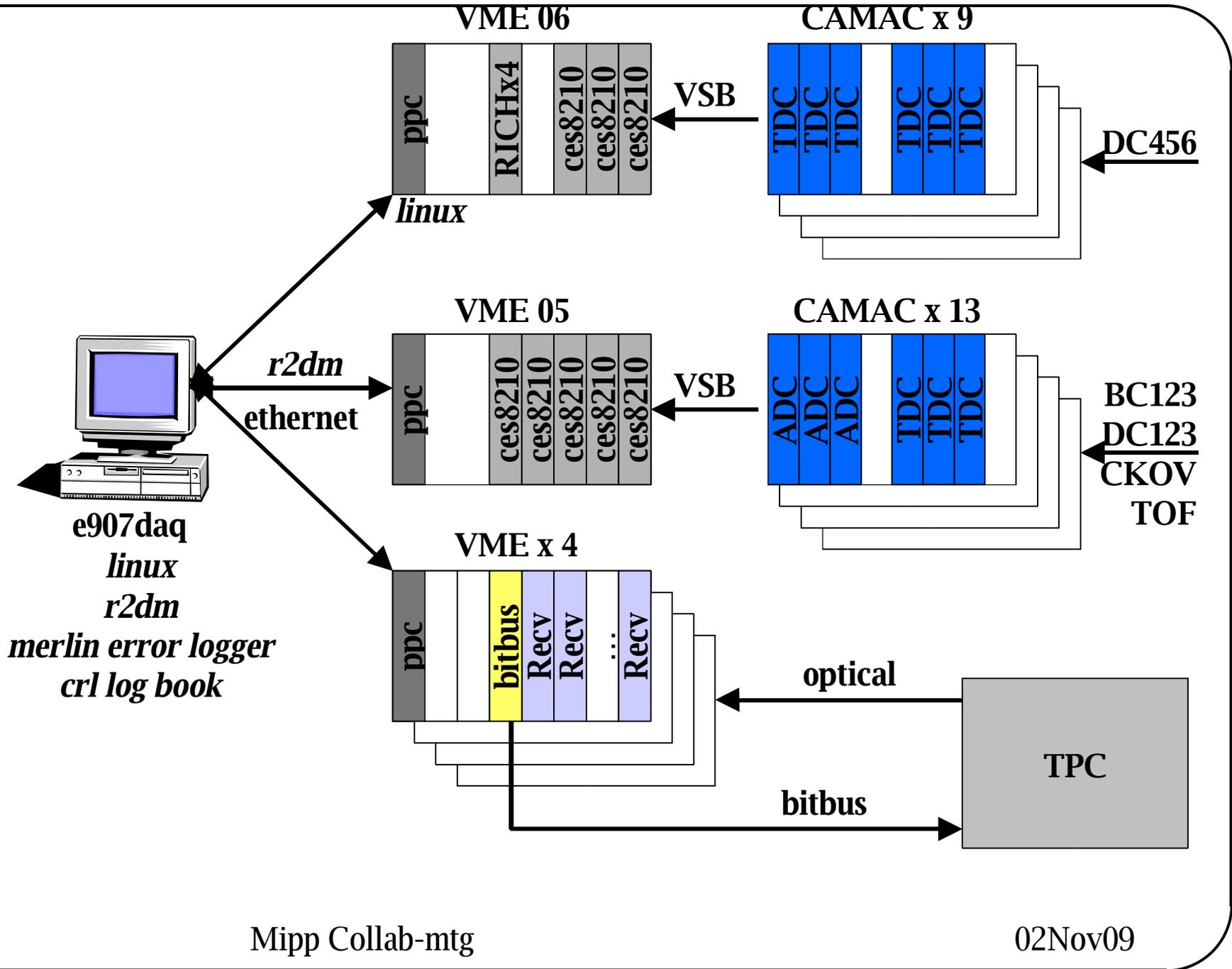


E907 DAQ Report

David Asner

for the E907 DAQ group

- Hardware Status
- Software Status
- Near Term Plans



Mipp Collab-mtg

02Nov09

Hardware Update

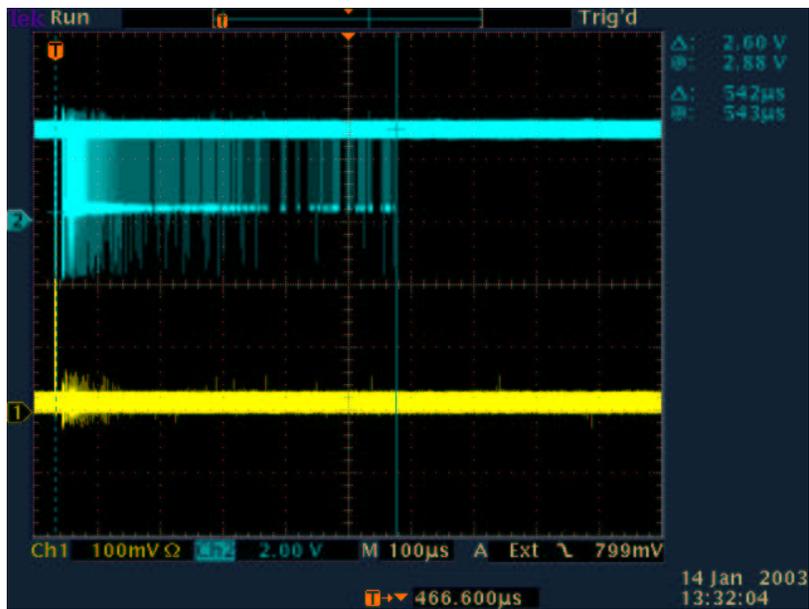
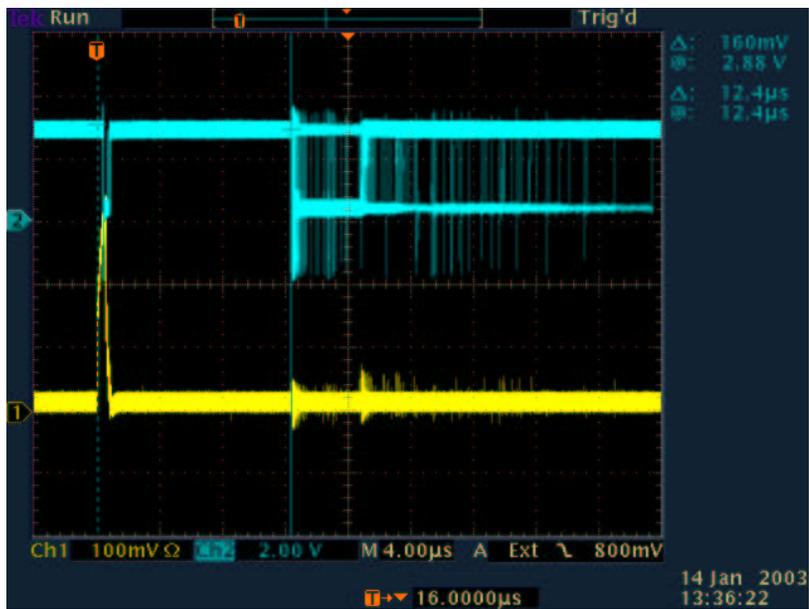
- Added CAMAC to the Harvard test stand
 - Andre has studied interrupt port on CES8210
- Received our 5 remaining PowerPC MVME-2434
 - Now have our full complement of 6+1 spare
 - 2 MVME-2432 and 5 MVME-2434 - nearly identical except for the memory 64mb vs 256mb
 - LINUX Kernel 2.2.9 + file system does NOT work with the MVME-2434. Problems with Universe driver.
- Obtained 22 and have access to 8 more TDC 2229 as required for TOF. Modules untested thus far.

CES8210 Interrupts



- Processes are registered by process ID with universe driver
- Falling edge CES8210 interrupt ports INT2 or INT4
- CES8210 raises one of the seven IRQ lines
- Universe driver gets the interrupt, gives it to linux 2.2.9, linux wakes up process (Trigger detector readout)
 1. Fastest signal to the process and wake it up is $\sim 12\mu s$.
 2. Rarely takes up to $\sim 550\mu s$ to get the signal.

CES8210 Interrupt Timing



LINUX Kernel for MVME-2434

- Universe driver in LINUX 2.2.9 kernel did not work
- Upgrade to LINUX 2.2.12 solved most of the problem

excerpt from linux-2.2.9

```
/* FIXME: kludge working (and not always) only on PreP */
#ifdef __powerpc__
universe.reg_base = (u_char *) 0x10000000 +
(base[rb] & PCI_BASE_ADDRESS_MEM_MASK);
#else
universe.reg_base =
ioremap(base[rb] & PCI_BASE_ADDRESS_MEM_MASK, 0x1000);
#endif
```

excerpt from linux-2.2.12

```
universe.reg_base =
ioremap(base[rb] & PCI_BASE_ADDRESS_MEM_MASK, 0x1000);
```

- Modified file system and kernel .config file to facilitate loading the universe driver as a module (rather than compile into the kernel).
- Instructions will appear on an E907 website near you and Andre will test. Andre will test at Harvard with the TPC-RICH software.

Online Software Update

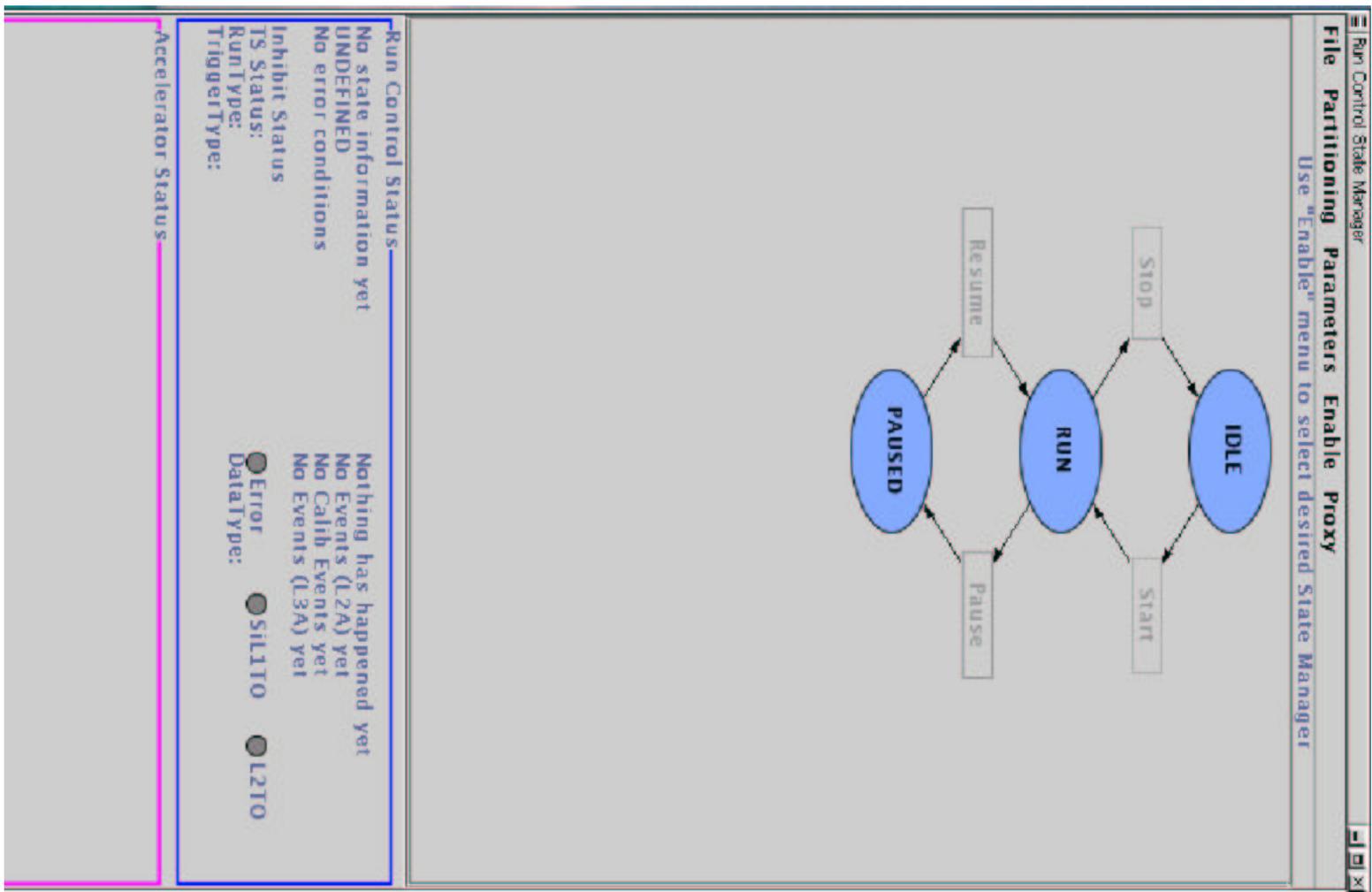
We use a large number of FNAL packages. The ones in red have been updated since our last collaboration meeting.

- Java/XML Run Control (`ode_rc`) requires
 - `ode_mps`, `java`, `xerces_java`, `elvin_java`
- R2DM client/server (`r2dm`) requires
 - `ZMutility`, `itc`, `thread_util`, `ace`
- E907R2DM client/server, E907messages
 - depend on all of the above + `elvin_c` + `elvind`

It was non-trivial to reproduce and then move beyond the “Vertical Slice” test we reported at the last meeting.

DAQ Chain Test (Vertical Slice)

- elvind (message passing) server running on DAQ Intel box.
- ode_rc running on DAQ server
 - modified XML to use elvind server at LLNL
 - modified “start” transition to include a sendmessage ACTION with a unique subject to start e907r2dm client on PPC and e907rdm server on Intel box.
 - modified test receiver running on Intel box to listen for start message from RC
 - Upon receiving start message e907r2dm server will start
- On PowerPC
 - Modified the test Receiver routines to listen for start message from ode_rc
 - Recall that DAQ teststand include PPC+VME+CES8210+CAMAC+ADC+TDC
 - Upon receiving start message client “events” will readout from ADC+TDC and sent via sockets to e907r2dm server and the server will write these events to a binary file
- Now with updated packages and with new MVME-2434



Java/XML Run Control

- Likely the only ONLINE software many of you will interact
- Goal of FNAL ODE group is to provide a generic tool that can be used for any experiment - maximally configurable
- Working with FNAL group to implement E907 specific features
- Most recent release ode_rc v0_4 - See diagram
 - 2 types of Actions
 - * `<Action Type="Begin" Method="PrintRCAction">"Entering State RUN"</Action>`
 - * `<Action Type="Begin" Method="SendMessageRCAction">subject:SIMPLE_MACHINE_SUBJECT, DestinationIds:Crate1 ,label:"Entering State RUN"</Action>`
 - Third action "SendMessageAndWait" is being written
 - Additional "Read/WriteDataBase" action is next
 - Configure server in XML file
 - * `<MPSServer Host="fnods.fnal.gov" Port="2917" />`
 - * `<MPSServer Host="192.168.1.2" Port="2917" />`

Message Logger, MPS

- Current version is Merlin v3_0_2
 - Send simple message in c (already c++ and java)
 - Ready to be tested on PPC
- Current versions: ode_mps v0_0_3 and elvin_c v4_1b3
 - Required for event builder to send/receive messages to/from run control
 - These packages are compiled with gcc rather than g++ and Luciano and I are sorting out problems with ode_mps, elvin_c and the new E907messages class.

Near Term Plans

- Incrementally upgrade vertical test as packages are updated and classes are written - E907messages, detector
- with the new classes, the Chain test will serve as a template for the beam cerenkov, chambers, cerenkov and tof detectors
- Implement CES8210 interrupt (from Andre) at LLNL
- Test LINUX-2.2.12 kernel (at Harvard) with TPC-Rich class.
- upcoming Java/XML features
 - New ACTION - Sendmessage and Wait
 - Receiver (or Listener) within Run Control
 - RC Actions to Read/Write from Database
 - Need configurable pull down menus
- Database + Interface
 - Define interface to “data processor” for each detector system
 - Detector systems need to define set of tables that will be in database
 - Need versioning for these tables