L3 DAQ
the past, the present, and your future

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for the L3DAQ group

DAQ Shifters Meeting 26 Mar 2002
The (soon to be) Past System
All ethernet, except for TFW communication

The Future System

CISCO 6509 Switch

Supervisor CPU

COOR

Farm CPU

Farm CPU

48 farm nodes

Routing Master CPU

TFW info

trigger disable

48 farm nodes

ROC SBC

ROC SBC

ROC SBC

ROC SBC

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SBCs

- **SBC (Single Board Computer)**
  - Intel ~1GHz, VME, dual 100Mb ethernet, 64MB flash for storage

- **“Dumb” Operation**
  - No communication with supervisor
  - All farm nodes connect to each SBC
  - Receive routing information from RM
  - Pull event fragment over VME
    - place in memory buffer
    - send to appropriate node when routing info arrives
A ReadOutCrate with SBC

- VME
  - J1 & J2
- SBC
  - Slave Ready
  - J3
  - Done
Farm Nodes

- Runs EVB/IO and Filtershell processes
- Filtershell
  - This is ScriptRunner (L3 filters)
  - Receives trigger programming info from supervisor
  - Receives full event from EVB process
- Event Builder (EVB) Operation
  - Each farm node connects to all SBCs
  - Receive crate list by event# from RM
  - Sends no. of free buffers to RM (“node ready”)
  - Builds full event from received fragments
  - No communication with supervisor
Routing Master (RM)

- Receives “run” information from supervisor
  - Farm node list and crate list per bit
- Gets bit fired by event# from TFW
- Receives no. of free buffers from each farm node
- Decides which nodes receive which events
- Sends routing info by event# to SBCs
- Sends crate list by event# to farm nodes
- Disables triggers when necessary
**Communication Flow**

- **Virtual SBC**
  - Routing info: destination farmnode by event
  - Bits fired by event

- **Routing Master**
  - Run information: crate and node list by trigger bit
  - Crate list by event
  - "node ready"
  - TFW info
  - trigger disable

- **Supervisor**
- **COOR**
  - ScriptRunner trigger programming

- **EVB**
- **Filter-shell**
- **Farm node**
Before the Future Begins

• Issues
  - SBC delivery/installation will be steady but slow
    • Several months
  - RM, SBC, EVB, and Supervisor software need real DAQshifter-level abuse

• Solution
  - Transitional SBC + VRC system
The Transition System

VRC CPU

ROC VBD

Virtual SBC

ROC VBD

Virtual SBC

ROC SBC

VBDi

ROC SBC

CISCO 6509 Switch

Supervisor CPU

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Transition System Status

- Super, RM, EVB, SBC all tested
  - They even work
- Use of the system is imminent
- Minor Issues / Big Changes
  - New monitoring
  - Control ("Reset L3")
  - Trigger Disable!!!
  - Experts
L3 Trigger Crate

- **TFW provides (ECL lines)**
  - **Output from L3DAQ**
    - 128 “disable” lines, one for each trigger bit
      - Can now only disable 32 bits for lack of hardware!!!
  - **Input to L3DAQ**
    - 16 bit L3 transfer number (event number)
    - 128 bit “L1/L2 AND terms” (which bits fired)

- **Under development**
  - “L3 Trigger Crate” to house the RM and receive/control TFW ECL lines
  - May take several months to complete
L3 Disable: Interim Solution

- Put RM on the TFW readout crate SBC
- Spy on the TFW data block
  - Extract L1 fired bits and L3 transfer number
- When L3-disable is needed
  - RM tells SBC to stop reading out the TFW crate
    - TFW crate goes front-end-busy and stops triggers
    - Acts as global disable
  - Sets a flag in the RM monitoring information
- Cons
  - The actual L3 Disable line is not used
  - Shifter must check L3DAQ monitoring every time TFW crate is 100% front-end-busy
  - All L2 decisions are ignored!
Control

- COOR <-> Supervisor communication unchanged
- Resetting L3 will be uncentralized
  - Farm node processes
    - online script "l3xreset"?
  - SBC and RM processes
    - online script "l3xdaq_reset"?
  - Supervisor and VRCs (virtual SBCs)
    - via the familiar “Farm Control” webpage
L3 DAQ Experts

- New expert contact list for L3DAQ
- Our expertise does not overlap yet
- At first
  - Andy (RM, SBC software)
  - Doug (VRCs, SBC hardware)
  - Ron (SBC hardware)
  - Gustaaf (EVB, Filtershell)
- Others will join
  - Reiner? Martijn? Gordon (Supervisor)?
Monitoring

- All processes (SBC, RM, super, EVB) produce monitoring info
  - EVB and Filtershell use separate monitor server
- Two new monitor clients
  - jMon will be deprecated
  - l3xmon
    - EVB and Filtershell info
  - üMon is the client of the future
    - SBC, RM, and Supervisor info currently
    - EVB info (missing crates!) added in future
    - Send comments to sean@fnal.gov
Summary

• Transition system in place very soon
• Bad news:
  - New problems, new monitoring, new experts, new instructions
• Good news:
  - Known VRC problems still around
  - Additional fun, excitement, and adventure
• Stay tuned to
  - d0daqshifters mailing list
  - http://d0onlinelx.fnal.gov/www/groups/l3daq/default.html