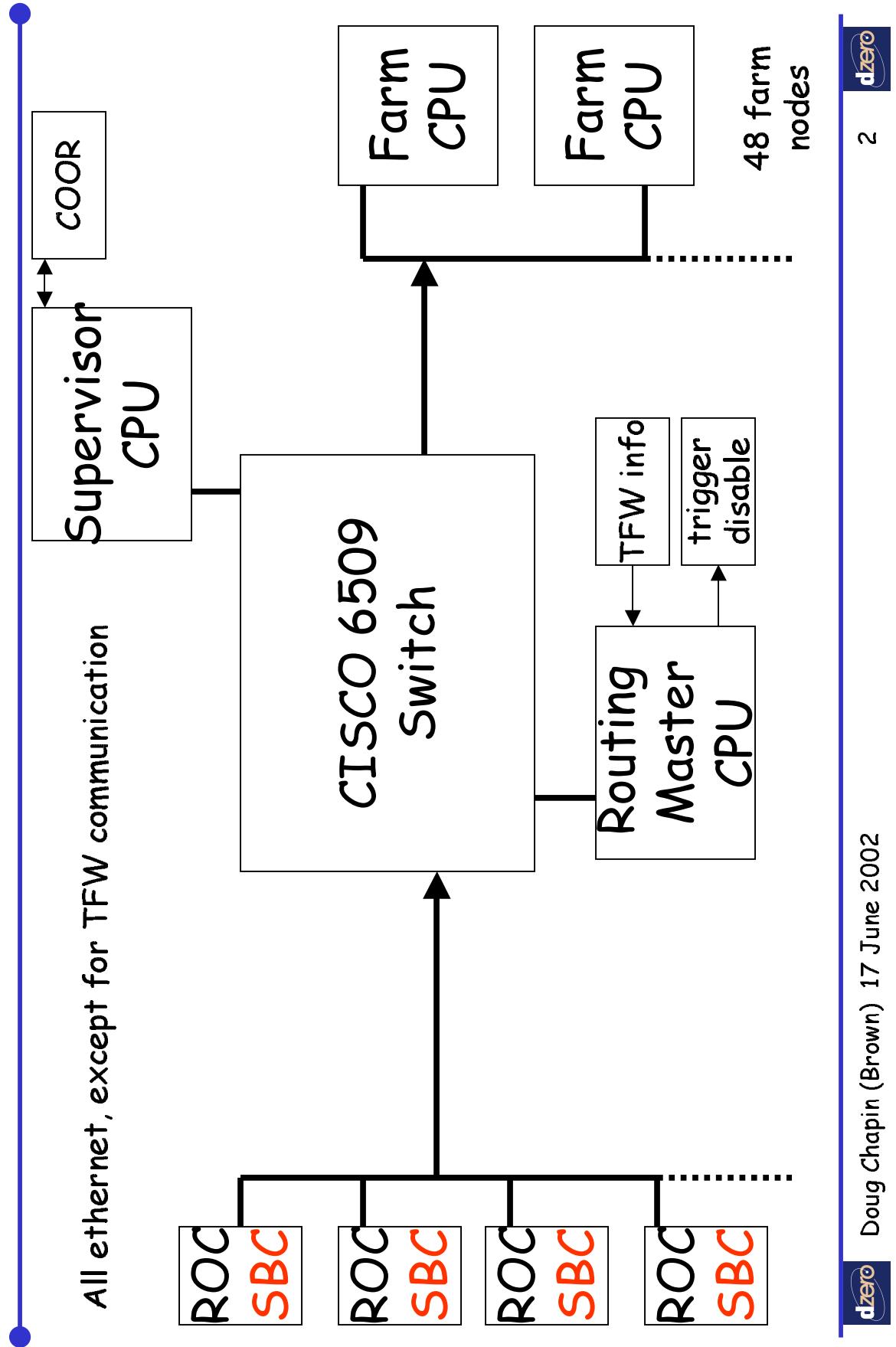


L3 DAQ Monitoring/Troubleshooting

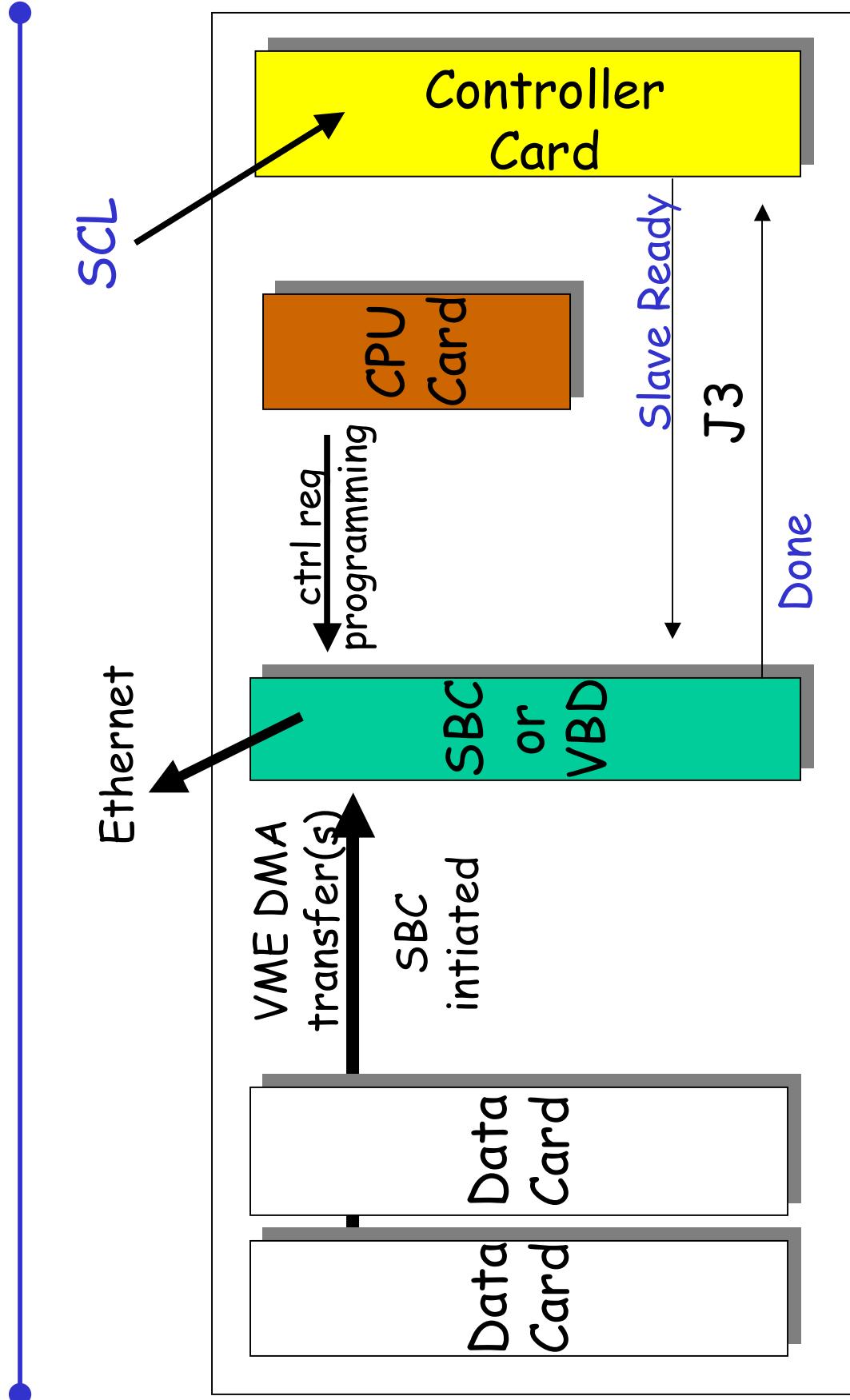
Doug Chapin
for the L3DAQ group

- Overview of L3 DAQ
- uMon
- Typical Issues

The L3DAQ System



ReadOutCreate Example



SBCs

- Intel ~1GHz, 128MB RAM, dual 100Mb ethernet, 128MB flash, VME Universe2
- VME slave interface
 - VBD control register emulation
 - Data buffer access
 - Component front-end debugging
- J3 Control (*SlaveReady,Done*)
 - DIO PMC add-on card
 - Also drives status LEDs
- Operation
 - No supervisor communication
 - Buffer event fragments in memory
 - Receive routing info from RM

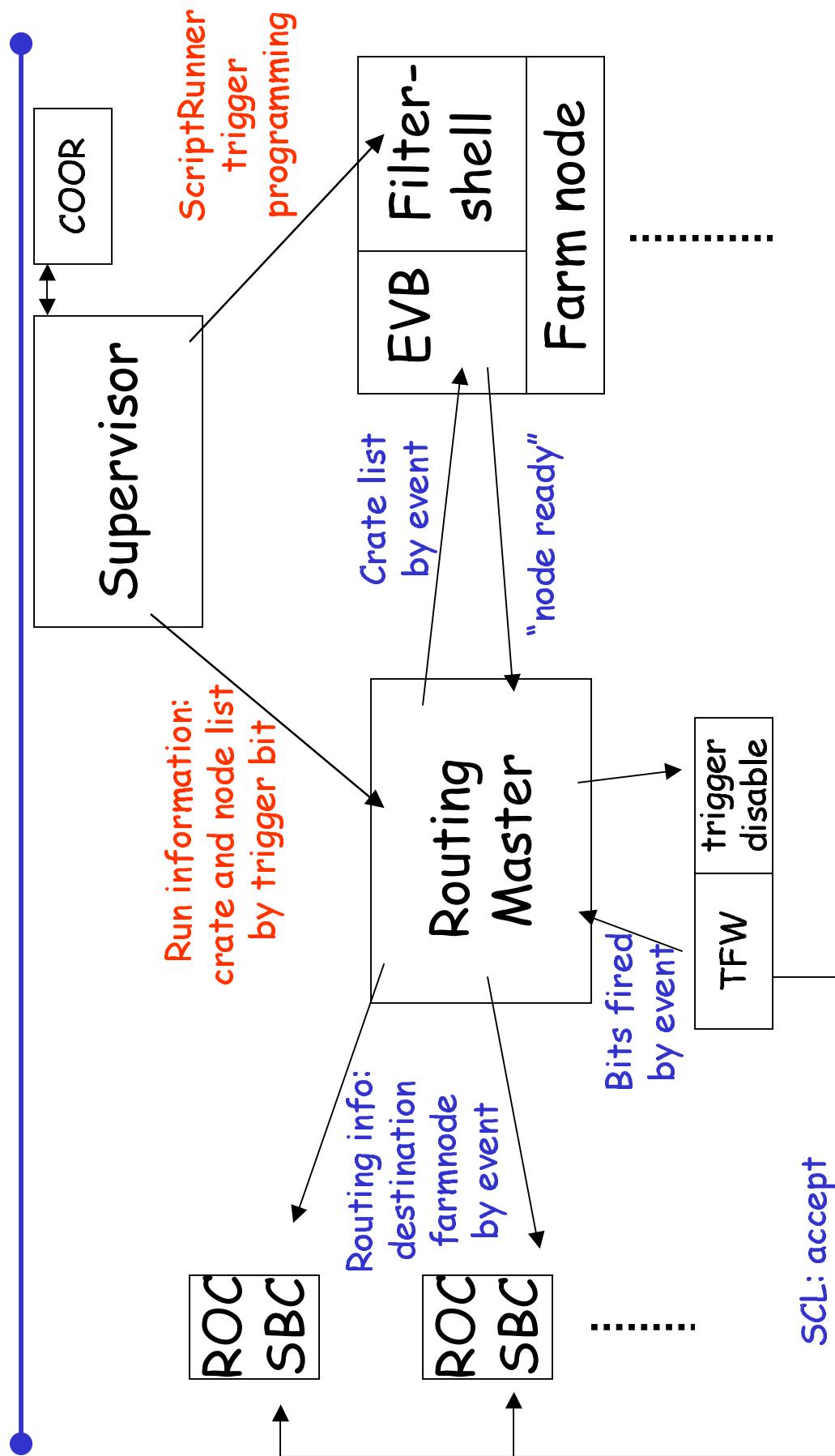
Farm Nodes

- Dual 1GHz Intel, 1GB RAM
 - 48 nodes so far
- Runs Event Builder (EVB) and Filtershell processes
- Filtershell
 - This is ScriptRunner (L3 filters)
 - Receives trigger programming info from supervisor
 - Receives full event from EVB process
- EVB Operation
 - **Connects to all SBCs, all the time**
 - Receive create list by event# from RM
 - Sends no. of free buffers to RM ("node ready")
 - Builds event from received fragments
 - No communication with supervisor

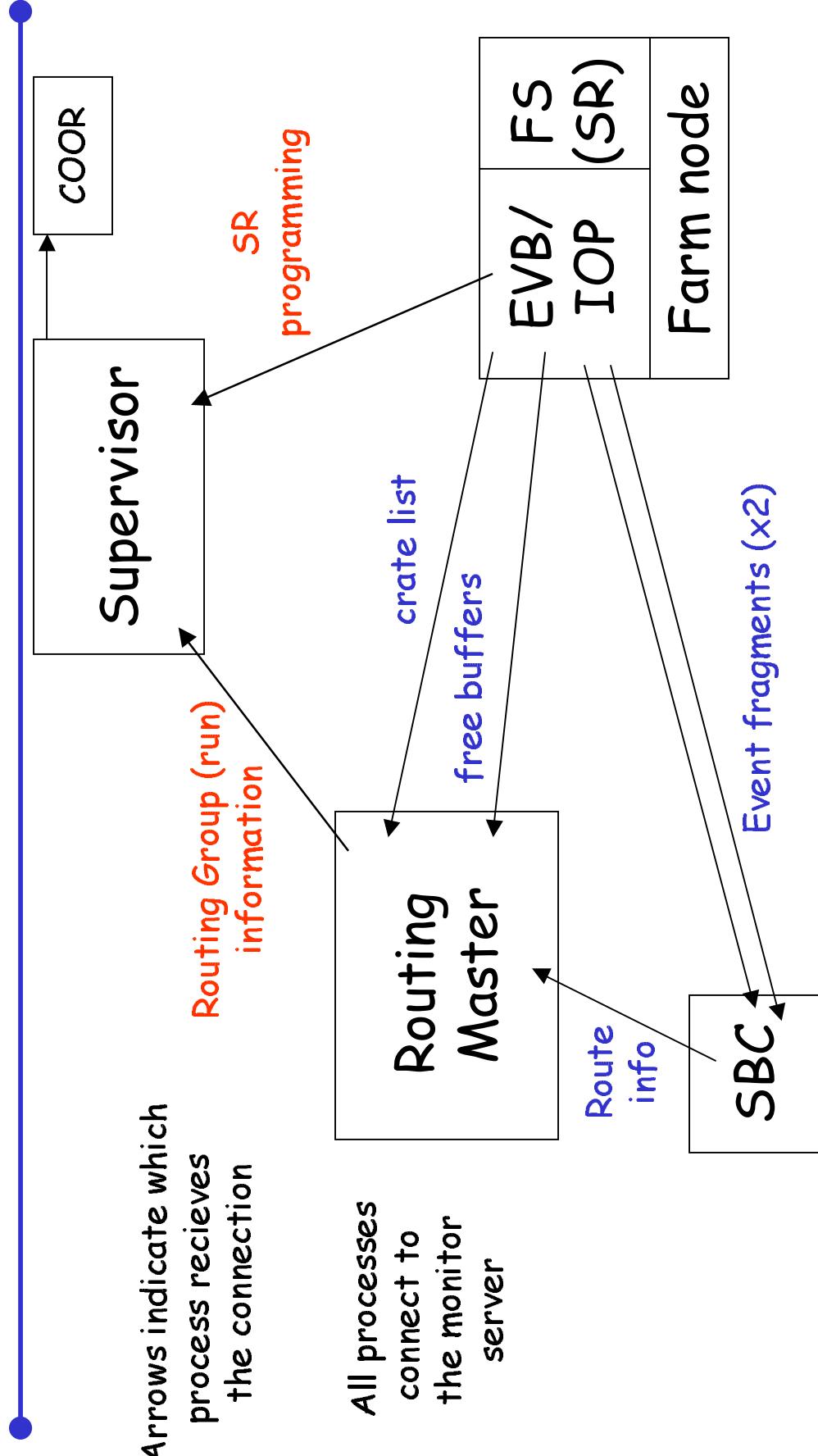
Routing Master (RM)

- 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



Socket Connections



L3 Trigger Crate

- TFW provides: (ECL lines)
 - Output from L3DAQ
 - 128 "disable" lines, one for each trigger bit
 - Input to L3DAQ
 - 16 bit L3 transfer number (event number)
 - 128 bit L1/L2 fired mask (which bits fired)
- Issue
 - Current L3 hardware only supports 32 bits in/out
- Under development
 - "L3 Trigger Crate" to house the RM and receive/control TFW ECL lines
 - Uses modified L1 Trigger hardware and an SBC
 - Near completion

L3 Disable: Interim Solution

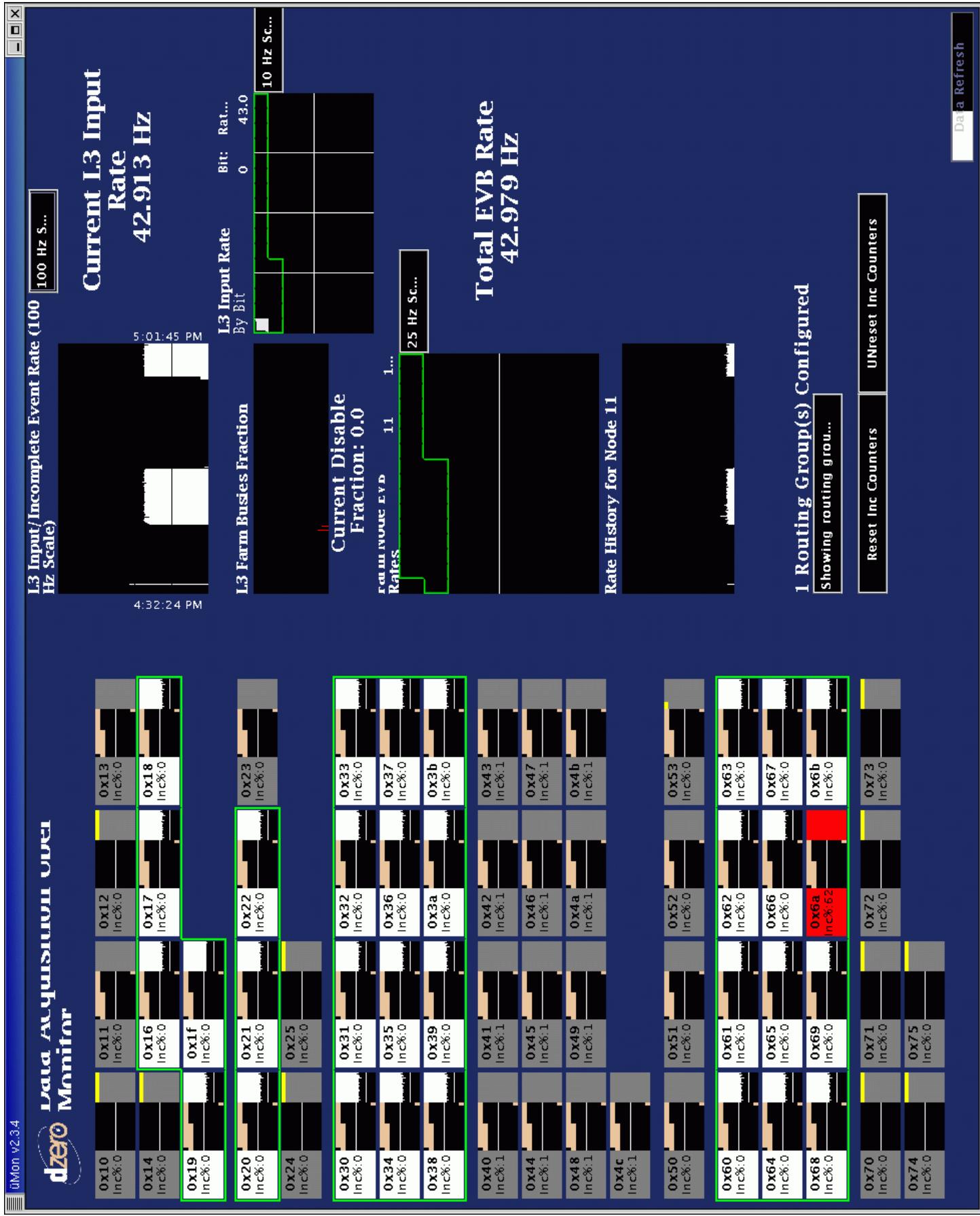
- RM process running on the TFW's readout crate SBC
- Spy on the TFW data block
 - Extract L1 fired bits and L3 transfer number
- When L3-disable is needed
 - Update RM monitoring information
 - RM tells SBC to stop reading out the TFW crate
 - TFW crate goes front-end-busy and stops triggers
 - Acts as global disable
- Cons
 - Actual L3 Disable line is not used
 - Cannot easily separate out l3daq backup (accounting issue)
 - Shifter must check L3DAQ monitoring every time TFW crate is 100% front-end-busy
 - Some L2 decisions can be ignored
 - Very rare, survivable, and accounted for

L3DAQ Shifter Webpage

- <http://www-d0ol/www/groups/l3daq/shifter>
- "What To Do When"
 - Extremely useful
 - Frequently updated
- On-call schedule
- Specific SBC instructions

Needed Improvements

- Consolidate monitor servers
 - l3xmon uses a different server
- Log file access by daqshifter
- Event/Route queue info in uMon
- l3xdaq_reset script will return
- Suggestions?



dzero Monitor

	Data Acquisition over	
0x10	0x11 Inc%:0	0x12 Inc%:0
0x14	0x16 Inc%:0	0x17 Inc%:0
0x19	0x1f Inc%:0	0x18 Inc%:0
0x20	0x21 Inc%:0	0x22 Inc%:0
0x24	0x25 Inc%:0	0x23 Inc%:0
0x30	0x31 Inc%:0	0x32 Inc%:0
0x34	0x35 Inc%:0	0x36 Inc%:0
0x38	0x39 Inc%:0	0x3a Inc%:0
0x40	0x41 Inc%:1	0x42 Inc%:1
0x44	0x45 Inc%:1	0x46 Inc%:1
0x48	0x49 Inc%:1	0x4a Inc%:1
0x4c		
0x50	0x51 Inc%:0	0x52 Inc%:0
0x60	0x61 Inc%:0	0x62 Inc%:0
0x64	0x65 Inc%:0	0x66 Inc%:0
0x68	0x69 Inc%:0	0x6a Inc%:75
0x70	0x71 Inc%:0	0x72 Inc%:0
0x74		0x75 Inc%:0

L3 Input/Incomplete Event Rate (100 Hz Scale)

Current L3 Input Rate
42.281 Hz



L3 Input Rate By Bit

Bit: Rat... 0 43.5
10 Hz Sc...

Current Disable Fraction: 0.0

Current Incomplete Event Rates

10 Hz Sc...

Current L3 Input Rate
42.281 Hz

Bit: Rat... 0 43.5
10 Hz Sc...

Total EVB Rate
43.128 Hz

Rate History for Node 2

1 Routing Group(s) Configured

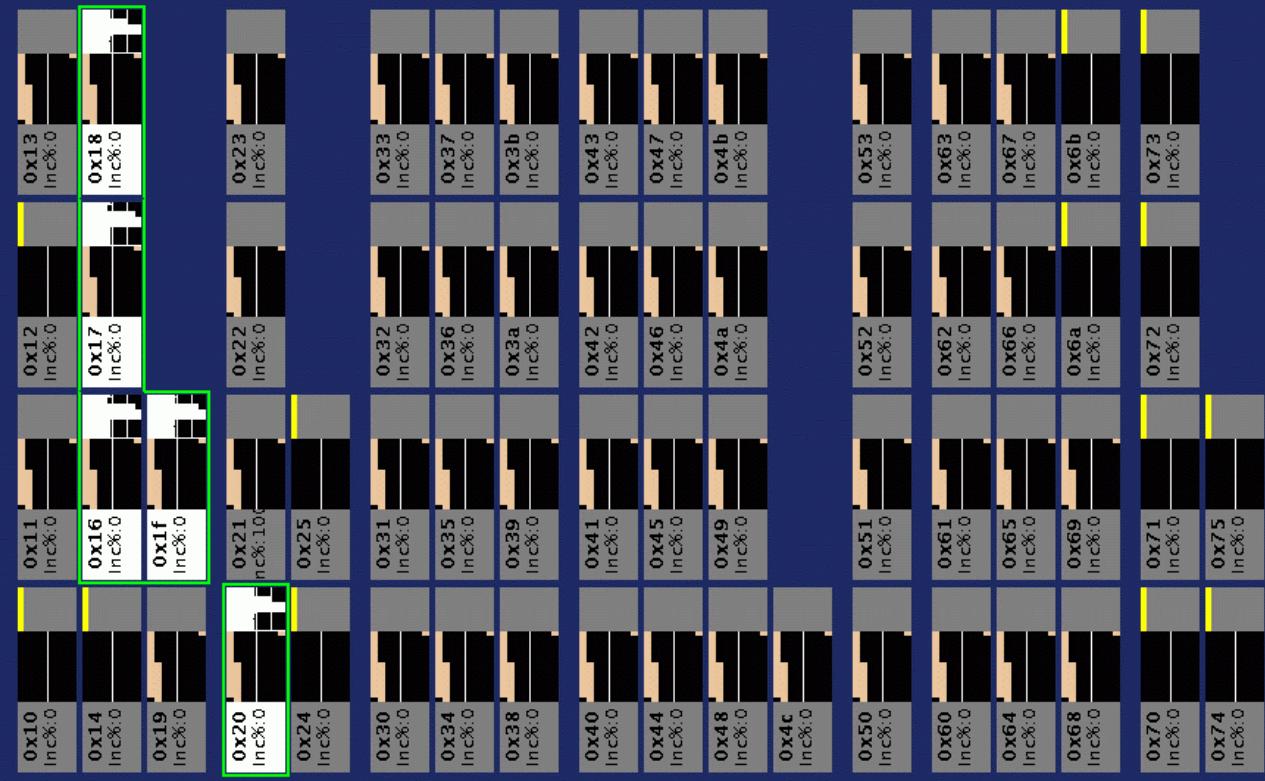
Showing routing grou...

Reset Inc Counters

Unreset Inc Counters

Data Refresh

dzero Monitor



L3 Input/Incomplete Event Rate (250 Hz Scale)

Current L3 Input Rate
133.597 Hz



Bit: Rat...
1 13...

250 Hz S...

Current Disable Fraction: 0.989

Rate Node EVD Rates

50 Hz Sc...

L3 Input Rate By Bit
1.3 Input Rate
Bit: Rat...
1 13...

250 Hz S...

Current L3 Input Rate
133.597 Hz

Bit: Rat...
1 13...

250 Hz S...

Total EVB Rate
133.89 Hz

Rate History for Node 24

1 Routing Group(s) Configured

Showing routing grou...

Reset Inc Counters

Unreset Inc Counters

Data Refresh

dzero Monitor

**L3 Input/Incomplete Event Rate (1
kHz Scale)**



**Current L3 Input
Rate
0.0 Hz**

**L3 Input Rate
By Bit**

1 kHz Sc...

L3 Farm Busies Fraction

**Current Disable
Fraction: 0.0**

L3 Input Rate (25 Hz Scale)

25 Hz Sc...

**Total EVB Rate
0.0 Hz**

Rate History for Node 48

0 Routing Group(s) Configured

No Routing Groups to...

Reset Int Counters

Unreset Inc Counters

Data Refresh

Typical Problems



- Prescales set for < 10Hz
 - Unpredictable results (all crates missing)
- Not enough nodes in run
 - L3 disables (TFW 100% FEB)
 - SMT/CFT/CAL in full-readout mode?
- Farinode loses connection to SBC
 - Crate is missing (reset farinode to fix)
- SBC doesn't seem to readout crate
 - Try redownloading the crate

Summary

- Transition system in place
 - Stable
 - Switchover smooth
- Final system installation begins in ~2 weeks
 - VBD replacement should be quick (<< month)
 - On schedule!
- Bottlenecks found
 - Expect L3 input rate increase to at least 500Hz in ~1 month