System Integration:
Progress and Timeline

Kristian Hahn, Paul Keener, Joe Kroll, Chris Neu, Fritz Stabenau,
Rick Van Berg, Daniel Whiteson, Peter Wittich
System & Context

Run2b L2 Trigger

Data

Data Loading

Decision Node

Decision Handshaking

Decisions
System & Context

Run2b
L2 Trigger

Data Loading
Decision Node
Decision Handshaking

Run Control
NodeMon
TriggerDB
ScalerMon

September 27, 2004
Daniel Whiteson/Penn
Decision & Control/Mon Node

Control/Mon Node

Offloads work from decision node

Keeps node simple

Buffers DAQ from node details
**Node Structure**

*Node code*

Three interlocking pieces
NodeAlgo has dedicated CPU
**RunControl**

**Communication**
- Configure
- Run
- HRR
- End

*Why is it critical to listen to RunControl?*

Must be in sync with data
- Configure brings trigger table information
- HRR tells us when data will cease
  - allows us to clear and recover
- End tells us to ignore data, prepare for configure
RunControl communication

Control & Monitoring node is a RunControl client
- Member of partition
- Listens & responds to transitions
- Tested in L2 torture and in beam
- No problems seen

Configuration information contains:
- Run Number
- Trigger Table
- L2 Tagset
- Prescales for each trigger
- Number of decision nodes
Why is it critical to monitor the node?
- Watch critical quantities
- An independent peek into processing
**NodeMon**

- **Data**
- **Decision Node**
- **Control & Monitoring**
- **Decisions**

**Monitoring watches**
- Event size
- Processing times
- Latencies
- *etc*

**Real beam data!**

- **Event Size [words]**
- **Time [sec]**

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September 27, 2004  
Daniel Whiteson/Penn
**TriggerDB & Trigger Tables**

![Control & Monitoring](Image)

**Requirements**
Specify trigger tables & tagsets

Archive tagsets

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**Run2a system**

*Trigger decisions completely specified by*

- Trigger table - cuts and logic
- Tagset - defines code used to implement decisions

**Defined via GUI**

- Trigger table defined & verified
- L2 Tags specified [ 3 cvs tags (alpha) ]
- L2 alpha executable built
- If successful, assign tagset number, store in DB
**TriggerDB & Trigger Tables**

**Requirements**
- Specify trigger tables & tagsets
- Archive tagsets

**Run2a + 2b system**

*Trigger decisions completely specified by*
- Trigger table - cuts and logic
- Tagset - defines code used to implement decisions

*Defined via GUI*
- Trigger table defined & verified
- L2 Tags specified [ 3 cvs tags (alpha) + 4 cvs tags(linux) ]
- L2 alpha executable built
- Linux code built
- If both successful, assign tagset number, store in DB
TriggerDB & Trigger tables

Transition from Run2a to Run2b

**Current:** 3 alpha tags specified
alpha build performed
tagset assigned if alpha successful

**Test:** 3 alpha tags + 4 linux tags specified
alpha + linux builds performed
tagset assigned if alpha successful

**Overlap:** 3 alpha tags + 4 linux tags specified
alpha + linux builds performed
tagset assigned if both successful

**Final:** Only 4 linux tags specified
Only linux build performed
tagset assigned if pulsar successful
**Trigger Table Definition**

### Procedure
- GUI specified trigger + tagsets
  - = cvs tags + header files
- Build performed on dedicated node
- Build named by trigger + tagset
- Control node has access via mounted disk

*Interfaces designed, implementation underway*

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**CVS**

- **Common Disk**
- **Build Node**
- **Control & Monitoring**
- **Decision Node**

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**TriggerTable GUI**
Trigger Table Loading

**Procedure**
RunControl specifies trigger+tagset
Control node looks for built code
Makes appropriate library available
Instructs decision node
Decision node dynamically loads trigger functions

Interfaces designed & implemented
preliminary testing underway
ScalerMon has two important interactions:

**Mid-run prescaling**
Allows shifter to modify prescales during run

**Scaler counting**
Receives mon info regarding scalers
Mid-run prescaling

**Interface**
Using the ScalerMon GUI, the shifter can modify any of the L2 prescales

**Implementation**
Control Node extended to be a ScalerMon subscriber [via SmartSockets]
Listens for prescale-change messages.
Issues instructions to decision node.

*Interfaces designed & implemented. Preliminary testing done.*
ScalerMon

Scaler counting is done in the node
Counts are stored in TL2D
Passed along to L2TS

Run2a system uses crate controller to pull scaler info out of alpha
to send to ScalerMon

Run2b system can modify to read from L2TS, send to ScalerMon
**TL2D**

- Run2a system builds TL2D with block=0

- Run2b will write TL2D with block=1
  - Allows us to read out both systems at once
  - Easy to transition to Run2b system
Nodes

• Total of four nodes needed:
  – Two decision nodes [ 1 is spare ]
    • AMD, fastest available
  – Build node
    • Same architecture as decision nodes
      – Can use retired decision node
  – Control/Mon node
    • Bob Blair donated machine

• Nodes to purchase: 2 decision nodes
Summary

- Control & Monitoring infrastructure in place
  - RunControl interface: finished & tested
  - NodeMon interface: finished, needs more testing
  - TriggerDB interface: designed, partially implemented
  - ScalerMon interface: designed, partially implemented
# Schedule & Manpower

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<tr>
<th>Task</th>
<th>People</th>
<th>Schedule</th>
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