Pulsar/SVT

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Intro

• Few slides:
  - Base ideas
  - Want to discuss and get feedback

• Pulsar:
  - Already “SVT-compliant”
  - Lots of logic, connectivity and memory

• Two problems:
  - More versatile RoadGhostBusting
  - Possible replacement for aged/less flexible components
Three Scenarios...

• Minimal (RGB):
  • Just replace RoadGhostBuster with something more powerful

• Intermediate (HB+RGB):
  • RGB already requires some duplication of HB logic
  • HB is “slow” and “old”

• Ludicrous (AMS+HB+RGB):
  • AMS could use some more spares
  • It would be nice to make all the SVT boards aware of a little more of what’s happening around (CDF signals/L1)
Is it powerful enough?

Let’s take the most complicated scenario: AMS+HB+RGB

• AMS+Glue on the P3 end
• HB+RGB on one of the other two

- SVT I/O handling
- Logic flexibility
- IO Lines widths/interconnection
- P3 Pinout

Memory?
Data Flow & Memories...

SS#27
- Hit 0
- Hit n
- 01...010

SS#42
- Hit 0
- Hit n
- 01...001

00...110 reads:
This SS is being used in the 2nd and 3rd patterns seen in this event (bits 1 and 2 are set to 1)
Poor Man’s Road Busting

Road# 21466

- SS#27: Hit 0 ; Hit n 01…010
- SS#32: Hit 0 ; Hit n 00…010
- SS#58: Hit 0 ; Hit n 01…010
- SS#69: Hit 0 ; Hit n 01…010

..00…010

Road is busted!
Memory?

• Bad news:
  • not enough in current design

• Need a lot:

<table>
<thead>
<tr>
<th>Component</th>
<th>Size</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS Map (hits→SS)</td>
<td>128Kx16</td>
<td>4Mb</td>
</tr>
<tr>
<td>AM Map (roads→SS)</td>
<td>1Mx16</td>
<td>16Mb</td>
</tr>
<tr>
<td>HLM</td>
<td>64Kx24</td>
<td>6Mb</td>
</tr>
<tr>
<td>GhostBusting “flags”</td>
<td>64Kx72</td>
<td>18Mb</td>
</tr>
<tr>
<td>Spy</td>
<td>128Kx24x2</td>
<td>24Mb</td>
</tr>
</tbody>
</table>

• Good news:
  • “Open design” with lot of I/O towards mezzanine cards (4)
  • Static ram is extremely cheap! $O(10$/16Mb)
Conclusions

• Pulsar is extremely versatile
• Can follow SVT evolution
• Could be introduced gradually (I.e. RGB only first)
• Even AMS+HB+RGB seems feasible
• Little hardware work required
• Need a lot of feedback/suggestions