Alpha Firmware Tests

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October 4, 2002
Trigger Hardware Meeting
PIO Firmware

- Firmware for reading Reces
  - Can also be used for alpha to alpha communication
- Designed by Rick Kwarciany (Fermilab)
- Current design allows for 32 and 64 bit PCI transactions
- Using 64 bit burst transactions, all of Reces can be read in about 13us
  - Old style takes 48us
- Have occasionally noticed a problem when PCI and MBus hang
  - For some reason no Reces board responded on the backplane
- A newer design will timeout if a board doesn’t respond.
  - Still need to test this
  - Plan to test during beam studies and eventually put into system
    - Requires configuration write to enable timeout feature and set the timeout time
Pipeline Fpga

- Control of MBus loading now in firmware
- Reduces number of PCI reads/writes required by software
  - Saves a few us per event
- Allows startload to be sent whenever L1A arrives
  - Better pipelining performance
  - Versus waiting to get to that point in code loop
- Backend of L2-TS handshake put in firmware. Saves about 2us
- Tests were done without any errors.
- New code written to use fpga and has been tested
Tests

– Run 152137 tested new firmware with beam
  • But no SVX
– Ran for an hour at L1A rate of 3.6Khz
  • Had 1.2 seconds of deadtime
– TrigMon and Trigger rates looked good

– Code and firmware tested yesterday without beam

– Plan to test with beam and SVX today.
  • If beam test is successful then will become default
– Need to make new tagsets for cosmics runs
Other news

- **DCAS Monitoring**
  - Rare DCAS error where tower usage bits are wrong although clustering in TL2D correct based on actual energy data. However shows up as Clist error in TrigMon.
  - Monica working to put DCAS monitoring into Trigmon
- **DCAS backplane**
  - Still need to replace DCAS backplane in crate with errors.
  - Monica will be on shift for a week starting next Friday (?)
- **Isolist pass 1**
  - Test of hardware shows that Isolist correctly sends just pass 1 clusters
  - TrigMon code has been fixed to account for this.
  - Will become the default shortly
- **VME readout**
  - Code kludge by Arnd for Block Transfers didn’t work
  - Will need a blue wire plus firmware change to use VME BLT readout
  - Plan to reduce TL2D size using Readout Lists
    - will save about 2Kbytes per event (most of the bank)
    - This will solve the problem of L2 readout time being too long