

# EUDAQ

JRA1 DAQ Status

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# Outline

- VME Speed
- Mimosa18
- Final chip
- TLU
- Other Issues
- Conclusions



# VME Speed...

- Last year speed improvements were implemented in the DAQ and tested in lab
  - Only two boards, with no sensors attached
  - Predicted speed for full telescope was  $\approx 400$  Hz
- Recently tested with actual setup
  - Actual speed was  $\approx 200$  Hz, but  $\approx 6$ KB per sensor
  - Reducing data to minimum (just header & trailer) maximum speed was 320 Hz



## ...VME Speed

### Observations:

- MBLT bandwidth is well below theoretical value (expect 80 MB/s, measure ~25 MB/s only)
- Angelo has also performance problems with 2eSST, related to a driver bug
- Further investigation to understand difference:
- Implement new kernel/driver combination



# VME Speed: next steps

- Double buffering on EUDRB
  - Would allow new trigger as soon as event is in FIFO, before it is read by VME (for all chips)
- Faster VME transfer mode
  - 2eSST instead of MBLT (for Mi26 only)
- New Driver?
- May split the EUDRBs for maximum speed onto 2 VME crates



# Mimosa18

- Pedestal uploading for Mimosa18 has been implemented at DESY
  - Address encoding matches decoding, but needs thorough testing with real data (or source and mask)
  - Testing could be done with a source+mask and a Mimosa 18 in a Maserbox



# Steps for final chip

- Implementation of the new protocol to the EUDRBProducer
- Encoding/Decoding of the data in the DataCollector/RootMonitor
- Propose to do first 'real' testing in Ferrara
- Would need a Mi26 in a Maserbox for Geneva



# TLU

- Software has been updated for new TLU (v0.2)
  - Automatically detects TLU version and loads correct firmware
  - Basic functionality (like TLU v0.1) is working
- Switching between LEMO / RJ45 needs testing
  - NIM connectors seem to work
  - Possible problem with TTL, but maybe only on TLU v0.2a (with programmable levels/termination)





# TLU

- JRA2 has problems reading out Timestamps (USB-Blocktransfer)
  - nearly blocks their DAQ completely
  - seems to be machine dependent
  - We could somehow reproduce the problem, but our performances is nearly not affected
  - Temporary fix: Do not read timestamps
  - Maybe USB-bus underpowered, proposed to use a powered USB-hub, waiting for answers



# Other Issues

- Compatibility with 64-bit Linux
  - Several issues fixed, one user has a working system
  - Another user has reported problems – need investigating
- Decoder plugin framework for DUTs
  - Under development with Martin Killenberg
- Slight change in native file format planned
  - Will speed up reading, when events are skipped
  - Will not affect users (as long as they use the EUDAQ library when reading native files)



# Other Issues

- RootMonitor needs some rework:
  - Speed is far too slow to follow new data rates, even scaled
  - New native file format may help
  - Attach directly to a I/O stream instead of reading from file?



# Conclusions

- Readout speed has been improved, but more work needed
- Can now load Mimosa18 pedestals
- Compatibility with TLU v0.2 almost there
- Compatibility with 64-bit Linux coming
- Demonstrator currently running at DESY with latest changes
- New decoder framework in development
- Faster native file reading planned

