CMX
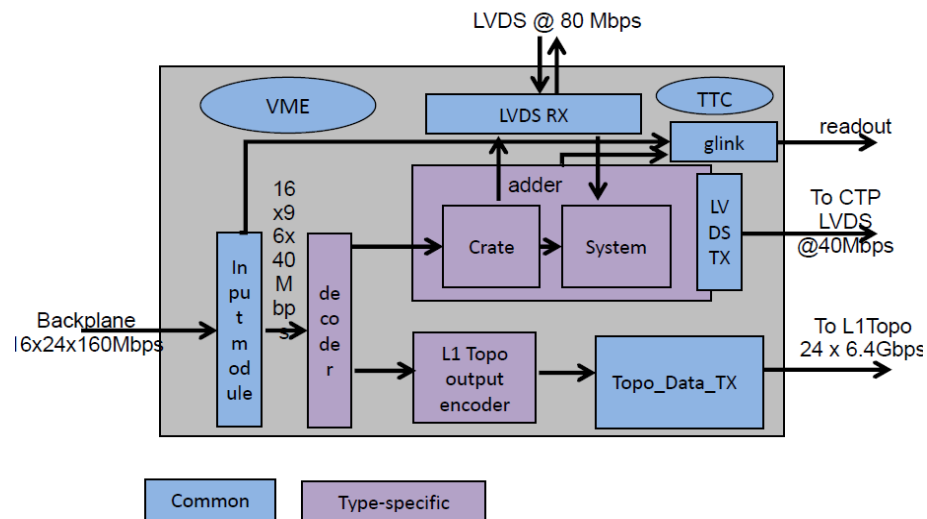# – Firmware and comissioning

W. Fedorko on behalf of the CMX team

Firmware functionality

- Modular structure to support 3(jet,energy,em)x2(crate,system) flavors

- Work on-going for the Jet and SumET

- CP work starting this week

M5 status: Jet

- Backplane capture: additional register due to large skew on inputs

- CTP RT path simulation and debugging

  - VHDL TB

  - CTP output SPY memories

- Crate-system integration:

  - RTM capture on the 'system' side

  - Input spy memories (enable DS2 phase calibration)

  - Programmable pipeline

    - Measured crate-system latency at 4BC

      - Can save 1BC in logic, probably 1 BC in DS2 setting.

- Readout: 1 slice tested at 105 kHz in M4

- CTP integration:

  - Single fixed threshold (J10)

  - Measured latency wrt tau8 trigger (+8BC)

  - Removed pipeline delay, confirmed valid triggers from 'system' using readout data

Tau8   J10
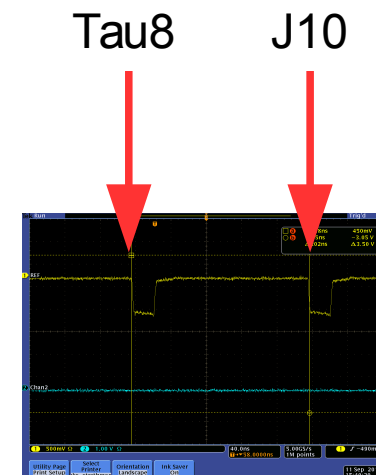
Jet/Common FW ongoing work

- CTP data path latency reduction (5-6BC achieved)

- +Full thresholding

    – Done needs TB and HW tests

- RTM 'crate' output spy memories

- Topo TX

    – FW module tested with topo previously with 'dummy' data

    – Needs re-integration

- Target: M6

Missing features

- RTM masks

- Readout

  - Full data + pipelines (currently only backplane data)

  - 3,5 slice

    - Ready but untested

- Parity error handling

  - Programmable trigger force/kill

  - Topo output suppress/flag (?)

- Rate metering

- Target M7

  - Readout sooner if possible

M6 plans

- CP:

    - Conversion of Jet decoder/adder to CP

        - Most likely no Topo output from CP

        - Most likely simplified thresholding

    - First tests with CPMs in the testrig done

        - 160 Mbps 'physics' data received, but not understood

    - Four 'Tau' CMXs deployed in USA15

    - Hope to deploy Four 'e/gamma' CMXs during M6

- SumET:

    - 'logic' code under development on-going

    - Integration with interfaces planned for Oct 6-10.

    - Hope for SumET triggers in M6

    - Most likely no Topo output

    - Hardware deployed

'Externals'

- Code management:
    - Contemplating moving to git
        - Consistent directory structure irrespective of working tag/branch
        - Easier to collaborate across the globe
            - Mirrors
            - Local repos
        - Fast!
        - CERN now can host git repos
    - Need to develop tag and build tools
- Design partitioning
    - Preserve synthesis and implementation for portions of the design
        - Close timing once!
        - Decrease build time
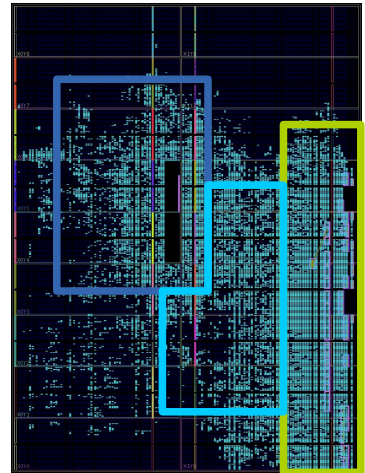
CAN bus (Yuri)

- CMM/CMX DCS interface similarities and difference:

    - CMX and CMM use CANBus uProc MB90F594A

    - Temperature, voltage and current measurements are implemented with the same components as on the CMM,

    - CMX monitors 20 parameter CMM 8

- Current status (with the help from Paul Thompson and Bruce Barnett):

    - Information from LevelOneCaloTriggerCAN Twiki page

    - Softtune Workbench software installed,

    - L1C_CANOpen CMM software built.

- Next steps:

    - looking into CANbus code - how it is organized and works, what to modify

    - common session with Paul is planned during the week starting 6th October…

Conclusions and outlook

- Jet CTP real time path exercised in M5

    - Improvements ready for testing this week

- Jet Topo TX integration planned for this week

- CP on track for prototype deployment in M6

- Missing common features development in parallel to CP development