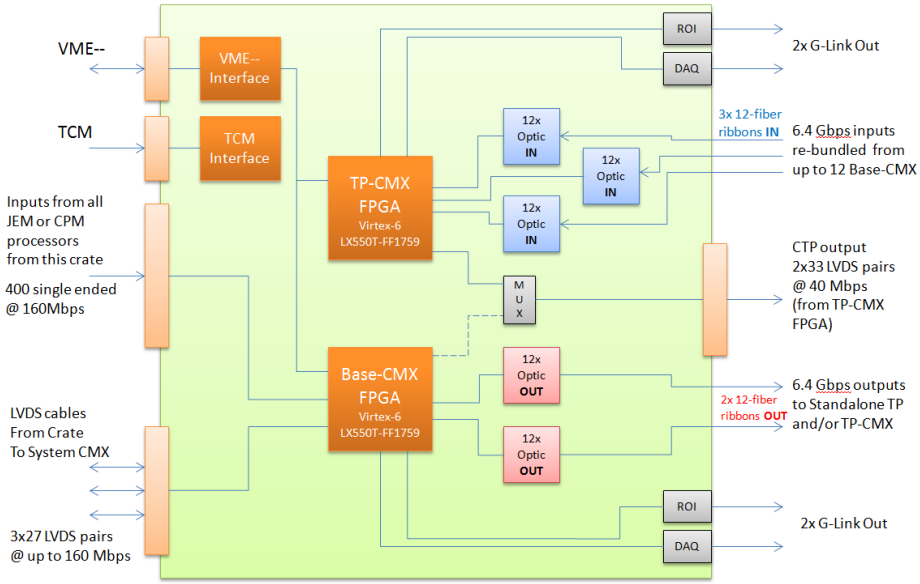
Atlas L1Calo CMX Card

CMX is upgrade of CMM with higher capacity

1) Inputs from JEM or CPM modules
   - 40 → 160Mbps (400 signals)
2) Crate CMX to System CMX Cable IO
   - 40 → 160Mbps (81 signals)
3) Output to CTP
   - 40 → 80Mbps (66 signals)
4) Bigger FPGA (Xilinx Virtex 6 VLX550T)
   - e.g. for additional thresholds



Functionality new to CMX

1) Cluster information sent by each CMX to Topological Processor
   - Two 12-fiber ribbons of optical output @6.4Gbps per fiber
2) Optional partial TP capability included
   - A Standalone TP is being built but some TP capability is still desirable on the CMX platform
   - Three 12-fiber ribbons of optical input at @6.4Gbps per fiber
   - Separate Virtex 6 FPGA used for TP Functionality (optionally installed)
     - Most CMX cards will be built without the TP FPGA installed

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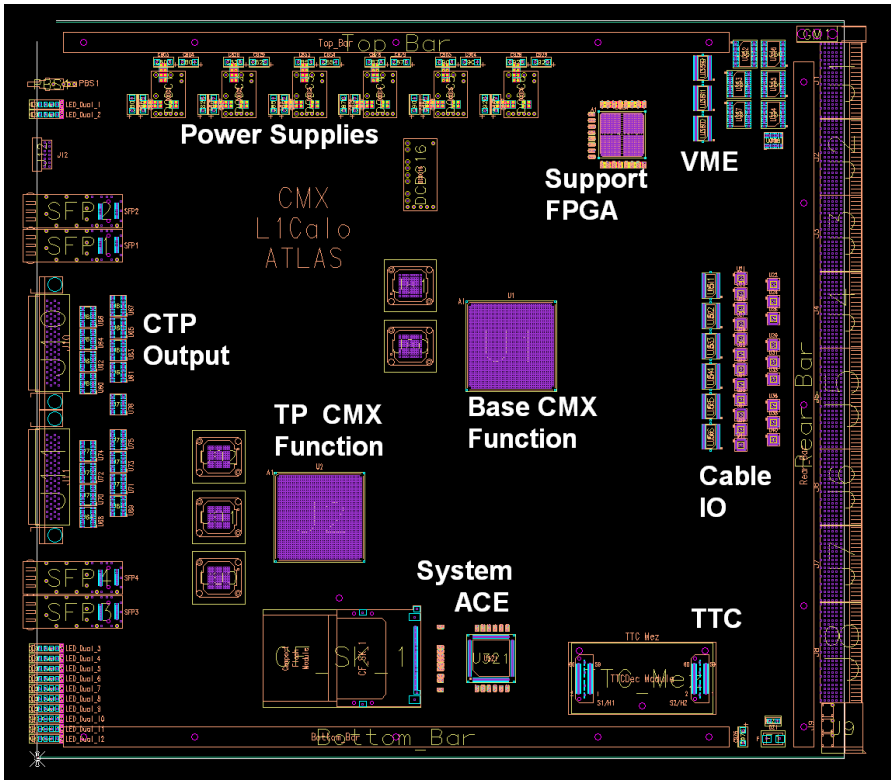
Main Data Path

- Backplane Inputs, Cable IO and CTP Output all understood
  - Maximized signal integrity
    - Critical for 160Mbps bandwidth
    - All critical signals between ground planes
    - PCB trace layout optimized (no extra vias)
    - Pin assigment verified for firmware routability
    - 24-layer card
- Working on details of Optical IO



Ancillary Functions

- Understanding Power issues
  - Sizing power supplies
  - Need to satisfy firmware requirements
  - Investigating FPGA heat dissipation
- Working on Clock Distribution
  - All clocks and IOs are synchronized to TTC
- Optimizing overall parts placement

Atlas L1Calo CMX Card

VAT card: parallel effort and study platform

- VME/ACE/TTC (**VAT**) ancillary functions of CMX
- Redesign of CMM with new components
  - Most ancillary functions fit in single Support FPGA
- Build a **6U VME test card**
  - Include a small Virtex 6
  - Practice firmware configuration via System ACE
  - Test bed of operating environment for CMX
  - Can start design of CMX control Software
  - Lessons and details to be merged into CMX
- PCB done June 2012
- Currently working on
  - Firmware for VAT card
  - Test Firmware for Virtex 6 FPGA
  - Test Stand and software