

# Strategy for unified data link

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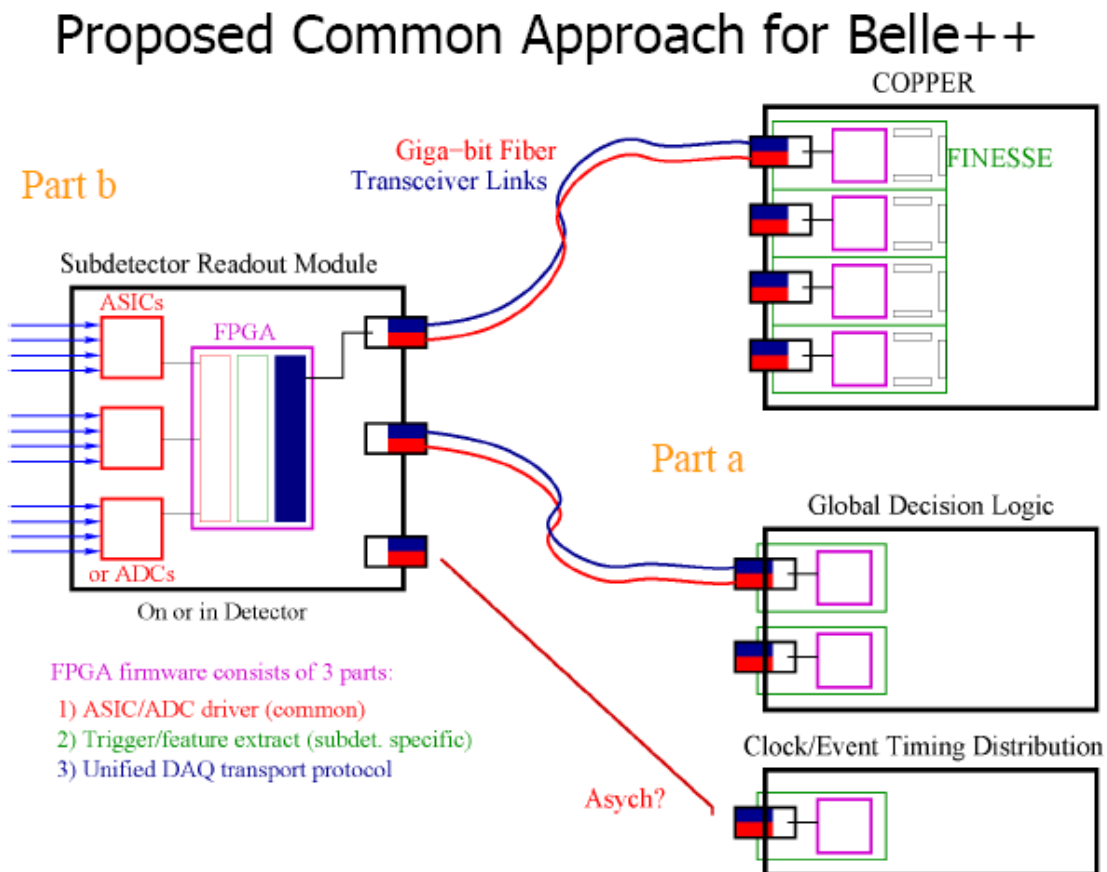
Institute of High Energy Physics

# New Ideas on Belle II DAQ

- Consideration Base

- HS data transmission
- Optical link
- Unified Readout
- Unified Data link
- Also trigger?
- Also timing?

- My talk on PMC/COPPER link



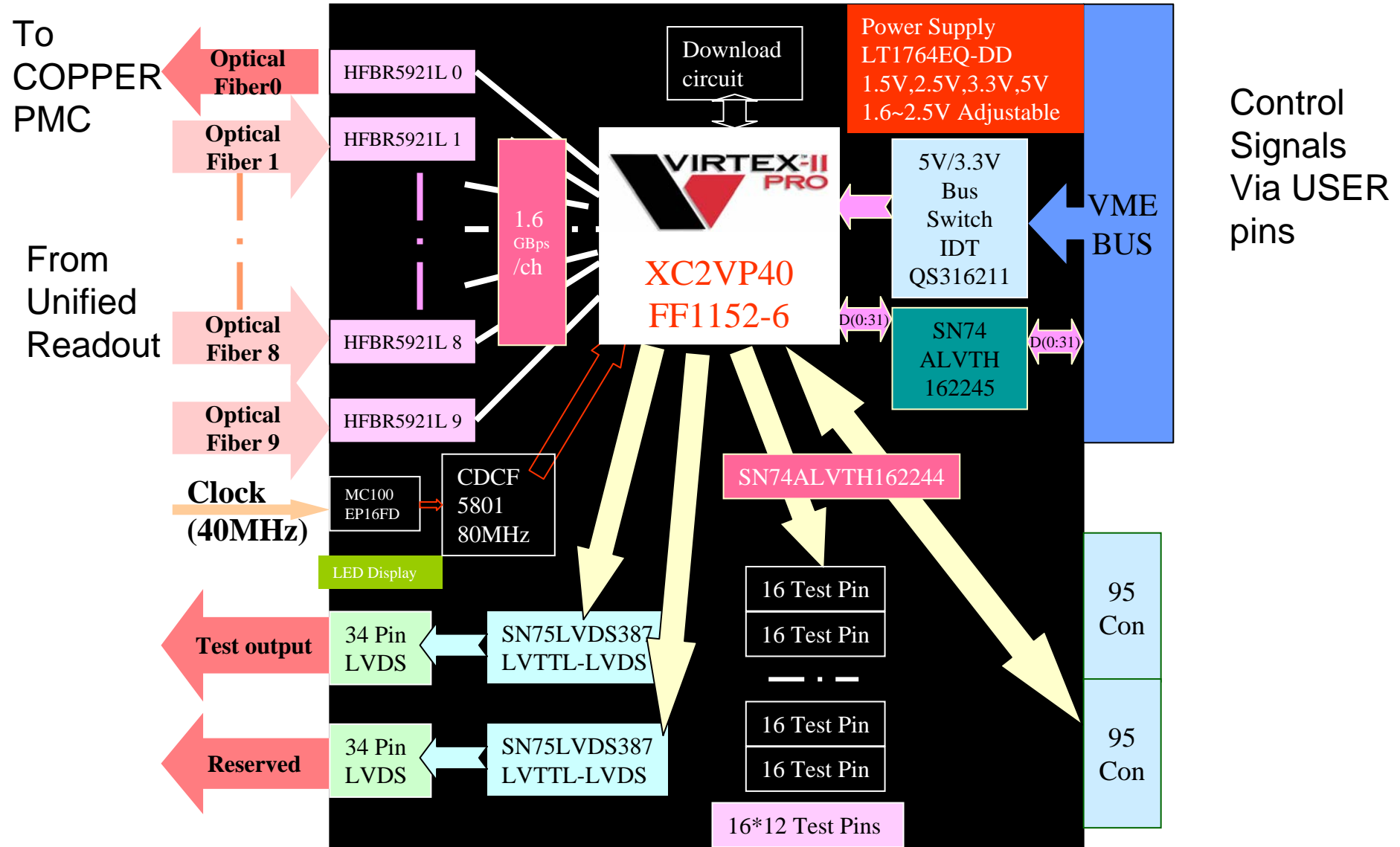
# Trigger path suggestion to Iwasaki-san

- If HS data link used
  - RocketIO (SEDES)
  - Synchronization needed (per channel)
  - Channel Alignment needed (per system)
  - Pipelined processing
- Trigger latency should reserve big enough
  - 5 us maybe enough but conservative
  - 7 us in BESIII
- Trigger distribution
  - More time needed

# Scheme1 for Data link (to Copper)

- Based on discussions two schemes in consideration
- Scheme 1
  - Detector specific readout( Gary's board or other?)
    - 16 ch/optical line
    - Data preprocessing
    - Partial packaging
    - Data frame/protocol
    - Length/ch/event?
    - Trigger L1 driven
  - Data merger
    - Further packaging
    - Necessary to save COPPER boards
    - Output to COPPER PMC
    - Data frame2
  - PMC
    - Data mover to CPU on COPPER

# Merger test module

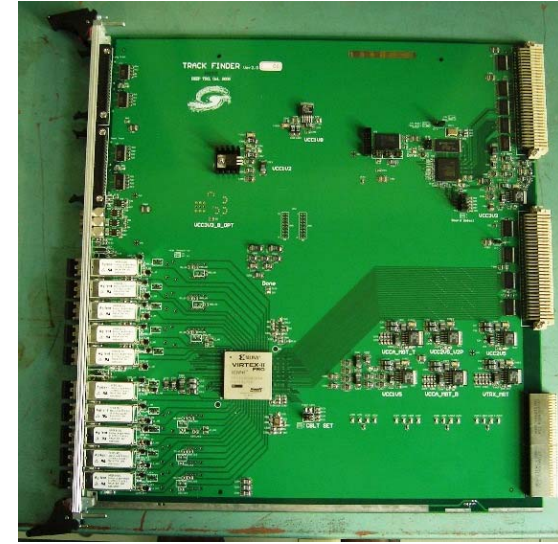


# To be decided with Scheme 1

- Clock for HS transmission
- System clock
- How many input ch / board?
  - Data rate
  - Data size
- VirtexII Pro / VirtexV ?
- Synch/Asynch?
  - Synchronized data transmission.
- Data frame

# Status

- Hardware available
  - Data source
  - Merger board
  - Test system available
- Protocol
  - Need FRST, Tsync signals from timing sys.
  - Need more discussion with timing/readout/COPPER people
- PMC to be designed



# Scheme2 for Data link

- In scheme 1:
  - Optical transceiver inside detector( say CDC)
  - Question:
    - Reliability not so good in BESIII
      - Radiation? Experiment did before design
      - ESD effect? Experiments under taken
      - Unclear yet!
    - Stop machine for replacement?
    - Open the Detector for replacement?
  - Possible solution
    - Optical transceiver outside detector
    - Merger before HS data link



# Scheme2 for Data link

- Scheme 2
  - Merger near detector
  - Electrical to FEE
  - Optical to PMC/COPPER
  - Easy maintenance
  - SFP transceiver



# More discussion scheduled

- A discussion is scheduled tomorrow
- Idea from detector and FEE welcome