Data links, protocols, data format

Development of FE's, DAQ's and TDS's modules requires interface standardization !!
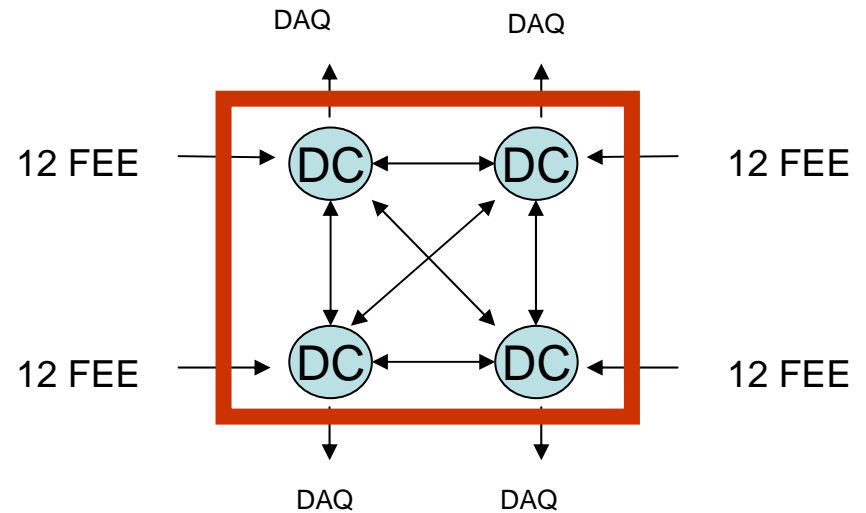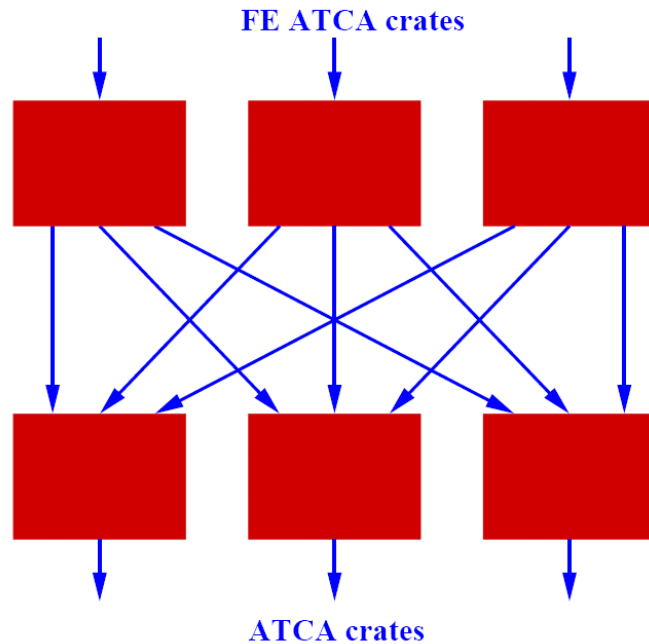
Physical layer
- electrical/mechanical standard
- media
    - fibre – speed, wafelength
    - copper – speed

Data Link layer
- protocol

Data format

PANDA DAQ

FE ATCA crates

ATCA crates

DAQ · DAQ

12 FEE → DC ↔ DC ← 12 FEE

12 FEE → DC ↔ DC ← 12 FEE

DAQ · DAQ

Interfaces:

- FE interfaces   media   - fibre

- Between CNs inside crate   - copper

- Between modules outside crates   - fibre or copper

Functionality :

Data transmission, Slow Control, TDS

Data transmission

Data transmission

Physical layer

Fibre options
- wave length
  - 1300 nm - 1000Base-lx, FC, SONET
  - 850 nm - 1000Base-sx
- speed
  - 1.25 ÷ 10 Gb/s
- packages
  - SFP
  - SFF 2x5, 2x10

Copper inside crate
- 2/4 pair implementation

Copper outside crate

Proposal:
    Fibre – SFP
    Copper inside crate – Wolfgang provides ATCA specification

Protocol :
- Ethernet frame only
- data flow control - XOFF for data flow control

Data header:
- source ID
- size
- error correction code
- processing level

FE interface

Front-end interface is shared by:
- data   - Ethernet frame
- slow control   - Ethernet frame
- Time Distribution   - Single word

Inclusion of TDS word :
- Ethernet frame comma
- TDS word is included in Ethernet frame surrounded by comma characters