

Survey for future bus for CO/FE Front End Computers

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Definition

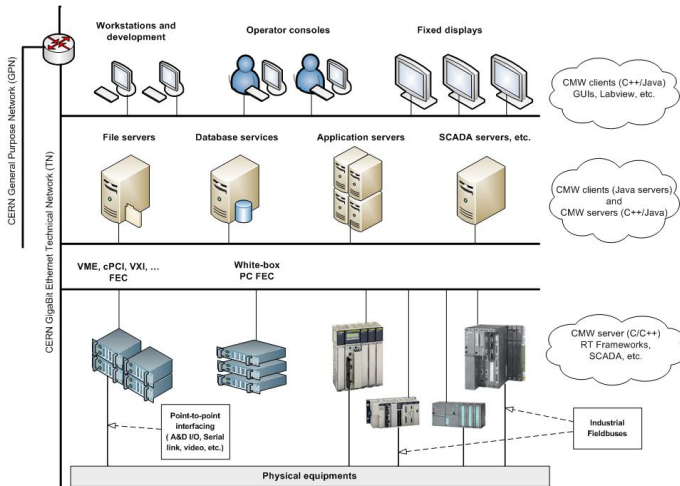
FEC — Front End Computer

- Over 1000 FECs for control of all accelerators.
- There are many different buses currently used at CERN:
 - VME64x*, VXI*, VXS,
 - cPCI*, PXI,
 - μ TCA, ATCA,
 - Industrial PCs*.
- VME standards are becoming obsolete,
- Migration from PPC to Intel CPUs,
- CLIC project needs a FEC standard to be chosen,
- White Rabbit will be ready soon,

*Used as a FECs



Current CO infrastructure



Definition

RAS — Reliability, Availability, Serviceability

RAS requirements:

- remote management over Ethernet:
 - monitor: voltage/current, temp., power and fan status,
 - control: fan speed, CPU reset, power on/off.
- highly modular design (reduced repair time),
- redundant power supply,
- support for RTM (Rear Transition Module),
- clock lines and trigger lines (White Rabbit?),
- service units (power, fanout, LED panels) and sockets (power, Ethernet, Terminal) accessibility.



It would be nice to have...

These are not actual requirements but we would like to have those:

- multiple fast serial links (to hub and/or adjacent slots) supporting Gigabit Ethernet and/or PCI Express and/or other differential buses,
- hot-swap for power supply and cooling units,



Other requirements

Other requirements:

- supported by multiple companies,
- based on commonly used standards,
- modules available off the shelf:
 - digital and analogue I/Os,
 - fast digitizers/oscilloscopes,
 - waveform generators,
 - serial interfaces (RS232, RS485, CAN, ...),
- standardized connectors/backplane layout,
- cost effective.



Possible choices?

There are several standards we may choose from:

- VME64x, VXI – Old, almost obsolete standard,
- VXS – VME with serial links extensions,
- VPX – Complete serial-based standard from creators of VME,
- PXI – One CPU per crate, still PCI bus, depends on NI,
- PXI-serial – One CPU per crate, PCI dropped for PCI-Express,
- ATCA – Serial links and redundancy but quit complicated, created for telecom companies,
- μ TCA – Smaller version of ATCA, not many AMCs for Physics.



Thank you for your attention.

Questions?

