Control Systems, Network and Computers

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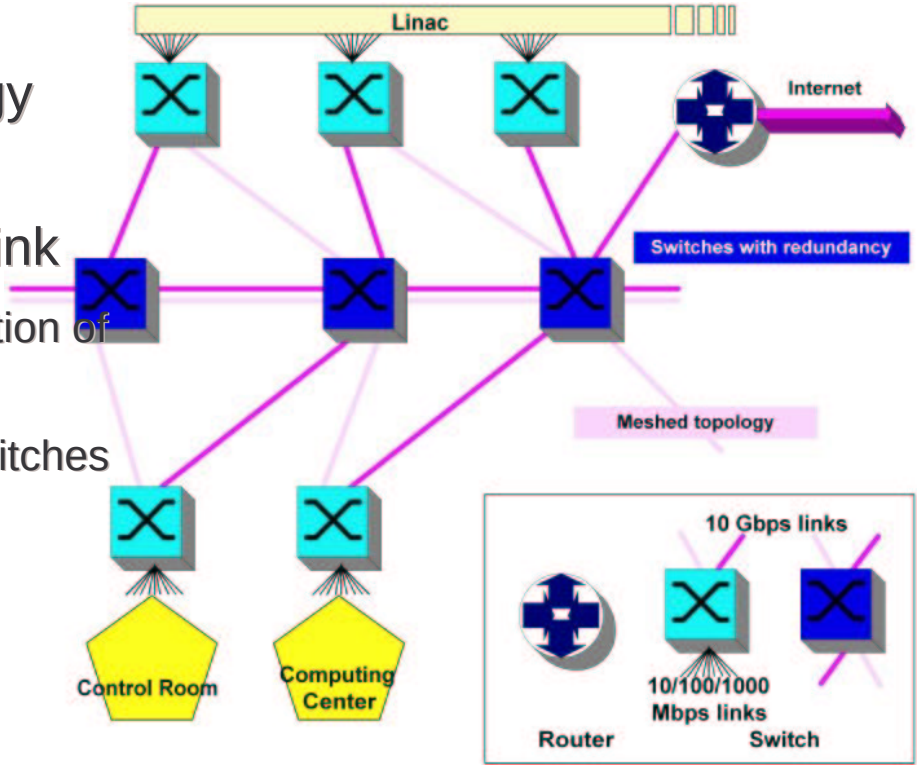
Major Guidelines

- Whenever possible, use of commercially available solutions
- Use of recognized standards for hardware and software (bus, network, OS)
- Preference given to solutions already present in the accelerator domain (control software)
- Try to adopt (or adapt) complex systems already developed for similar needs (RF control, timing system, diagnostics interfaces and signal processing, acquisition software …)

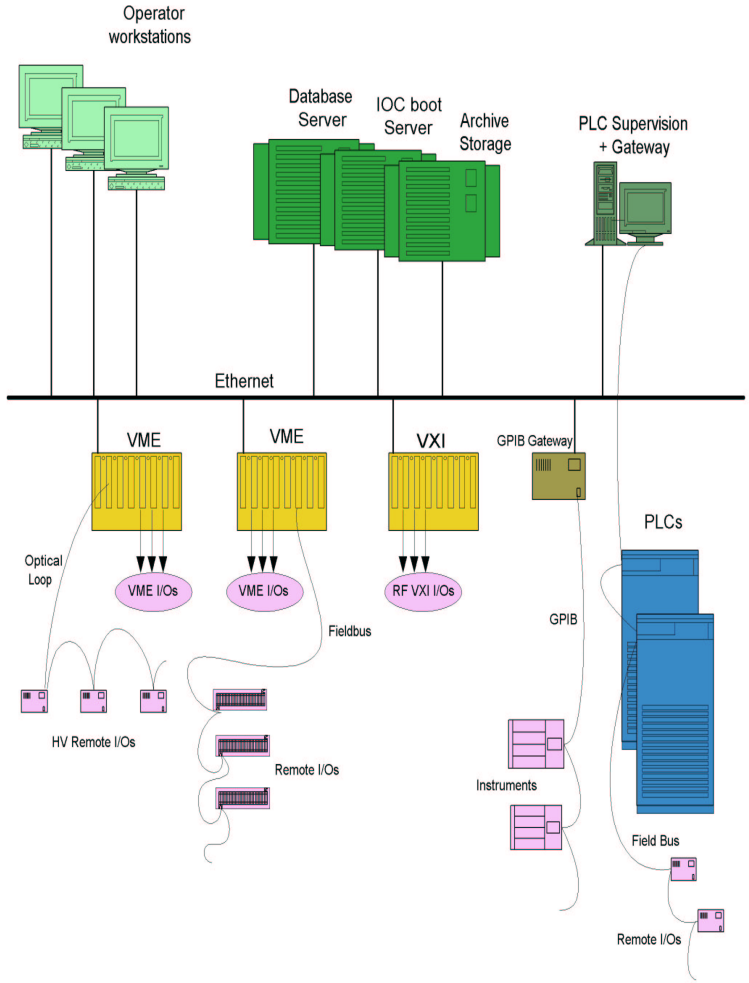
Network

- Switched Ethernet technology
- 1/ 10 Gbps backbone
- 10 / 100 Mbps switch-node link
- Performance : VLANS (insulation of traffics)
- Availability : redundancy (switches and optical fiber)
- 2440 nodes



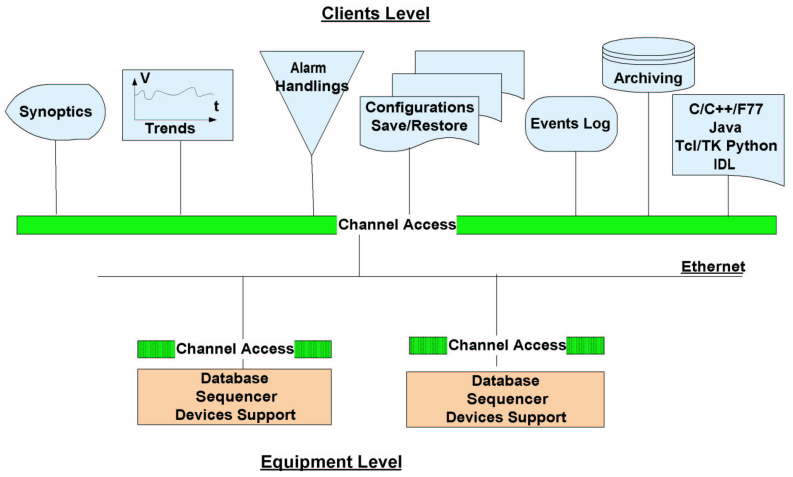
Accelerator Control and Experimental Area Slow Control Architecture

- Standard model
  - Workstation/server level
  - Front-end level
  - Ethernet for communication
- Great flexibility in I/Os
  - VME or VXI
  - PLCs + IP gateways
  - Fieldbuses (TBD)
  - GPIB
  - Serial lines



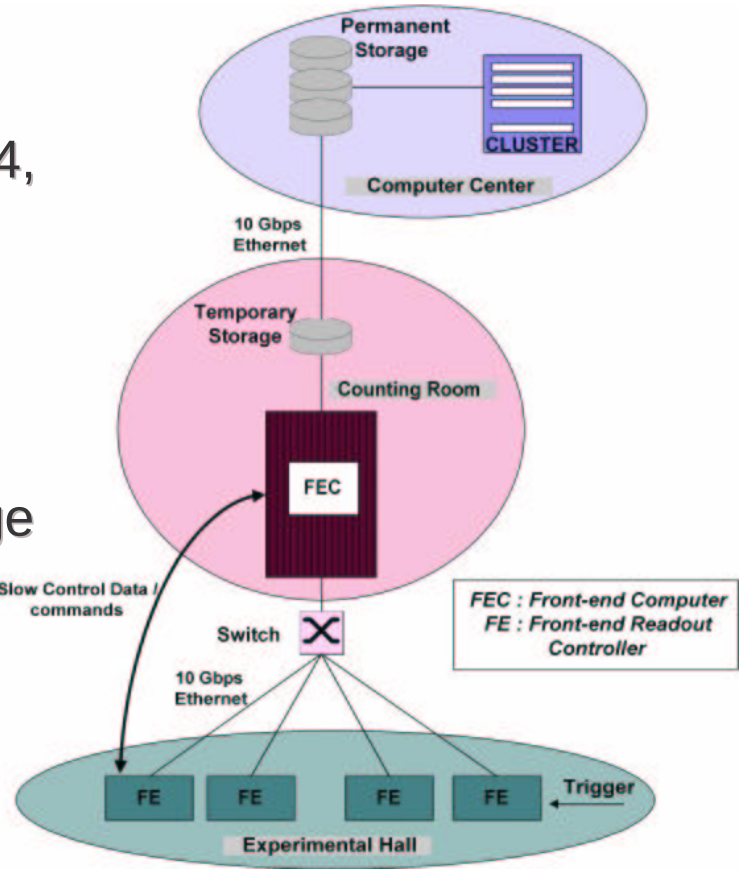
Accelerator Control and Experimental Area Slow Control Software

- Use of EPICS control software
- EPICS supports all the needed I/Os configurations
- Client/server architecture
  - Real-time DB server at front-end level
  - Clients at workstation/server level
- Off-line DB server for configuration
  - Coherency in naming convention
  - Generation of EPICS DBs



Acquisition

- Fast front-end electronics with local memory to build/store histograms (up to 10^5 pixels, 2000 time channels) ➜ VME64, VXI, CPCI others ?
- Histogram uploaded at the end of the run
- High volume of data needs fast links: 10 Gbps Ethernet
  - Front-end to computer for local storage system
  - Local storage to computer center and permanent storage



Scientific Computing

- Standard UNIX computers
  - In the experimental halls
  - In the computing center
- Experimental data storage on NAS filers (1 to several TB)
- High performance LINUX clusters
  - Beowulf for // programming
  - Dynamic resource sharing done with dedicated tools
- Centralized tape backup library
  - High density: 50TB w 600 tapes
  - High speed: 40 GB/ h