KEKB Control system status

for KEKB Review
2005.2.22

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The Challenge to the KEKB control:personal view

1. **Some Equipments get old.**
   - **Network**
   - **IOC CPU**
   - **Server**
2. **More and more Data to analyze**
   - **Storage management. How to deal with multi TB of data**
   - **How extract meaningful conclusion from these data**
3. **Catch up rapid evolution of technology**
   - **Everything connected to Network**

Network

- Current KEKB-control network
  - FDDI Based
  - Working stable but becoming difficult to get FDDI equipments
  - GbE central switch and several Edge switch was introduced.
  - Gradually moving to GbE backbone
- Terminal servers have became obsolete
  - IOC console port and the serial port of RAS module should be accessible from the KEKB control system.
  - New terminal servers as spare
  - Direct serial port-network connecting adopters are examined.

IOC CPU

- We have been using Force Power Core 6750 as the main IOC CPU.
  - Force has discontinued this CPU.
    - CPU695, successor of PC6750, was tested with EPICS3.14.x and show the good performance.
  - BSP used in KEKB has the problem in Fast Ethernet Support
    - New BSP solved this problem but need Tornad2 and EPICS3.14.x

Server

- Main Server in KEKB control system
  - K460 running HPUX10.2
  - Stable operation wit RAID
  - Support VxWorks/Tornado
  - BUT:
    - RAID size is only 20GB
    - Cannot support latest Tornado/VxWorks
    - Network upgrade to GbE may be difficult. if it is not impossible.

Data storage/Data logging

- 2GB/day = 0.5-1TB/year
  - 1 NAS per year
  - How many NASes in KEKB ?
    - we need to optimize management costs for these NASes.
- "More data" requires:
  - Fast data retrieval,
  - Good data analysis/mining tool.
    - Currently we use kblog/kblogrd/KBLOG browser

Data storage/Data logging

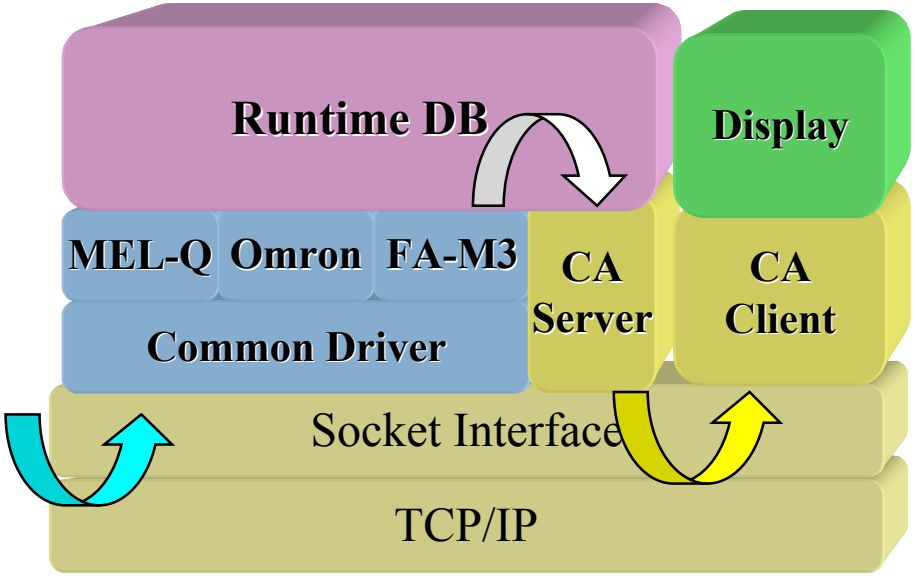
- kblog/kblogrd works OK but major improvement would be difficult because the primary designer of the software has left KEK.
    - Nakamura-san extend the kblogrd command to run both big-endian and little-endian machine.
- Should we move to EPICS new Archiver for the future?
  - How to deal with existing data?
    - data conversion
    - unified access method to KEKBLOG/EPICS Archiver
- Electric Logbook:
  - Starting point for data-mining.
  - zLog is an attempt to realize it.

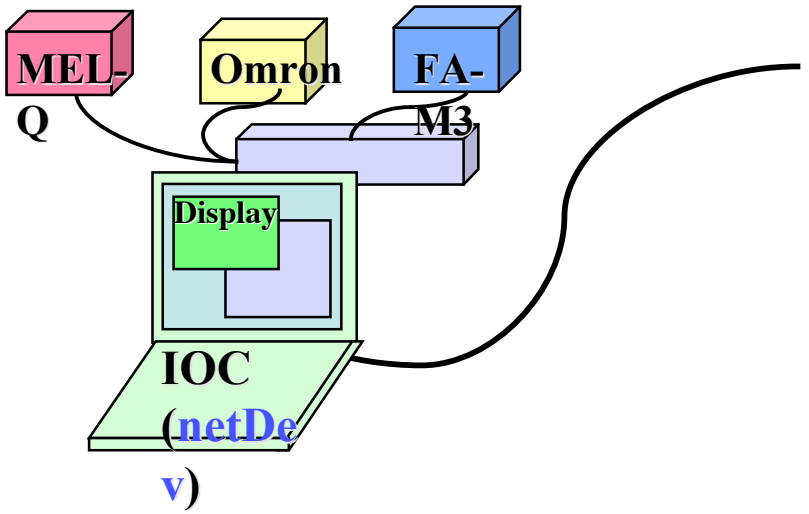
Everything connected to Network

- Interface standards in KEKB
  - CAMAC
  - ARCnet
  - GP-IB
  - VXI
  - VME
  - Serial line, ...
- How many of them will be available after 5 years from now?
  - Device is getting smarter and smarter.
    - Embedded EPICS: running EPICS db/CAS on an embedded controller.
  - Everything connected to Network!?
    - we are already prepared! :"NetDev"

netDev

- netDev: A framework to support Ethernet Based PLC
- Convert the request from CA or EPICS database to device dependent protocol.
  - –clearly divide device depend and device independent part for efficient development.
  - –Currently support 3 PLCs（MELSEC, Omron, FA-M3）and 3 custom controller boards
  - –Open source （LGPL）
  - –Used in several projects.





Conclusion

KEKB control system working Fine but needs some upgrade to keep up with the technology changes and requirements from the users.

We also need to continue the development of the new tools to support requirements in the future in time.

- netDev
- Secure EPICS
- Data mining tools