
LHCb Controls

Status and Progress

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Progress

◆ User Requirements

- Joint LHCb/ALICE URD for the DCS kernel
 - » Available as LHCb note 98-005
- No much progress on the LHCb specific
 - » Questionnaire sent. One reply received.
 - » Maybe is too early?

◆ LHC Joint Control Project (JCOP)

- We are putting quite a lot of effort from LHCb (0.5 FTE)
- Active participation in various sub-projects

JCOP

- ◆ Organization:
 - Started last December
 - Project leader: David Myers (IT/CO)
 - Steering group (2 people each experiment + 2 people CO group)
 - Project team. Meetings every 1-2 weeks.
- ◆ Current work items
 - Technology survey, CAN bus, Architecture, Safety, ...
- ◆ Workshop (CERN, June 3-5)
 - Current practices, LHC sub-detector requirements
- ◆ Information: <http://itcowww.cern.ch/JCOP>

JCOP: Architecture sub-project

◆ Objective

- To design and architecture which implements the known requirements (scale, DAQ integration, etc.).

◆ Deliverable

- Architectural design document by summer.

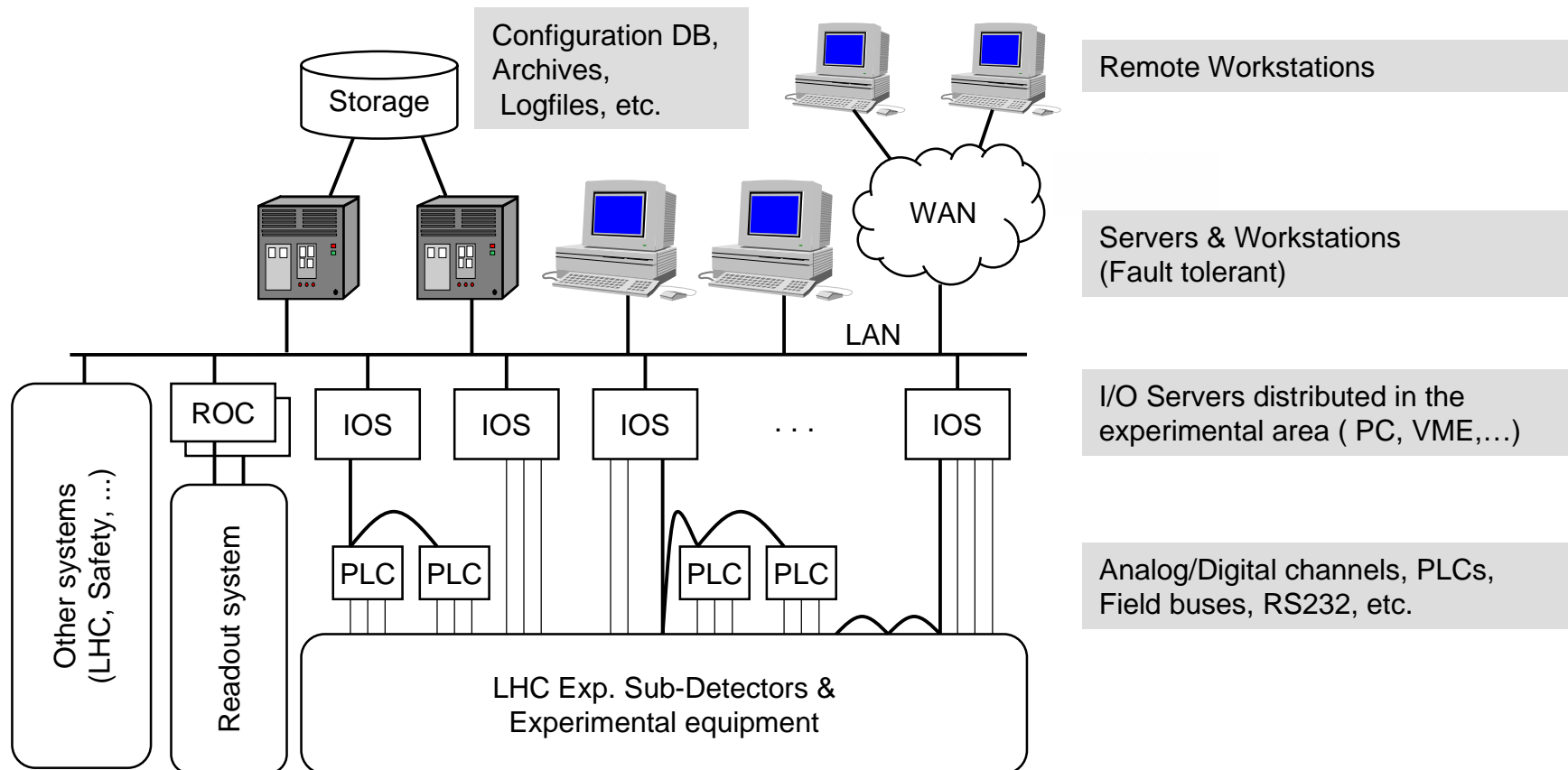
◆ Progress

- First ideas of an architecture exists. On the process of discussion specific points.

◆ People

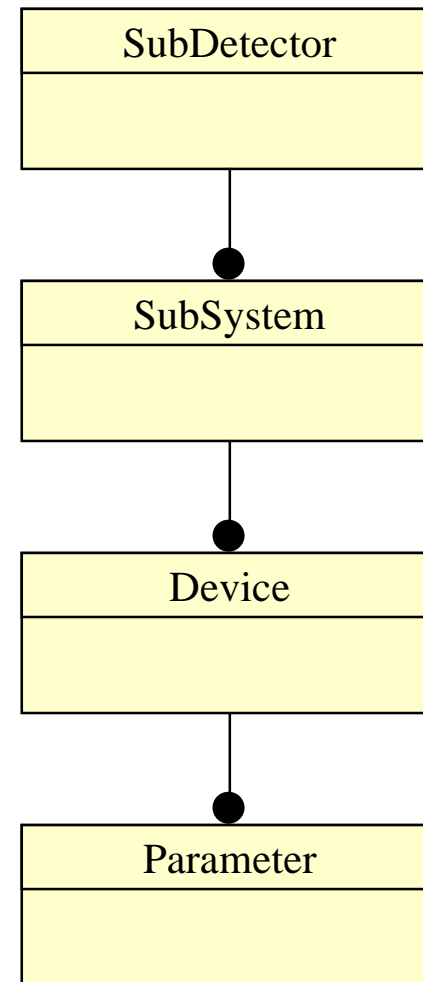
- About 10-12 participants (Beat, Pere, Wolfgang from LHCb)

JCOP: Architecture: Hardware

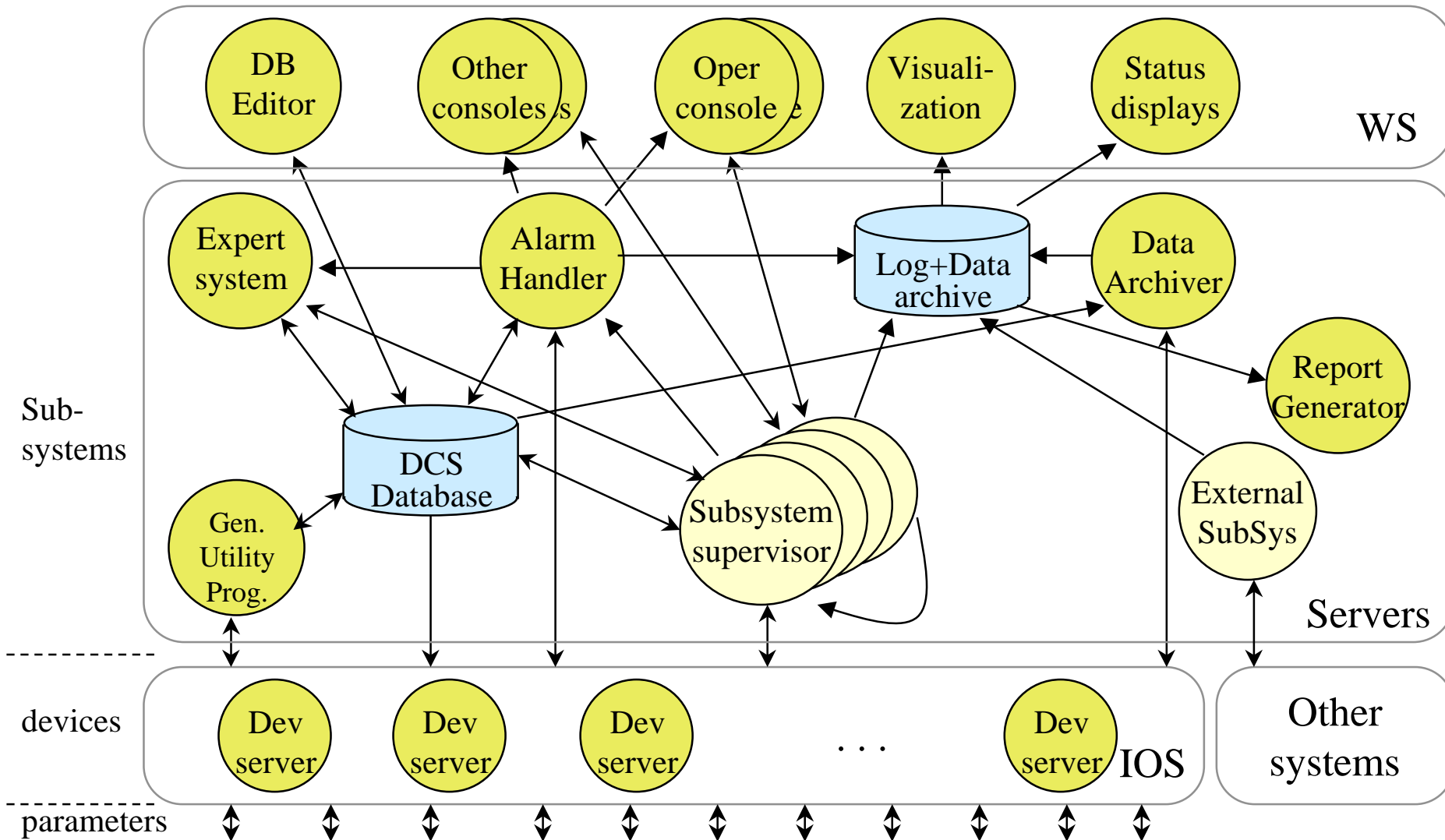


JCOP: Architecture: Data Model

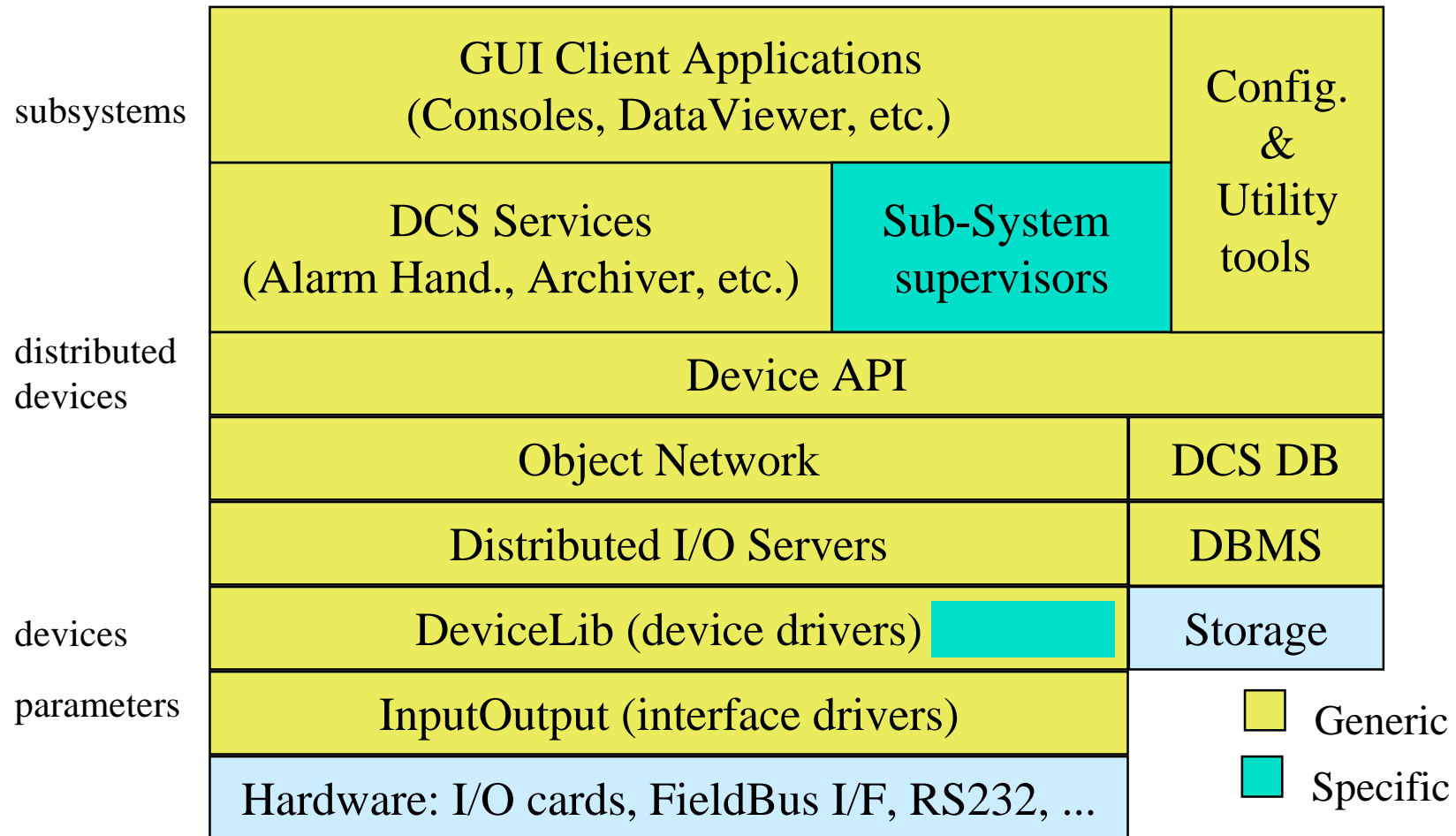
- ◆ Hierarchy of abstractions to handle the complexity:
 - Few parameters are grouped logical into a device which represents a physical device (e.g. VME power supplier)
 - Devices are grouped into sub-systems (e.g. RICH HV sub-system)
 - Each sub-detector has several sub-systems.



JCOP: Architecture: Task



JCOP: Architecture: Software



JCOP: CAN bus sub-project

◆ Objectives

- 3 parts: Hands on CAN bus, Local Monitor Box (ATLAS), Standalone small control system.

◆ Progress

- Two meetings.

◆ People

- Mainly ATLAS. (Andre from LHCB)

JCOP: New sub-project proposals

- ◆ A proposal from ALICE has been presented.
- ◆ Plans to propose a new sub-project from LHCb.
 - Objectives:
 - » Evaluation of the Component Technology (DCOM) for controls. (Implementation of the architecture)
 - » Evaluation of OPC (OLE for Process Control) standard.
 - People:
 - » Some fraction of FTE from existing people plus Cooperant starting in September.

JCOP Workshop

- ◆ CERN, June 3-5
- ◆ Program
 - *Current Practice. Presentations from current and about to come on-line experiments.*
 - *LHC experiments requirements and technical sessions.*
 - » *Presentations from the 4 experiments.*
 - *Selected discussion topics: Architectures, Integration DCS and Run Control, commercial vs. home-made, re-engineering, ...*
- ◆ Participation
 - *About 140 people. 50% from outside CERN.*

JCOP Workshop: Outcomes

- ◆ Spread of some ideas:
 - Integration with the control of DAQ. Integrated **Experiment Control System**.
 - The importance of well defined interfaces (architecture).
Advantages of using devices instead of channels.
 - Usage of PLCs, Field buses in modern systems.
- ◆ Market survey:
 - The role of Windows NT on modern commercial products.
 - Parameter oriented instead of device oriented.
 - No FSM.

LHCb Controls project: Organization

- ◆ The LHCb Controls Project is part of the overall *Computing Project* which includes the on-line and off-line computing activities and covers both hardware and software.
- ◆ A dedicated team will be responsible for the *common control infrastructure*. The sub-detector teams will be in charge of adapting/developing sub-detector specific applications.
- ◆ Currently 3 people on the central team.

LHCb Controls project: Planning

- ◆ Main Milestones:

- Choice of technology for the hardware interfaces: Jan 2000
- Choice of final product/technology: Jan 2002
- Installation/integration & commissioning during 2004
- Operational system in 2005

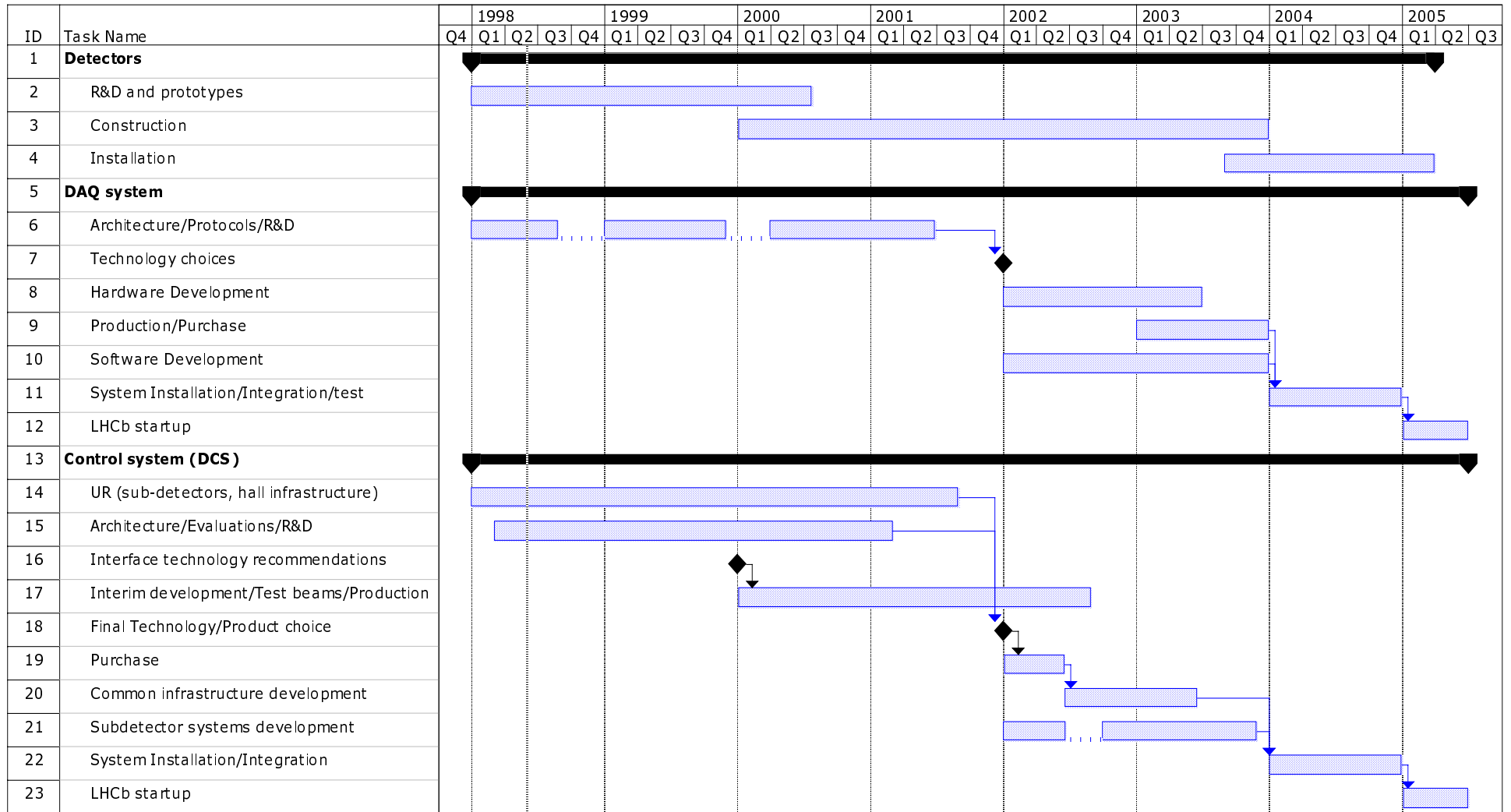
- ◆ From now to Jan 2002 ...

- Understanding requirements.
- Architecture design.
- Coordination.
- Evaluations of products and technologies.
- R&D. Prototypes. Interim solutions.

Evaluations, Prototypes and R&D

- ◆ Gathering knowledge for final product/technology choice.
- ◆ Activities which are interesting from our point of view:
 - **Field buses:** Understanding them. Hands-on practice. Limitations. Software protocols. Hardware interfaces.
 - **PLCs:** Understanding them. Hand-on practice. Limitations.
 - **OPC standard:** Understanding the standard. Test various configurations. Survey market.
 - **Integration technologies:** Understanding them. Building systems out of software components (componentware). Prototypes.
- ◆ Most of the activities can be done under JCOP.

LHCb Controls Project: Planning (2)



Conclusions

- ◆ We still need to do our home work of collecting and understanding the LHCb sub-detector specific requirements. Understanding time scales.
- ◆ Continuation with the participation in various sub-projects in the context of the JCOP. Everybody is welcome.