

ATLAS

DAQ ↔ DCS

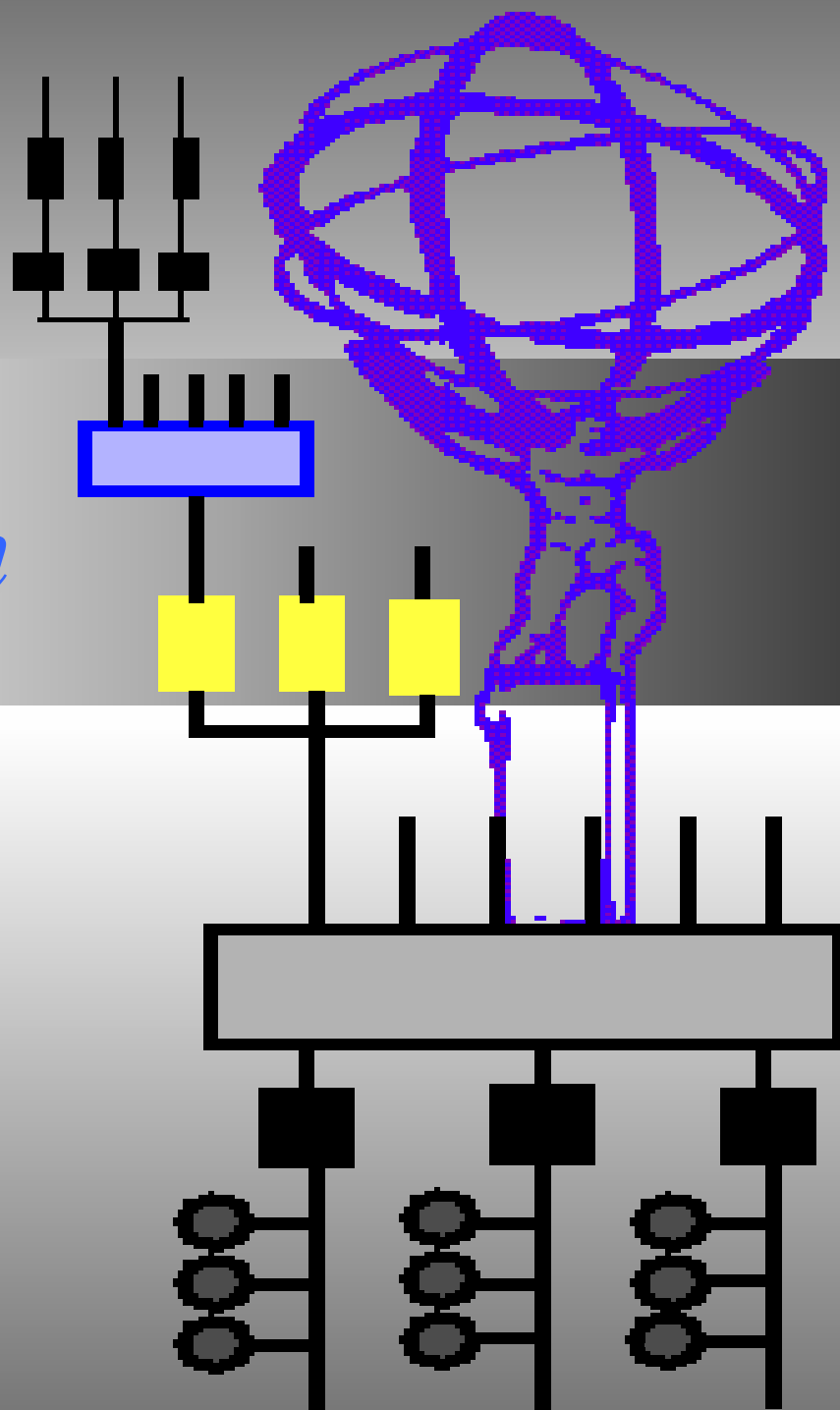
Communication

(DDC)

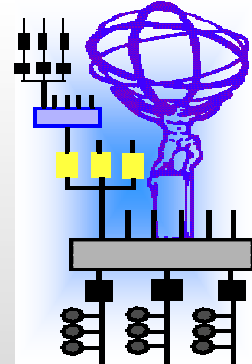
Introduction

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ATLAS DCS Workshop

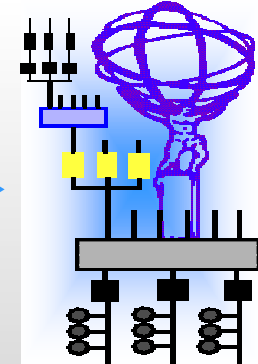


Why DDC ?



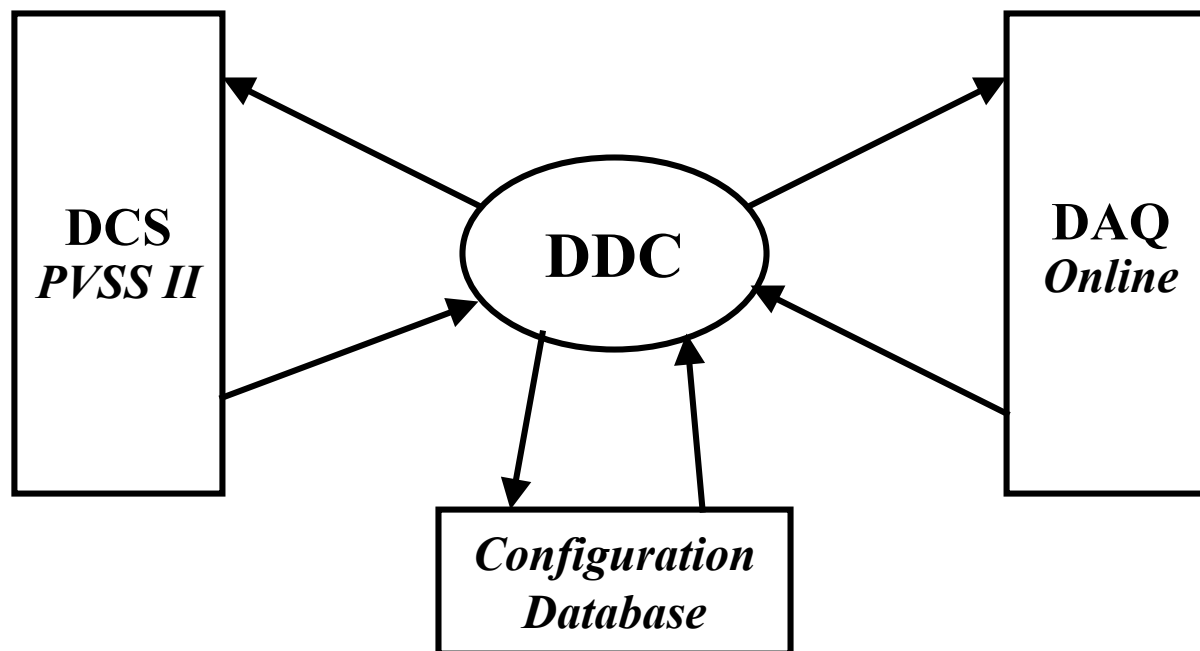
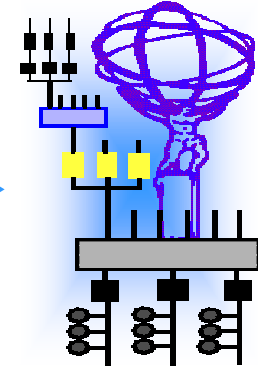
- **ATLAS: control paths DAQ & DCS are separated (physical and logical)**
- **Communication is needed:**
 - Data exchange (parameters, status)
 - Messages like alarms from DCS → DAQ
 - Commands from DAQ → DCS
- **Goal of DDC:**
Interface between DAQ & DCS

DDC domain decomposition

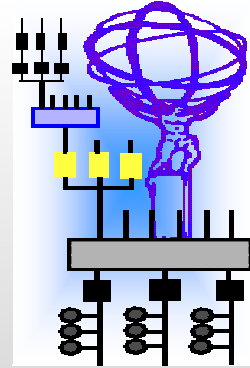


- **DDC-DT**: Bi-directional exchange of data like parameters and status values.
- **DDC-MT**: Transmission of DCS messages (*alarms*) to DAQ.
- **DDC-CT**: Ability for DAQ to issue commands on DCS (*load, start, run, etc*).
- **Interface points:**
 - DCS: PVSS II
 - DAQ: Online

DDC Context Diagram

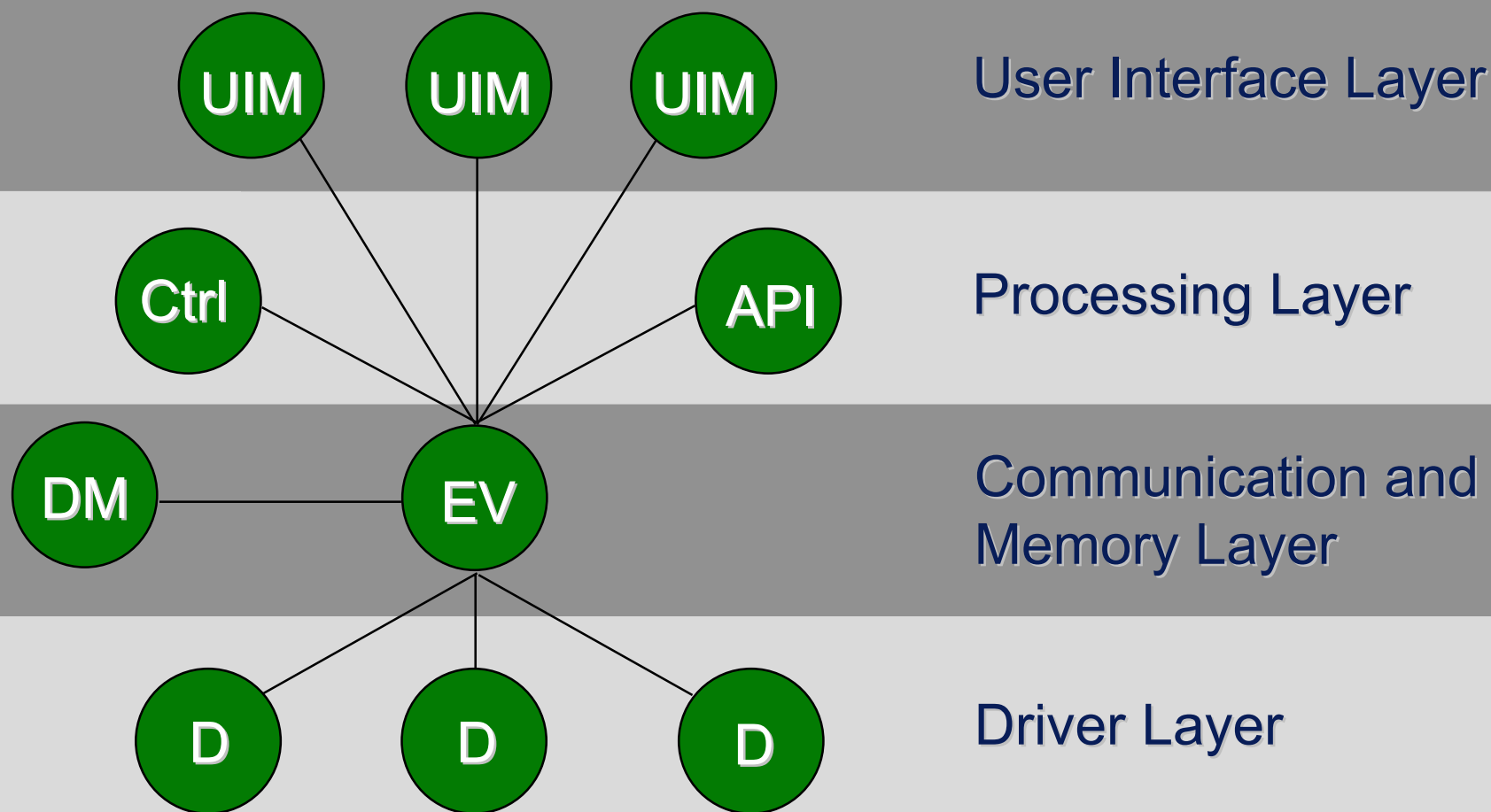
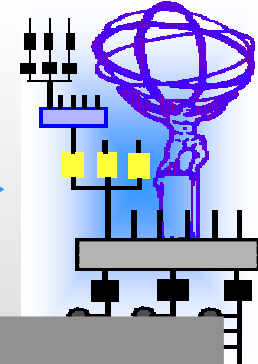


Design Prerequisites

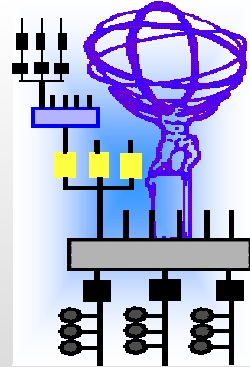


- Any manipulation with the physics data is beyond the scope of the DDC software.
- The DCS is expected to be operational at all times.
- Partitioning: DDC is aware, but not responsible !
The concept is known to both DAQ and DCS and should be compatible in terms of boundaries and locking of resources.
 - DAQ: a subset of the experiment capable to run independently.
 - DCS: vertical slice, which controls a subsystem, defined as an arbitrary part of the detector.

PVSS II Architecture

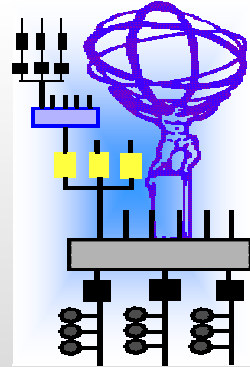


PVSS II Architecture



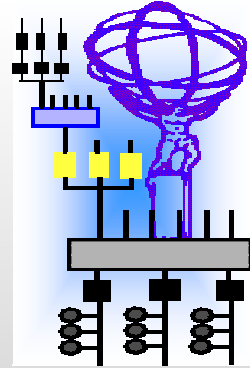
- **API Manager**
 - C++ class library
 - Interface to external world, like DDC
- **Event Manager (EV)**
 - Administers *datapoints* and events
 - Datapoint: basic data container (simplex and complex)
- **Control Manager**
 - Complex processing of data points
 - Interpreter with C++ syntax (NB: indexing starts at 1 !!!)
- **Platforms: WNT & Linux !**

Online Software



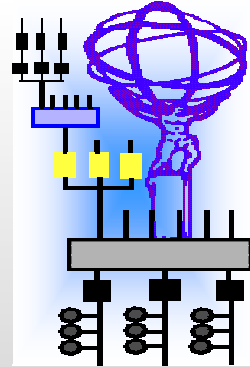
- **Subsystem of ATLAS DAQ/EF Prototype-1**
 - Others: Detector Interface, Data Flow, Event Filter
- **Software for Configuring, Controlling and Monitoring the DAQ system**
 - Excludes the processing and transportation of physics data
 - General Purpose “Control System”: *Open Source*
 - The Software *glue* of the Experiment
 - Primary programming language: C++
 - Internal communication: CORBA (ILU)
- **Platforms: Linux, LynxOS, Solaris**

Online Components



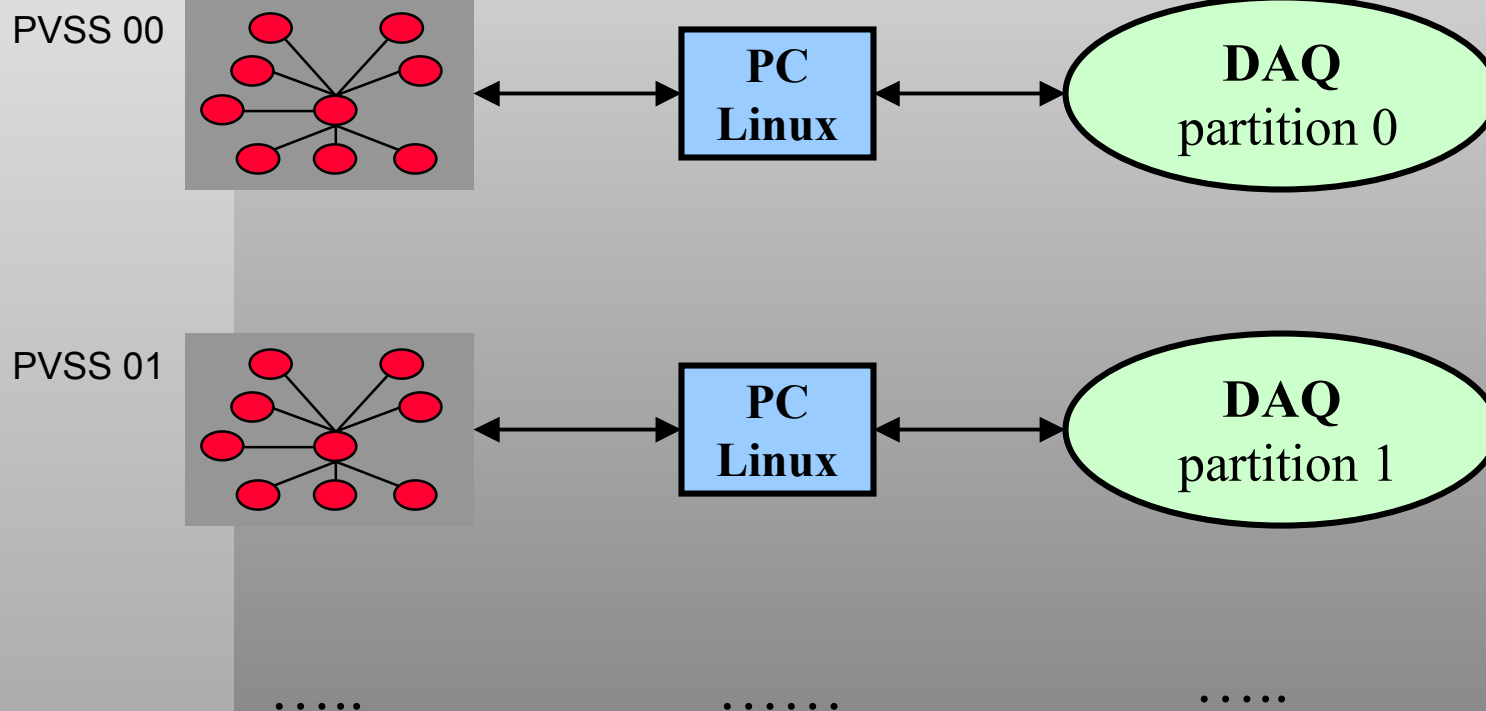
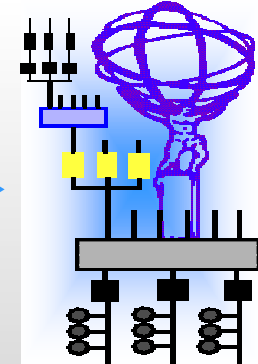
● Run Control	Controls configuration and data taking operations
● Configuration Databases	Defines all aspects of the configuration
● Information Service	General purpose information exchange
● Message Reporting System	Report/capture of error/information messages
● Process Manager	Distributed job control of programs
● Resource Manager	Allows concurrent data taking activities
● Integrated User Interface	Gives current status and control to shift operator
● Online Bookkeeper	Electronic tape log book
● Test Manager	Bank of functionality tests for hardware and software
● Diagnostics System	Uses tests in the Test Manager to diagnose problems
● Event Dump	Event monitoring program with GUI

DDC & Online

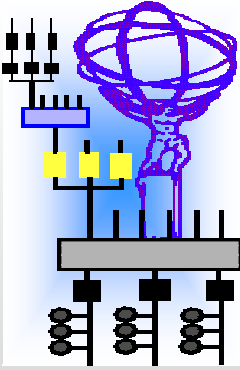


- **DDC_DT: Data Exchange Facility** (DAQ \leftrightarrow DCS)
 - Information Service (IS) component
- **DDC_MT: Message Passing Facility** (DCS \rightarrow DAQ)
 - Message Reporting System (MRS) component
- **DDC_CT: Passing Commands** (DAQ \rightarrow DCS)
 - Run Control (RC) component

Current Implementation



DDC wrap-up



- **DDC: joint ATLAS DAQ/DCS project**
 - collaborators: CERN, NIKHEF, PNPI
- **DDC: ready to use (release 0.2; DDC_MT not yet)**
- **Part of Online distribution (binaries, libraries, code & documentation) as full component**
- **Used at Tile-Calorimeter & Muons test-beam at CERN**
- **Main source of documentation:**
 - ATLAS Online homepage:
<http://atddoc.cern.ch/Atlas/DagSoft/Welcome.html>
 - ATLAS DCS homepage:
<http://atlasinfo.cern.ch/ATLAS/GROUPS/DAQTRIG/DCS/dcshome.html>