New projects in Controls

CERN openlab

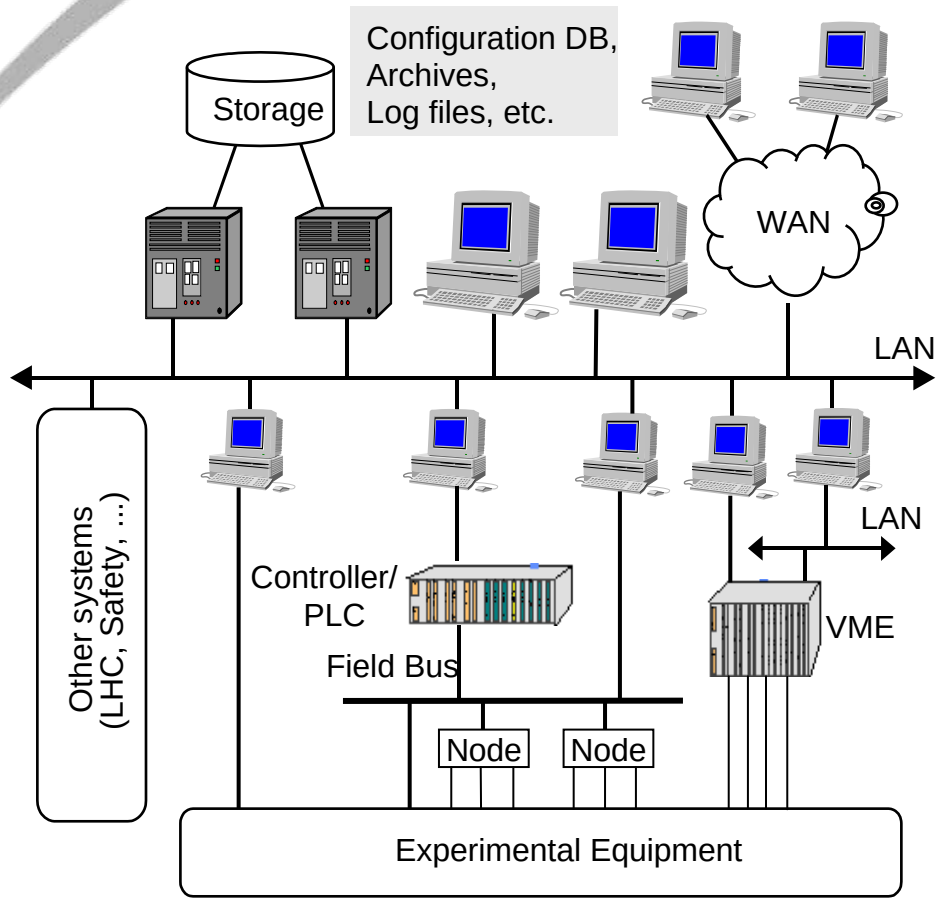
18 September 2008

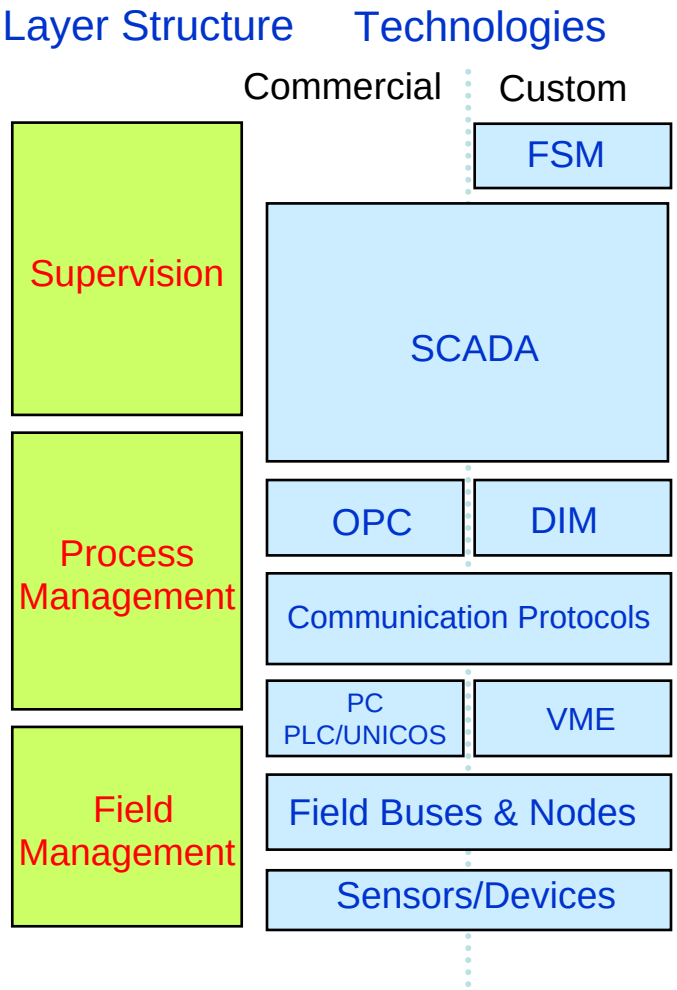
Renaud BARILLERE

Outline

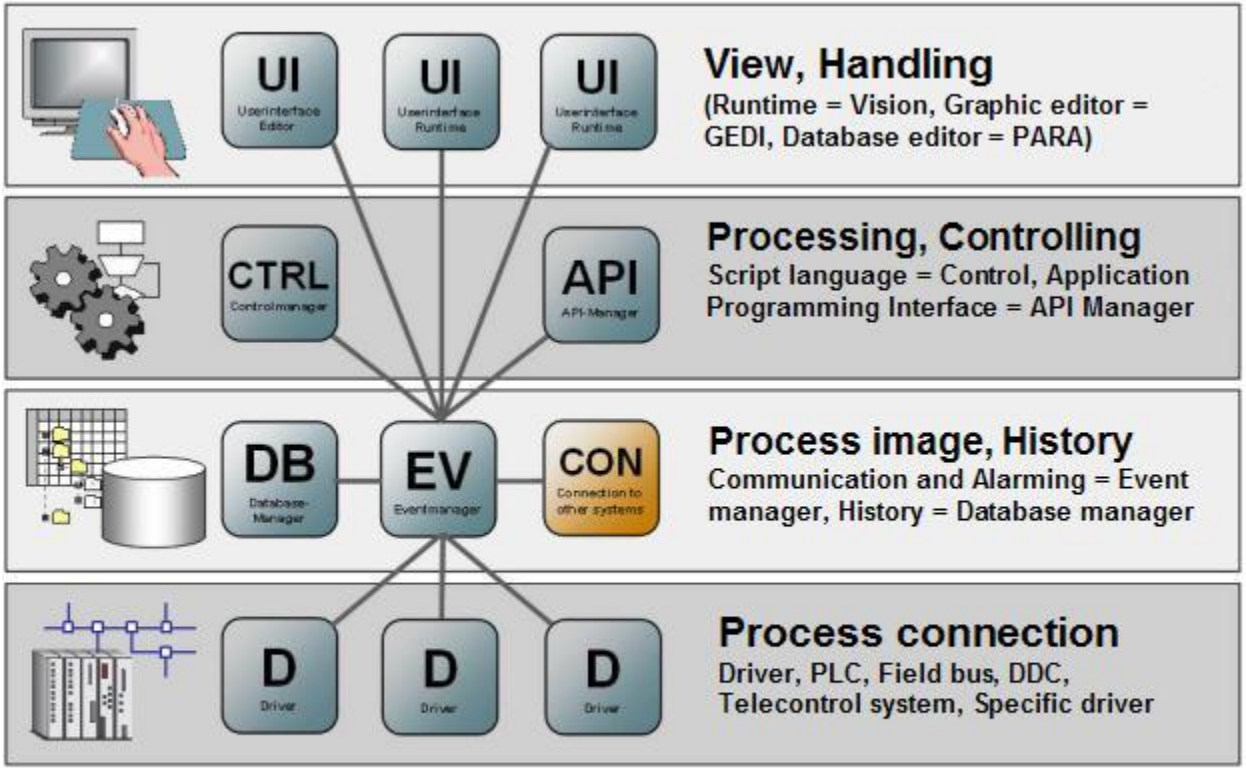
- Siemens in CERN controls
- Issues and program of work with PVSS
- Issues and program of work with PLCs

Controls architecture





ETM's PVSS


UI
Userinterface Editor
UI
Userinterface Runtime
UI
Userinterface Runtime
View, Handling
(Runtime = Vision, Graphic editor = GEDI, Database editor = PARA)
CTRL
Controlmanager
API
API-Manager
Processing, Controlling
Script language = Control, Application Programming Interface = API Manager
DB
Database-Manager
EV
Eventmanager
CON
Connection to other systems
Process image, History
Communication and Alarming = Event manager, History = Database manager
D
Driver
D
Driver
D
Driver
Process connection
Driver, PLC, Field bus, DDC, Telecontrol system, Specific driver

PVSS at CERN

- The recommended SCADA at CERN
  - LHC Experiments DCS
  - Fixed target experiments
    (e.g. Compass, NA48 -> NA62)
  - Accelerator Control systems
    (Cryo, Vacuum, etc.)
- A large number of installations
  - About 500 licenses
  - About 150 PVSS systems in a large LHC experiment

PVSS related program of work

- Open PVSS development environment to Software Engineering
  - Source code management (CVS, Subversion)
    - Panels, files and data
  - Configuration management
  - Improvement of debugging facilities
  - Toward a standard scripting language?
- PVSS deployment in large environment
  - Monitoring & deployment
- Security
  - Engineering & Operation

Siemens PLCs

- HW
  - Dedicated control computer
  - Diskless
  - Specific programming languages
  - Cyclic behavior
  - Limited memory
- Purpose
  - I/Os acquisition
  - Interlocks
  - Control loops
  - Automatic systems (e.g. Finite State Machine)

Siemens PLCs at CERN

- One of the two recommended PLC manufacturers at CERN
- Used for:
  - Accelerators, experiments, infrastructure
- A large set of deployed Siemens PLCs
  - About 500 Siemens PLCs
  - S7-400, S7-300, S7-200

PLC related program of work

- Security
  - Robustness & vulnerability tests definition
  - Hardening of automation devices (Operation and engineering perspectives)
- Opening Step7 to software engineering
  - Source code management
  - 3rd parties development tools
- Deployment in large environment
  - Step 7
  - Simatic Net
  - Etc.

Status

- Contract signed very recently
- Recruitment procedure started
- First preparation meeting with Siemens and ETM