ST/CV Control System and Projects

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Summary

- The ST/CV control system requirements
- ST/CV control system architecture
- Integration in CERN Network
- Projects and contracts (running / terminated) -> Controls Examples
- Future projects -> Project Example
- Conclusions

CV Control System Requirements

- **ST/CV Control System design stage for LHC projects started more than 5 years ago**
  - First technical specifications for LHC-Ventilation surface buildings in 1997
  - Use of reliable automatism (Siemens, Schneider)
  - A powerful local supervisory SCADA System included well adapted operation and maintenance tools (Wizcon)
  - Standardized interfaces and protocols
  - Openness and networking: To provide flexibility in a distributed environment
  - Following the industrial evolution: Today still staying operational for the next 15 years

CV Control System Architecture

- Data archiving and web-based supervisory tools
- Trouble Diagnosis
- Post-mortem analysis
- Communication to: Central Alarm Server (CAS)
- Technical Data Server (TDS)
- New: WEB-Access to layer 2

- Layer 4: Data handling and WEB supervision
- Web-access to local process supervision (layer 2)
- CERN technical data monitoring
- Data coherence
- Standardization of interfaces

- Layer 3: TCR remote supervision
- Flexibility
- Process-customized solutions
- Windows NT Workstations
- Windows 2000 Workstations
- SCADA: Wizcon

- Layer 2: Local supervision
- Process regulation
- Reliability
- Availability
- Maintainability
- Network: Ethernet TCP/IP
- PLC: Schneider / Siemens

- Layer 1: Acquisition and regulation
Integration in CERN Network

Topologie Ethernet Services
Point 4

Liaison fibre optic réseau de contrôle

Default gateway: 128.142.36.1
Subnet Mask: 255.255.252.0

SR4 - Bat. 2475

Topologie Ethernet Services
Point 5

Default gateway: 128.142.37.43
Subnet Mask: 255.255.252.0

SP4 - Bat. 2484

ST/CV Projects and Contracts (running and terminated)

- F - 405 Air handling installations for two experimental areas ATLAS / CMS (2004)
- F - 480 Supply and installation of air-conditioning for the SCX 1 building (2004)
- F - 472 Hydraulic, electrical and control modifications of LEP water cooling (2004)
- CD-1000869 Supply and installation air extraction for TI2 and TI8 injection tunnels (2003)
- CD-1000931 Demineralised water circuits for CMS surface tests (2003)

Examples for some projects (PLC configuration and SCADA Mimic Diagrams) ...
Future ST/CV Projects

- CNGS and Hadron Stop ventilation
- CNGS cooling
- Upgrade of Clean and Waste Water Systems of LHC
- Cooling of Dump Quench Resistors
- Air-Conditioning in SCX5 and UX85
- Air-Conditioning of Racks in SDX1
- CMS Cooling Plants
- Renewal of PM 32 Pumping Stations Control System
- LHC Ventilation – Process Controle Migration (LEP -> LHC) --> some details ...

Conclusions

- The control of cooling or ventilation processes can be achieved without considering specific solutions and by using a fully Industrial SCADA-based control architecture.
- The retained solution provides a high process control precision.
- The reusability of the well-proven solutions results in safer control systems: better reliability and maintainability of the process.
- A global vision of the cooling and ventilation facilities allows to achieve the required levels of flexibility, coherence and homogeneity in order to assure the follow-up of the technical evolution.