The CERN Accelerator School

Contribution ID: **24**   Type: **not specified**

Controls

Thursday 14 March 2024 13:55 (1h 5m)

The control system provides means to interact with the accelerators to the physicists and operators. Key Control System requirements are Settings management and control, acquisition with possible post-processing, long-term data logging, automation, and monitoring and diagnostics. Whenever possible, the Control System is based on industrial solutions for both the hardware and the software. However, several domains call for a custom solution and, in those cases, established standards and commercial-off-the-shelf (COTS) are used to build the system. With the rapid evolution of the CPUs available on the market, the Control Systems are now very capable compared to the early systems. There are still several systems, such as the CERN Control System, EPICS, and Tango, but a modern Control System is typically based on 3 hardware layers: The resource tier close to the accelerator hardware, the server tier with the central computing infrastructure, and the client tier installed in the Control rooms. Software-wise, the lower tier is dedicated to real-time processing with programs running on the Front-End Computers (FEC). The middle tier, or business tier, hosts the general and control-specific high-level services, while the top tier, the presentation tier, runs the Graphical User Interfaces (GUI). At CERN, the setting management system (LSA) will translate high-level values into low-level hardware values before sending them to the real-time control driven by the Central Timing system. For acquisition logging and post-processing, systems such as NXCALS and UCAP are used.

Presenter: DEGHAYE, Stephane (CERN)