Contribution ID: **189** Type: **Parallel**

The Compact Muon Solenoid Detector Control System

Monday, May 21, 2012 5:25 PM (25 minutes)

The Compact Muon Solenoid (CMS) is a CERN multi-purpose experiment that exploits the physics of the Large Hadron Collider (LHC). The Detector Control System (DCS) ensures a safe, correct and efficient experiment operation, contributing to the recording of high quality physics data. The DCS is programmed to automatically react to the LHC changes. CMS sub-detector's bias voltages are set depending on the machine mode and particle beam conditions. A protection mechanism ensures that the sub-detectors are locked in a safe mode whenever a potentially dangerous situation exists. The system is supervised from the experiment control room by a single operator. A small set of screens summarizes the status of the detector from the approximately 6M monitored parameters. Using the experience of nearly two years of operation with beam the DCS automation software has been enhanced to increase the system efficiency. The automation allows now for configuration commands that can be used to automatically pre-configure hardware for given beam modes, decreasing the time the detector needs to get ready when reaching physics modes. The protection mechanism was also improved so that sub-detectors could define their own protection response algorithms allowing, for example, tolerating a small proportion of channels out of the configured safe limits. From the infrastructure point of view the DCS will be subject to big modifications in 2012. The current rack mounted control PCs will be exchanged by a redundant pair of DELL Blade systems. These blades are a high-density modular solution that incorporates servers and networking into a single chassis that provides shared power, cooling and management. This infrastructure modification will challenge the DCS software and hardware factorization capabilities since the SCADA systems running currently in individual nodes will be combined in single blades. The undergoing studies allowing for this migration together with the latest modifications are discussed in the paper.

Summary

CMS Detector Control System is preparing a computing hardware infrastructure upgrade. This upgrade will provide CMS with a highly compact and redundant controls computing system. There is a big impact in the architecture of the SCADA systems and the challenges, solutions and undergoing studies are presented in the paper.

Primary author: GOMEZ-REINO GARRIDO, Robert (CERN)

Co-authors: FLOSSDORF, Alexander (Deutsches Elektronen-Synchrotron (DE)); HOLZNER, Andre Georg (Univ. of California San Diego (US)); PETRUCCI, Andrea (CERN); SPATARU, Andrei Cristian (CERN); Dr RACZ, Attila (CERN); DUPONT, Aymeric Arnaud (CERN); DELDICQUE, Christian (CERN); HARTL, Christian (CERN); PAUS, Christoph (Massachusetts Inst. of Technology (US)); SCHWICK, Christoph (CERN); SHPAKOV, Denis (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown); GIGI, Dominique (CERN); MESCHI, Emilio (CERN); GLEGE, Frank (CERN); MEIJERS, Frans (CERN); BAUER, Gerry (Massachusetts Inst. of Technology (US)); Dr POLESE, Giovanni (CERN); SAKULIN, Hannes (CERN); Mr BRANSON, James (UC San Diego); Dr HEGEMAN, Jeroen (CERN); Dr COARASA PEREZ, Jose Antonio (CERN); SUMOROK, Konstanty (Massachusetts

Inst. of Technology (US)); MASETTI, Lorenzo (CERN); ORSINI, Luciano (CERN); Dr DOBSON, Marc (CERN); PIERI, Marco (Univ. of California San Diego (US)); SANI, Matteo (Univ. of California San Diego (US)); BOWEN, Matthew (University of the West of England); SIMON, Michal; RAGINEL, Olivier (Massachusetts Inst. of Technology (US)); MOMMSEN, Remi (Fermi National Accelerator Lab. (US)); ERHAN, Samim (Univ. of California Los Angeles (US)); BUKOWIEC, Sebastian (CERN); CITTOLIN, Sergio (Univ. of California San Diego (US)); BEHRENS, Ulf (Deutsches Elektronen-Synchrotron (DE)); O'DELL, Vivian (Fermi National Accelerator Laboratory (FNAL)); HWONG, Yi Ling (CERN)

Presenter: GOMEZ-REINO GARRIDO, Robert (CERN)

Session Classification: Online Computing

Track Classification: Online Computing (track 1)