Database Foundation for the Configuration Management of the CERN Accelerator Controls Systems

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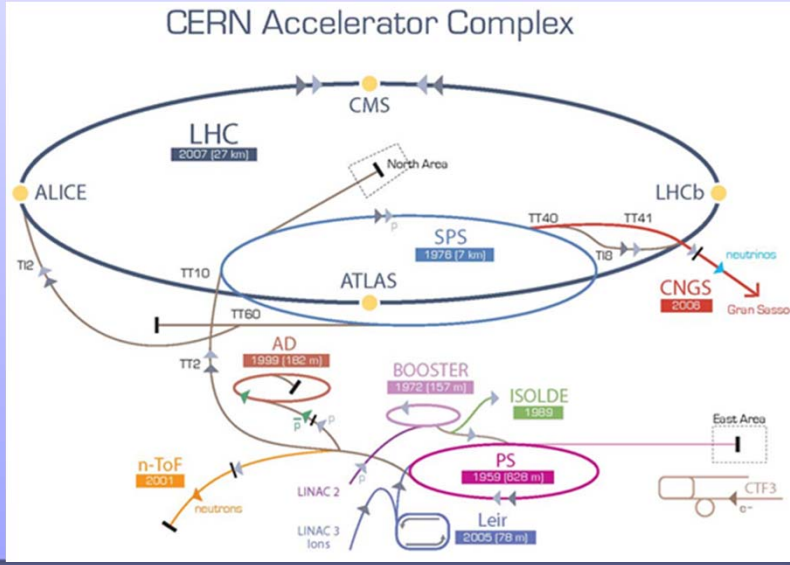
Controls Configuration Database

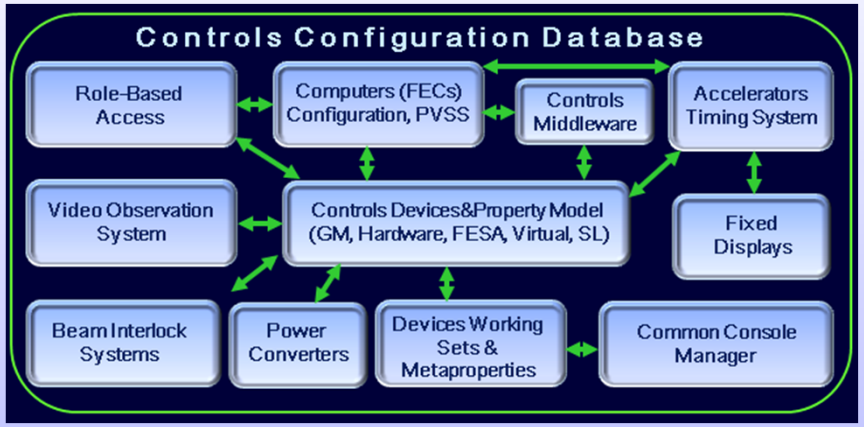
- The heart of the CERN Accelerator Controls System – supporting the requirements of the PS, SPS and LHC complexes
  - The data in the CCDB represents components and their properties as seen by the Controls System
  - Mission critical service – 24/7/365
- Core functionalities
  - Data repository for all configuration items and their relationships, required for the correct functioning of the Controls System
  - Configuration Change Management
    - Safe propagation of data changes
  - On-line feedback of deployed configurations
  - Extraction of configurations
    - Data-driven Controls System



Overview of the Controls Configuration Environment

- Database complexity - model the Controls System into a relational database, maintain data consistency while enforcing the business rules
  - Controls devices (~77,000) and parameters (~ 2,000,000); hardware and software configuration of all Front-End Computers (~3 000); Accelerators Timing System, etc.

Database Statistics	
Tables	914
Constraints	2,388
Lines PL/SQL code	42,100
Volume	60GB



- Set of 12 Data Editing applications
  - Based on Oracle ADF (J2EE); 250 users
  - Strict authorization - fine grain access control
- Data Browsing Interfaces - 160 reports covering all areas of the CCDB
  - Based on Oracle APEX; 300 users
- APIs and scripts – Java, PL/SQL, Pro*C

Conclusion

- Controls Configuration DB, related interfaces and implemented processes
  - Form the basis for the Configuration Management of the Controls System
  - Describes the different components of the Controls System and their dependencies (relations)
  - Ensures conceptual unification and centralization of the diverse configurations
  - Continuous improvement in provided functionalities with a constant focus on Quality Assurance and Data Security