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

Zornitsa Zaharieva, Manuel Martin Marquez, Maciej Peryt

CERN, Geneva, Switzerland
Beams Department, Controls Group

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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.

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<thead>
<tr>
<th>Database Statistics</th>
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<tbody>
<tr>
<td>Tables</td>
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<tr>
<td>Constraints</td>
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<tr>
<td>Lines PL/SQL code</td>
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<td>Volume</td>
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- **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