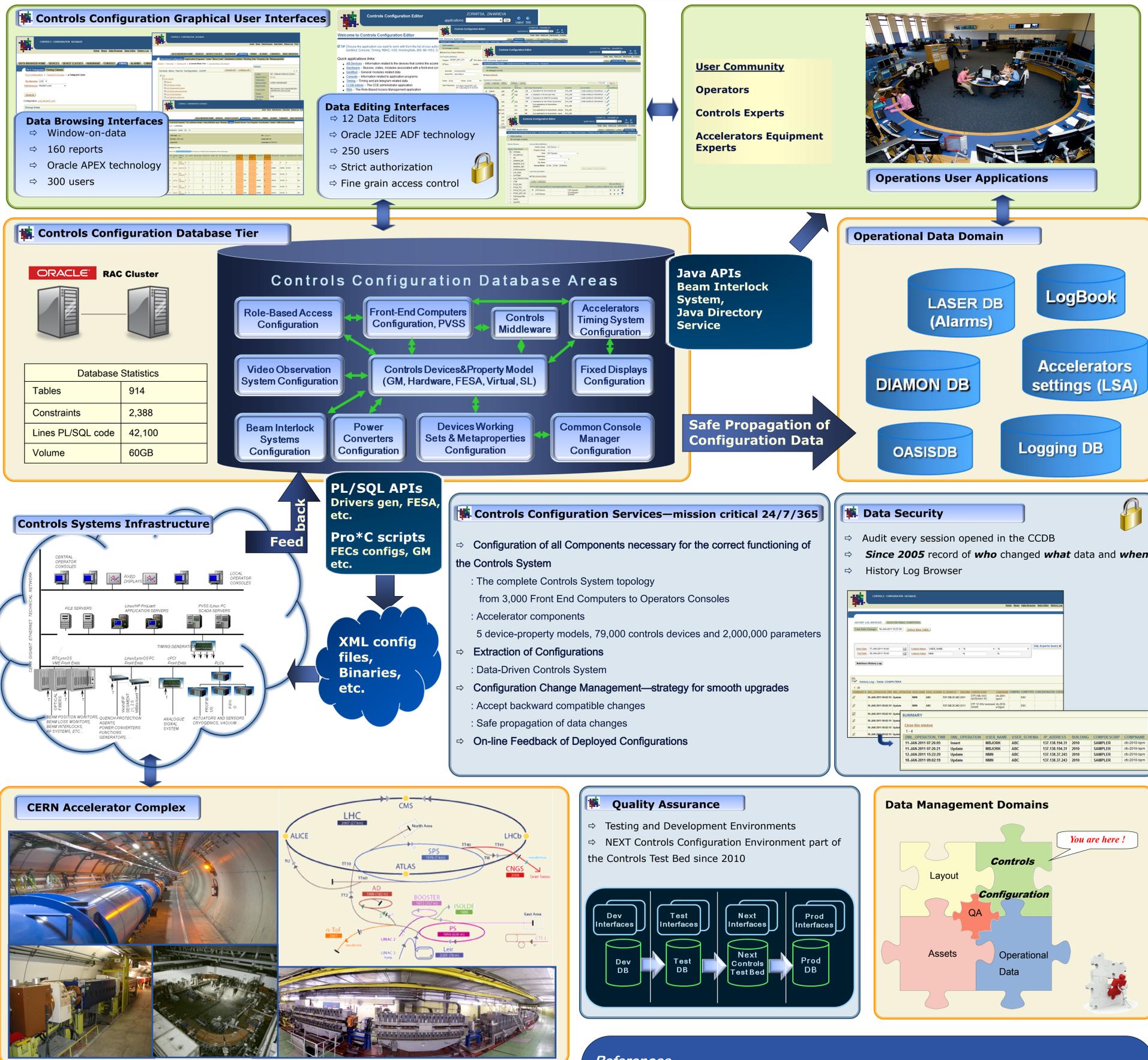


Database foundation for the Configuration Management of the CERN Accelerator Controls Systems

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Abstract

The Controls Configuration Database (CCDB) and its interfaces have been developed over the last 25 years in order to become nowadays the basis for the Configuration Management of the Controls System for all accelerators at CERN. The CCDB contains data for all configuration items and their relationships, required for the correct functioning of the Controls System. The configuration items are quite heterogeneous, depicting different areas of the Controls System – ranging from 3000 Front-End Computers, 75 000 software devices allowing remote control of the accelerators, to valid states of the Accelerators Timing System. The article will describe the different areas of the CCDB, their interdependencies and the challenges to establish the data model for such a diverse configuration management database, serving a multitude of clients. The CCDB tracks the life of the configuration items by allowing their clear identification, triggering of change management processes as well as providing status accounting and audits. This necessitated the development and implementation of a combination of tailored processes and tools. The Controls System is a data-driven one - the data stored in the CCDB is extracted and propagated to the controls hardware in order to configure it remotely. Therefore a special attention is placed on data security and data integrity as an incorrectly configured item can have a direct impact on the operation of the accelerators.



Conclusion

The Configuration Management has proven to be an indispensable part of ensuring the correct functioning of any large system. The Controls Configuration DB, its interfaces and the specific processes implemented around those, are providing the basis for the Configuration Management of the Controls System for all accelerators at CERN. The CCDB ensures conceptual unification and centralization of the diverse configurations of the different items and their relations, thus describing the different components of the Controls System and their dependencies. Continuous effort is being put into rationalizing, improving, federating and developing new functionality in the existing database and its interfaces.

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