SDD toolkit : ITER CODAC platform for configuration and development

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Abstract

- ITER will consist of roughly 200 plant system I&Cs (in total millions of variables) delivered in kind which need to be integrated into the ITER control infrastructure. The SDD model has been designed with Hibernate/Spring to provide required information to generate configuration files for CODAC services such as archiving, EPICS, alarm, SDN, basic HMIs, etc. Users enter their configuration data via GUIs based on web application and Eclipse. Snapshots of I&C projects can be dumped to XML. Different levels of validation corresponding to various stages of development have been implemented: it enables verification that I&C projects are compliant with our standards. The development of I&C projects continues with Maven utilities. In 2012, a new Eclipse perspective has been implemented to allow user to develop codes, to start their projects, to develop new HMIs, to retract their data in SDD database and to checkout/commit from/to SVN.

CHALLENGES – SCALE, COMPLEXITY, EVOLUTION

ITER machine will be built by different partners. Standardization is a key criterion for success. To avoid heterogeneous deliverables and interfaces, it is important to set a development framework for I&C designers.

SDD – Self Description Data

Why?

CODAC Core system includes many packages to ease I&C development. One of them is SDD – an in-house product. The main purposes of SDD are twofold:

- Ease the configuration management: big systems with a few millions of variables, many thousands of services to configure.
- Promote PCDH/CODAC standards validation and homogeneous structure
- Simplify the I&C development by minimizing knowledge and expertise of individual tools

What?

It describes the static configuration of the system. It consists of three views.

Technologies

SDD DB, data access, versioning
- Relational schema based on PostgreSQL database for storing physical, functional and control information
- Hibernate as an Object Relational Mapping: minimize SQL codes
- Spring as transaction management layer
- SVN to keep source code of the I&C project
- Talend: data migration in case of DB schema change

SDD toolkit is a layered architecture, consisting of many modules

How?

SDD model: 3 different views

SDD Lifecycle

Standard structure for I&C project

CONCLUSIONS AND FUTURE WORK

The development of SDD toolkit started three years ago from scratch. Now the SDD toolkit is becoming more stable and a mature product. Current development is now mainly focused on the support for remote execution especially when dealing with fast controllers. We are also working on improving the validations based on users' feedback. We also concentrate efforts on improving the central SDD architecture by making the architecture more robust, developing REST APIs.

REFERENCES


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