CONFIGURATION SYSTEM OF THE NSLS-II BOOSTER CONTROL SYSTEM ELECTRONICS

Configuration information for any control systems comprises a large amount of data with non-trivial relations and dependencies...

**MAGNETIC SYSTEM**

- **Power supplies:** 68
- **Power supply types:** 6
- **Power Supply Controllers (PSC):** 44
- **IO channels per PSC:** 44
- **Σ(hardware IO channels):** 836
- **Total channels (hw + sw):** ~5k
- **IOCs:** 6
- **Servers:** 1
- **IOC’ start scripts:** 762 kB

Creation and support of such amount of information is problematic without some means of automation.

**PyCDB** is a specialized tool, enabling centralized creation, editing and automated export to local storages information required for control system configuration.

**DATA MODEL**

- **Logical association**
- **Is in instance of**
- **Composition**

Data model allows to describe a structure of whole configuration information in the unified form by defining:
- entities with attributes;
- links between them;
- types of links;
- directions;
- multiplicity.

PyCDB significantly decreases control system maintenance costs and minimizes human factor-related problems.

**SOFTWARE ARCHITECTURE**

Three-layer architecture incorporates High Level Applications, IOCs and Hardware

- Ramp Manager
- Orbit Correction
- Compil code

Three levels of PVs correspond to the three control levels:
- Power Supply Controller;
- Power Supply Unit;
- magnet(s).

**CONFIGURATION INFORMATION GRAPH**

PSC 01 – Bend 01 [Connector]

Channels

ps-br-septum [IOC]

ps-br-bend [IOC]

ps-br-quad [IOC]

ps-br-dceptum [IOC]

ps-br-kicker [Server]

psloc-br-rgb [IOC]

PSC 02 – Bend 02 [Connector]

PSC-Bend [Connector Type]

PSC-Bend p.01

PSC-Bend p.02

PSC-Bend p.03

Logical association

Is in instance of

Composition

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