BLED: A top-down approach to accelerator control system design

Jaka Bobnar
Klemen Žagar
## Bottom-up vs. Top-down

<table>
<thead>
<tr>
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<td>Easier to outsource</td>
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<td>Unified interfaces</td>
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**Balance is best**
Top-Down Approach

- Lattice Designers
- Control System Developers
- Purchasing Teams
- CAD Designers
- Mechanical Engineers
- Installation and Maintenance Teams

System Model Database

- XAL configuration XML files
- TraceWin/GenLinWin
- EPICS Configuration Database Files
- Service configuration: naming service, gateway(s), channel archiver(s)
- Reports, etc.
- Survey
- MAD
Enforcing naming convention presents a high organizational risk

- Try to automate naming of components as much as possible
- System takes care of names verification during import
What is BLED?
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BeamLine
Element
Database
What is BLED?
What is BLED?
What is BLED?

Beamline Element Database

BEAST BEAUTY BOY Best and Leanest* Ever Database
What is BLED?

Beamline Element Database

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* Lean & mean
What is BLED?

- Lattice database
- Machine parameters database
- Inventory database
- Control system configuration database
- Set of tools to work with the database
Database Schema
Lattice

- Complete information about the accelerator lattice
  - Every device is a subsystem
  - Contains physical, geographical & geometrical data

- Import data from lattice design tools
  - MAD,
  - TraceWin,…

- Allows export to different formats
  - Lattice design tools
  - Survey data
Inventory

- Lists every single piece of equipment in the system
  - Desktops, racks,…
- Infrastructure
  - Buildings, rooms,…
- Cabling
  - All interconnections within the machine
Control System Configuration

- Focused on EPICS
  - IOC applications
  - EPICS database templates with channels (and fields)
  - EPICS macro substitutions
  - List of configurations for archive & alarm systems
- All channels have relations to the inventory part
- All entities are versioned, history is stored in the database
Machine Parameters

- Non-physical description of equipment
  - Energy, minimum spot size …

- Associated with personnel tables, subsystems,…

- Will replace the parameters list excel sheets in ESS
BLED Tools

- Required for maintenance and import/export
  - Bulk imports, single entries
- Perform verification of the database and all imports so they comply with the rules
- Implemented using web technologies (GWT)
Future Plans?
Future Plans?
THANK YOU!

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