

D.P. JAROSZ, S. VESELI, N.D. ARNOLD, J. CARWARDINE, G. DECKER, N. SCHWARZ



THE EVOLUTION OF COMPONENT DATABASE FOR APS- UPGRADE



DARIUSZ JAROSZ

Scientific Software Engineering & Data Management
Advanced Photon Source

10/10/2017

Barcelona, Spain - ICALEPCS 2017

OVERVIEW

- What is Component Database
- The path to a generic schema
- New Functionality
 - Plugin Framework
 - Traveler Integration
 - Custom Views
 - Browse Pages
 - Multi-Edit Multi-Create Pages
- Future Plans
- Project is now on GitHub

WHAT IS COMPONENT DATABASE (CDB)

- Document & manage all parts for the upgraded facility.
- Primary Domains
 - Catalog
 - Inventory
- Web Portal
 - Data entry
 - Browsing
- REST Web Service
 - Python API
 - DB APIs

The screenshot displays the Argonne Component Database Portal interface. At the top, the Argonne National Laboratory logo is on the left, and the text 'Component Database Portal' is in the center. On the right, it shows 'Username: Not Logged in', 'Role: User', 'Nav: Default', and 'Project: A3'. Below the header, there are navigation tabs for 'Browse', 'Catalog', and 'Inventory', along with a search bar and 'Login' and 'About' links.

On the left side, there is a sidebar titled 'Choose a Technical System' with a tree view of categories including ACIS, APS-U Machine Design, Beam Functional Components, Control/Instrumentation, Diagnostics, Front Ends, Generic Functions/Placeholders, Lattice Elements, Magnets, Mechanical/Beamlines, Mechanical/Insertion Devices, Power/Surfaces, Functions, All, Corrector, Dipole, Girdler, Magnet Component, Q-band, Quadrupole, R-Bend, Sextupole, Stand, Teststand, and Trim.

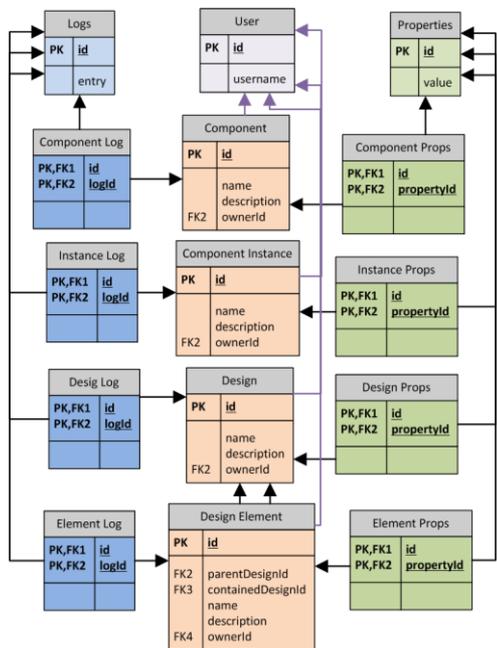
The main content area features a table with the following columns: Assy, Primary Image, Name, Model Number, Alternate Name, Description, and Inventory. The table lists various components, including DMM QUADRUPOLE COIL ASM, DMM QUADRUPOLE U221020202-111100, DMM QUADRUPOLE U221020202-113100, DMM QUADRUPOLE U221020202-114100, DMM QUADRUPOLE U221020202-115100, PROTOTYPE Q8 QUADRUPOLE, Q1 Production Magnet, and YOKE: DMM QUADRUPOLE Q6A093.

Two 3D model pop-ups are visible: 'Q1 Production Magnet' showing a blue and yellow assembly, and 'PROTOTYPE Q8 QUADRUPOLE' showing a photograph of a physical component on a workbench.

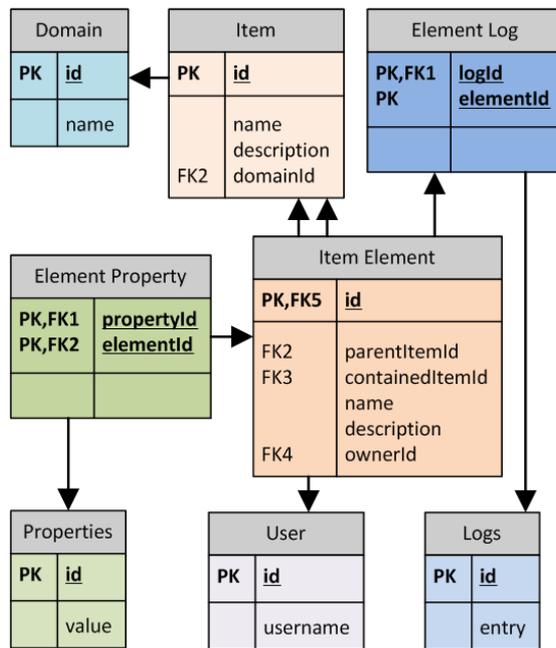
Copyright © 2014-2016 UChicago Argonne, LLC

PATH TO GENERIC SCHEMA

Diagrams show represent same functionality in generic and non-generic schema*.



- Less schema changes
 - New domains
 - Generic relationships
- High code reuse



*Does not show actual schema but represents ideas in the schema

NEW FEATURES

PLUGIN FRAMEWORK

- Open Source
- Property Values
 - Communication with external system
 - Custom interfaces
- Add item to CDB using plugin
- About Page
 - Links & custom interface

TRAVELER INTEGRATION

Enables tracking procedure, inspection, and other data for inventory.

FRIB TRAVELER SYSTEM

- Templates
- Traveler instances

COMPONENT DATABASE

- Catalog items
- Inventory items

- Custom Interfaces directly in CDB
 - Template
 - Create & Link
 - Traveler Instance
 - Create, Update, Monitor
- Tasks completed in FRIB system
 - Designing a template
 - Filling out traveler instance

| Traveler Instance Information | |
|--|-----------------------------------|
| Traveler Instance Title | S1A001 EAA to 314 |
| Status | Submitted |
| Created By | adonnelly |
| Created On (UTC) | 2016-03-11T14:28:26.817Z |
| Updated By | jabraham |
| Updated On (UTC) | 2016-03-11T19:15:13.250Z |
| Deadline (UTC) | 2016-03-11T06:00:00.000Z |
| Estimated Traveler Progress | |
| <div style="width: 21/34; height: 10px; background-color: #0070c0;"></div> 21/34 | |



Traveler title: S1A001 EAA to 314

Status: submitted

Devices: **DMM SEXTUPOLE S1A001 [S1A001] (QRID: 108)**

Show validation Hide validation Show notes Hide notes De

Cost Code: 7102122-133-U2-0201020202.D

history: changed to 7102122-133-U2-0201020202.D

notes: 0 1

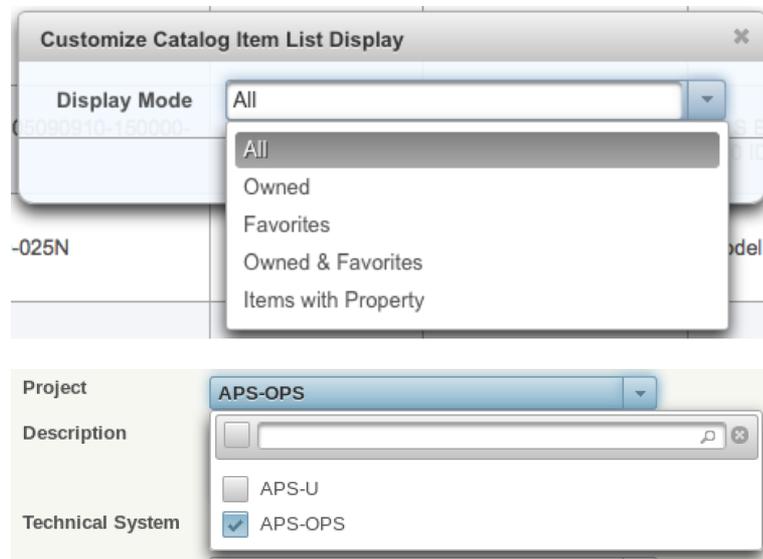
Location of lift: EAA MOM group shop

history: changed to EAA MOM group shop by

notes: 0 1

CUSTOM VIEWS

- View customizations in CDB
- Columns
 - General Information
 - Permissions
 - Properties
- New Features
 - Mark as favorites
 - Display modes
 - Assign items to projects
 - User & group views



BROWSE PAGES

- Standardized browsing method
- SQL Query Based
- Browse By:
 - Function
 - Ownership
 - Location

Choose a Technical System

- ACIS
- APS-U Machine Design
- Beam Functional Components
- Controls/Instrumentation
- Diagnostics
- Generic Functions/Placeholders
- Lattice Elements
- Magnets**
- Mechanical/Beamlines
- Mechanical/Insertion Devices
- Power Supplies

Functions

- All
- Corrector
- Dipole
- Girder
- Magnet Component
- Q-bend
- Quadrupole
- R-Bend
- Sextupole**
- Stand
- Teststand

| Assy | Primary Image | Name | Model Number | Alternate Name | Description | Inventory | |
|------|---|---------------------------------------|-------------------|----------------|------------------------------------|---|---|
| |  | DMM Sextupole Coil | | | Sextupole Coil Data | DMM Sextupole #0 DMM Sextupole #1 DMM Sextupole #2 DMM Sextupole #3 DMM Sextupole #4 DMM Sextupole #5 DMM Sextupole #6 Raw Data Report | ★ |
| ⓘ |  | DMM SEXTUPOLE S1A001 | U221020202-112000 | | LATTICE V3 Sextupole S1 Design | S1A001 | ★ |
| |  | S1 Magnet Yoke | | | Yoke for S1 magnet DMM | | ★ |
| | ○ | Sextupole 0.186m | | | | | ★ |
| | ○ | Sextupole 0.248m | | | | | ★ |
| | ○ | u221020202-104000.drw | | | Drawing for part u221020202-104000 | | ★ |

Copyright © 2014-2017 UChicago Argonne, LLC

MULTI-EDIT MULTI-CREATE PAGES

- Time Saver
- Spreadsheet style editing
- Edit
 - Select existing items
- Create
 - Specify quantity of items
- Editable attributes
 - General
 - Permissions
 - Properties
- Quick apply to all functionality

Create Configuration Update New Items

General

Select desired item columns to edit

- Model Number
- Alternate Name
- Project
- Description

Permissions

Properties

| Name | Model Number | Group Writeable | QA Level | Action |
|--|---------------|-----------------|----------|-----------|
| 20 kV Attenuator | ATF 20-025N | No | A | ✎ + ✕ ✕ ☰ |
| 3458A DVM | 20-025N | No | C | ✎ + ✕ ✕ ☰ |
| 8 ch 18-bit DAC | | No | D | ✎ + ✕ ✕ ☰ |
| 8 Gigabyte Flash Disk Module for AM31x | | No | A | ✎ + ✕ ✕ ☰ |
| AM31x MicroTCA CPU | 35-ID-C | No | C | ✎ + ✕ ✕ ☰ |
| AMC-V7-2C6678 MicroTCA DSP/FPGA | AM 310/302-52 | No | B | ✎ + ✕ ✕ ☰ |

← Previous Step

Copyright © 2014-2017 UChicago Argonne, LLC

FUTURE PLANS

- Domains
 - Machine Design
 - **M**easurement and **A**nalysis **ARC**hive (MAARC)
- Mobile App
- QA Processes

NOW ON GITHUB

- Try CDB at your facility, find it on GitHub at <https://github.com/AdvancedPhotonSource/ComponentDB>
- Easy deployment scripts
 - Developed for Red Hat Linux but will work with more distributions.
- Deployment instructions can be found in the GitHub Readme.md file

 [AdvancedPhotonSource / ComponentDB](https://github.com/AdvancedPhotonSource/ComponentDB)

NOW ON GITHUB

- Try CDB at your facility, find it on GitHub at <https://github.com/AdvancedPhotonSource/ComponentDB>
- Easy deployment scripts
 - Developed for Red Hat Linux but will work with more distributions.
- Deployment instructions can be found in the GitHub Readme.md file

 [AdvancedPhotonSource / ComponentDB](https://github.com/AdvancedPhotonSource/ComponentDB)

- Thank You. Questions?

**THE SUBMITTED MANUSCRIPT HAS BEEN CREATED BY UCHICAGO ARGONNE, LLC, OPERATOR OF ARGONNE NATIONAL LABORATORY ("ARGONNE"). ARGONNE, A U.S. DEPARTMENT OF ENERGY OFFICE OF SCIENCE LABORATORY, IS OPERATED UNDER CONTRACT NO. DE-AC02-06CH11357. THE U.S. GOVERNMENT RETAINS FOR ITSELF, AND OTHERS ACTING ON ITS BEHALF, A PAID-UP NONEXCLUSIVE, IRREVOCABLE WORLDWIDE LICENSE IN SAID ARTICLE TO REPRODUCE, PREPARE DERIVATIVE WORKS, DISTRIBUTE COPIES TO THE PUBLIC, AND PERFORM PUBLICLY AND DISPLAY PUBLICLY, BY OR ON BEHALF OF THE GOVERNMENT. THE DEPARTMENT OF ENERGY WILL PROVIDE PUBLIC ACCESS TO THESE RESULTS OF FEDERALLY SPONSORED RESEARCH IN ACCORDANCE WITH THE DOE PUBLIC ACCESS PLAN.
[HTTP://ENERGY.GOV/DOWNLOADS/DOE-PUBLIC-ACCESS-PLAN](http://energy.gov/downloads/doe-public-access-plan)**