

APS-U Component Database eTraveler

...

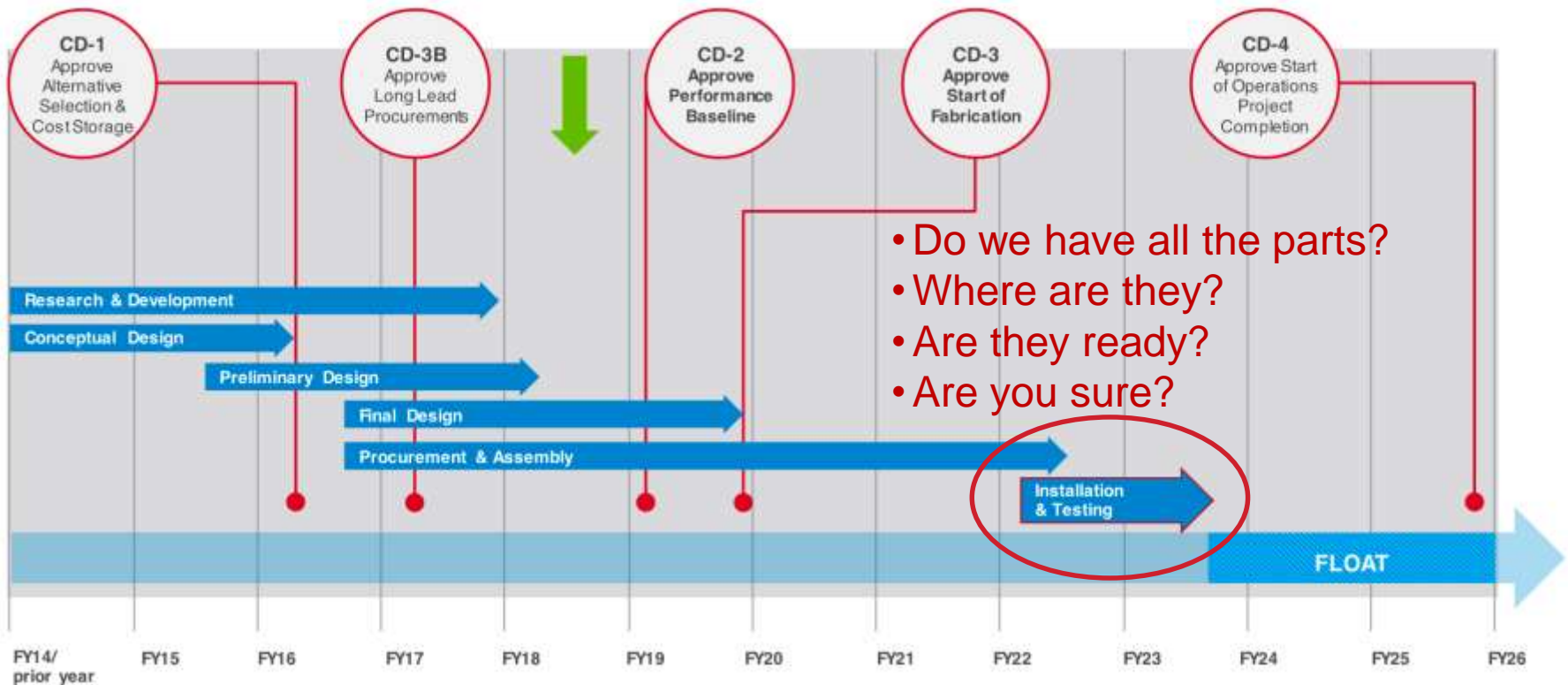


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Argonne National Laboratory

EPICS Collaboration Meeting @ APS
June 15, 2018

The Need ...

APS Upgrade Project Schedule



The Need ...



Integrated Relational Model of Installed Systems

Web Desktop

- AC Power Info
- AOI Info
- Component Type Info
- IOC Info
- Network Info
- PLC Info
- Racks Info
- Server Info
- Spares Info
- Component History
- Web Desktop Help

IRMIS Desktop (idt)

- idt: PV Info
- idt: IOC
- idt: Component
- idt: Component-Type
- idt: Cables
- idt Help

Global Search Tool

Database Server:
ctlrdbprod:irmis
Application Server:
ctlappsirmis



Component Database (CDB)



Component Database Portal

Username: Not Logged In
Role: User
View: Default
Project: All

Browse ▾ Catalog Inventory

Search Login ? About

What Does It Do ?

- **Assists staff** in tracking components
 - Provides a mechanism to associate drawings, documents, specifications, requisitions, ... to a component
 - Define additional properties that a set of components have in common
 - Allows for identifying and tracking inventory items (where installed, repair record, periodic maintenance, ...)
 - Captures installed components (type / instance / location)
- **Allows for “Project-wide” processes** to be applied
 - Common naming conventions (good luck)
 - QA Properties and work flow
 - Organizing of eTravelers

Component Database (CDB)



Component Database Portal

Username: Not Logged In
Role: User
View: Default
Project: All

Browse ▾ Catalog Inventory

Vocabulary

Search Login ? About

- What is a "component"?
 - Something you design
 - Something you buy
 - Something you build/assemble
 - Something you refer to ... even if it doesn't exist
- What do you call it?
 - Part / assembly / widget / ...
 - Component / component-type / component instance / ...
 - Configuration item / lattice element / accelerator component / ...

Component Database (CDB)



Component Database Portal

Username: Not Logged In
Role: User
View: Default
Project: All

Browse ▾ Catalog Inventory

Vocabulary

Search Login ? About

Catalog

(each unique *type of component or component design or COTS item* + properties/drawings/specification/..)



Inventory

(each unique *instance of component* procured or fabricated) + properties/serial #/QR code/travelers/pictures/...)



Machine Designs

(A group of catalog components to perform a particular function + inventory items to build it + Properties/pictures/locations/...)

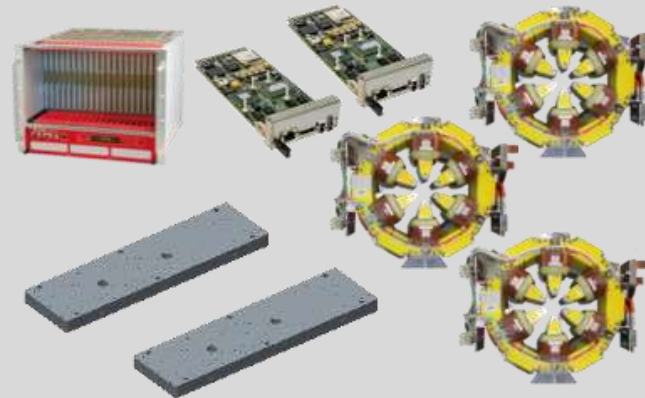


Shop Laptops by Type

2-in-1s Built for Power Gaming Solid State Drives Less Than \$500 Windows

Computer Savings Save up to \$150 on select Windows computers. Click to the link page with a new computer. Minimum savings is \$50. Shop these computers.

MacBook Savings MacBook Pro Save up to \$250 on select models. Minimum savings is \$50. Shop MacBook Pro.



Component Database (CDB)

WARNING!!!! THREE DIFFERENT NAME SPACES!!!!

Vocabulary

Project: AI

Browse Catalog Inventory

Search Login About

Catalog Item

DMM Quadrupole



Machine Design

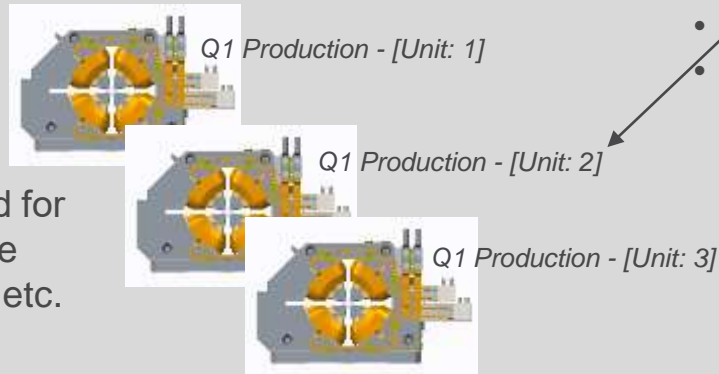


Machine Design Item is a place holder or "address". It has ...

- A reference to a Catalog Item
- A reference to an Inventory Item
- It's own properties, history, etc.

Inventory Items:

Specific units of "DMM Quadrupole" can be tracked for inspection, testing, where installed, maintenance log, etc.



Component Database (CDB)

WARNING!!!! THREE DIFFERENT NAME SPACES!!!!

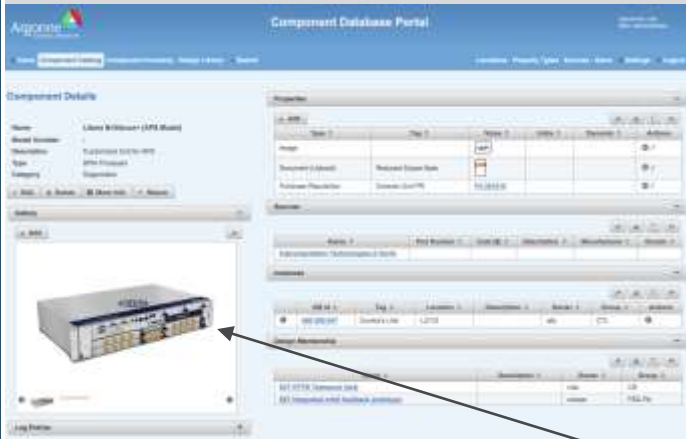
Vocabulary

Browse Catalog Inventory

Search Login About

Catalog Item

Libera Brilliance+ (APS Model)



Machine Design



Inventory Items:
Specific units of "Libera Brilliance+ (APS Model)" can be tracked for inspection, testing, where installed, maintenance, etc.



- Machine Design Item is a place holder or "address". It has ...
- A reference to a Catalog Item
 - A reference to an Inventory Item
 - It's own properties, history, etc.

Catalog Entry

Browse **Catalog** Inventory

Search Login About

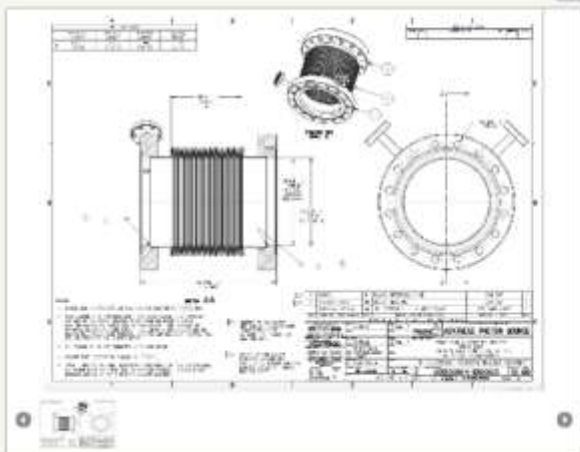
Catalog Item Details

Common Properties

Name BELLOWS ASSEMBLY
Model Number U2520104-120000-00
Alternate Name IM1 Electrical Feedthru Bellows
Project APS-U
Description FRONT ENDS & INSERTION DEVICES FRONT ENDS HIGH HEAT LOAD FRONT ENDS (HHLFE) HHLFE VACUUM COMPONENTS
Technical System Front Ends
Function Bellows

More Info Permalink Return

Gallery



Log Entries

Optional Properties

Properties

| Type | Value | Description | Tag | Actions |
|-----------------|---------------------------------|-------------|-----|---------|
| PDMLink Drawing | U2520104-120000 | | | |
| Image | | | | |

eTraveler Templates

| Title | Created By | Created On | Updated By | Updated On | Actions |
|---|------------|--------------------------|------------|--------------------------|---------|
| U2520104-120000-00 Bellows ACL and Traveler | dwilkin | 2018-02-22T15:06:09.932Z | dwilkin | 2018-02-22T15:33:48.252Z | |
| AES MOM Vacuum Leak Check | jzientek | 2017-11-01T16:26:33.107Z | jzientek | 2018-02-16T20:47:56.622Z | |
| AES MOM Vacuum Bake Out | jzientek | 2017-11-01T17:09:58.865Z | jzientek | 2018-02-16T20:49:52.931Z | |

Assembly Listing

Sources

Inventory

| More Info | Primary Image | Tag | QrId | Serial Number | Description | Location | Actions |
|-----------|---------------|-----------------------|-------------|---------------|-------------|----------|---------|
| | | BL1-1 | 000 000 147 | | | 382 | |
| | | BL1-2 | 000 000 148 | | Spare | 382 | |

Item Membership

Inventory Entry

Browse - Catalog **Inventory**

Search Login About

BELLOWS ASSEMBLY - [BL1-1]

Common Properties

Tag: BL1-1
QR Id: 000 000 147
Catalog Item: [BELLOWS ASSEMBLY](#)
Serial Number: -
Project: APS-U | APS-U Production
Description: -
Location: 382

Location Details

More Info Permalink Return

Gallery



Log Entries

Optional Properties

Properties

| Type | Value | Description | Tag | Actions |
|----------------------|-----------------------------------|-------------|-----|---------|
| Effort Cost Code | PRJ1000956 U2-EQ-133-INT-050206.F | | | |
| Purchase Requisition | F7-233041 | | | |
| Image | | | | |

eTraveler Instances

| Title | Description | Created By | Updated By | Created From Template | Estimated Progress | Action |
|--|-------------|------------|------------|-----------------------|--------------------|--------|
| Initial Inspection Travelers | | dwilkin | dwilkin | N/A - Binder | 0.0/30.0 | |

Assembly Listing

Item Membership

Catalog Item Properties

| Type | Value | Description | Tag | Actions |
|-----------------|---------------------------------|-------------|-----|---------|
| PDMLink Drawing | U2520104-120000 | | | |
| Image | | | | |



APS / CDB
000 000 147

Inventory Entry



Browse using Common Properties



Browse - Catalog Inventory

Links to
Catalog
Items

Component Database Portal

Links to
Inventory
Items

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
- RF

Functions

- Corrector
- Dipole
- Grid
- Magnet Component
- Q-bend
- Quadrupole
- R-Bend
- Sextupole
- Stand
- Teeteland

| Assy | Primary Image | Name | Model Number | Alternate Name | Description | Inventory |
|------|---------------|---|-------------------|----------------|--|---|
| | | DMM Top Level Design (#1) | | | Top level design of the Dummy Modular Multiplet prototype | |
| | | DMM MAGNET SUPPORT PLATE U221020202-110001 | U221020202-110001 | | SUPPORT PLATE FOR DMM MAGNETS, INTERFACE TO DMM SUPPORTS AND VACUUM COMPONENTS | DMM-SUPPORT-PLATE-A001 |
| | | DMM QUADRUPOLE COIL_ASM | U221020202-104000 | | DMM QUADRUPOLE COIL | |
| | | DMM QUADRUPOLE U221020202-111100 | U221020202-111100 | | QUADRUPOLE ASSEMBLY, STEEL POLES | DMM-QUADRUPOLE-A001 |
| | | DMM QUADRUPOLE U221020202-113100 | U221020202-113100 | | QUADRUPOLE ASSEMBLY, STEEL POLES, EDM, SYNCHROTRON VACUUM CHAMBER CUTOUT | DMM-QUADRUPOLE-A002 |
| | | DMM QUADRUPOLE U221020202-114100 | U221020202-114100 | | DMM QUADRUPOLE ASSEMBLY, VP POLES | DMM-QUADRUPOLE-A003 |
| | | DMM QUADRUPOLE U221020202-115100 | U221020202-115100 | | QUADRUPOLE ASSEMBLY, STEEL MUSHROOM POLES, EDM | DMM-QUADRUPOLE-A004 |
| | | 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 |
| | | M1 dipole pre-prototype | | | First prototype magnet (from Fermilab) | First Unit (from Fermilab) |
| | | M4 Potting Mold Assembly | u221020205-112300 | | | M4 Potting Mold Assembly |
| | | M4 Trim Coil Winding Fixture Assembly | u221020205-112200 | | | M4 Trim Coil Winding Fixture Assembly |
| | | M4 Winding Fixture Assembly | u221020205-112100 | | | M4 Winding Fixture Assembly |
| | | Prototype 8-Pole Corrector | | | Prototype 8-Pole Fast Corrector built by BNL | Unit: 1 |
| | | PROTOTYPE M4 TRANSVERSE GRADIENT QUADRUPOLE | U221020205-200000 | | PROTOTYPE M4 TRANSVERSE GRADIENT QUADRUPOLE | M4-PROTOTYPE |
| | | PROTOTYPE Q8 QUADRUPOLE | U221020205-130000 | | PROTOTYPE Q8 QUADRUPOLE | Unit: 1 Unit: 2 |
| | | Quadrupole 0.213m | | | | |
| | | Quadrupole 0.259m | | | | |
| | | Quadrupole 0.401m | | | | |
| | | Quadrupole 0.568m | | | | |

Features ...

The screenshot shows the Argonne Component Database Portal interface. A 'Customize Catalog Item List Display' dialog box is open, showing a 'Display Mode' dropdown menu with options: All, Owned, Favorites (selected), Owned & Favorites, and Items with Property. The main page header includes the Argonne logo, 'Component Database Portal', and user information: 'User: Administrator', 'Role: Administrator', 'View: All', and 'Export: All'. Navigation buttons include 'Browse -', 'Catalog', 'Inventory', 'Search', 'Administrative -', 'Settings', 'Logout', and 'About'. The 'Catalog Item List' section has a 'Display Mode: Favorites' button circled in red. Below the dialog, there are buttons for '+ Add', '+ Add from PDMLink', 'Create Multiple Items', and 'Edit Multiple Items'. A table of catalog items is displayed with columns: More info, Primary Image, Name, Model Number, Function, Technical System, Description, and Action. The 'Action' column is circled in red. The table contains the following items:

| More info | Primary Image | Name | Model Number | Function | Technical System | Description | Action |
|-----------|---------------|--|-----------------|-----------------------------|--------------------------|---|--------|
| | | BpmRfShieldedBellowsAssy1 | | BPM | Diagnostics | Bolted assembly of furnace-brazed Cu and BeCu liner, and SST 316L edge-welded bellows with... | |
| | | M1 dipole pre-prototype | | Dipole | Magnets | First prototype magnet (from Fermilab) | |
| | | DCCT Burden Resister Chassis | | Current Monitor | Diagnostics | Temperature Controlled Burden Resister Assembly, includes power supply. | |
| | | Q1 Production Magnet | U2330101-100000 | Quadrupole | Magnets | APS-U Production Q1 | |
| | | 001 - CDB Test Component | A11-001 | Adapter ADC Amplifier | Controls/Instrumentation | Q1 Production Magnet Design | |
| | | Q2 Production Magnet | U2330101-200000 | Quadrupole | Magnets | APS-U Production Q2 | |

- Numerous view features can be customized for an individual or a group
 - Item filters
 - Columns displayed
 - Rows per page
 - Favorites / Owned / ...

Features ...

■ User Interfaces

- Web Portal
- Customized views for individuals and groups
- REST Web Service (Python and Java APIs)
- Command Line Interfaces (built on top of Python APIs)
- Mobile Apps (in development)



The screenshot displays the Argonne Component Database Portal interface. The main content area is titled "Catalog Item Details" and shows the following information:

- Name: AMC34E Xilinx Virtex-7 FPGA AMC with Dual DSP
- Model Number: AMC34E-012-101-200
- Alternate Name: -
- Project: APS-U
- Description: AMC34E Xilinx Virtex-7 FPGA AMC with Dual TMS320C67X5 DSP
- Technical System: Diagnostics / Controls/Instrumentation
- Function: Module / FPGA / DSP

Below the details is a "Gallery" section containing an image of the hardware component. To the right, there are several data tables:

- Properties:** A table with columns for Type, Value, Description, Tag, and Actions.
- Assembly Listing:** A table with columns for Base, Part Number, Cost (\$), Description, Manufacturer, and Weight.
- Inventory:** A table with columns for Name, Primary ID#, Tag, Cost, Serial Number, Description, Location, and Actions.

■ Privileges

- Authentication: APS LDAP
- Authorization: Users are members of one or more CDB-defined groups. You can modify entities you own and entities owned by your CDB-defined group if they are set to “group writable”.
- Administrators: Certain tables can only be modified by Users assigned to the CDB_ADMIN group

Features ...

■ Properties

| Catalog Items | Inventory Items | Machine Design Items |
|---|--|---|
| Name | Name | Name |
| Model Number | Tag | Machine Tag |
| Alternate Name | Catalog Item (automatic) | |
| Description | Description | Description |
| Project | Project | Project |
| Technical System | QR # | |
| Function | Serial Number | |
| Sources (Vendors) | Location | Location |
| | Location Details | Location Details |
| << Optional Properties >> Links to Drawings & Documents Images Web Links Uploaded Documents Form Factor eTraveler Templates QA Level QA Requirements Link to Software Support Modules | << Optional Properties >> Purchasing Info Images Uploaded Documents Revision # eTraveler Instances Inspection Results Test/Measurement Results | << Optional Properties >> IP # Host Name GPIB Address VME/VXI Configuration Location in Rack Radiation Safety Component Link to Source Code |

Features ...

■ Catalog Item Classifications

- Classifications allow catalog components to be grouped by technical system, function, or ownership. If categorized carefully, items can be found expediently
- **Function:** generic function(s) that the component performs (e.g. stand, magnet, ADC, vacuum chamber, etc)
- **Technical System:** Items are further grouped into “Technical Systems” which are intended to group component types by discipline (e.g. Diagnostics, Controls, Accelerator, Beamline, RF, ...)

The screenshot displays the Argonne National Laboratory catalog interface. At the top, the Argonne logo is visible. Below it, there are navigation tabs for 'Browse', 'Catalog', and 'Inventory'. A dropdown menu is open under 'Browse', showing options: 'Browse By Function', 'Browse By Ownership', and 'Browse By Location'. Below the dropdown, there are two lists of categories:

- Categories:** Controls/Instrumentation, Diagnostics, Generic Functions/Placeholders, Lattice Elements, Magnets (highlighted), Mechanical/Beamlines, Mechanical/Insertion Devices, Power Supplies.
- Functions:** All (highlighted), Corrector, Dipole, Girder, Magnet Component, Q-bend, Quadrupole, R-Bend, Sextupole, Stand, Teststand.

To the right, a table displays catalog items with columns for 'Assy', 'Primary Image', and a link column. The table contains several rows, each with a small image and a link.

| Assy | Primary Image | |
|------|---------------|--|
| 0 | | DM |
| | | DM U2 |
| | | DM |
| 0 | | DM |
| 0 | | DM |
| 0 | | DM |
| 0 | | DM |
| | | DM |

Features ...

■ Properties

- Properties provide a flexible mechanism for capturing object-dependent information (e.g. not all components will have the same meta-data)

| | | |
|---|---------------|------------|
| AMOS Order | Documentation | AMOS Link |
| Document/Drawing (ICMS) | Documentation | ICMS Link |
| Document/Drawing (Upload) | Documentation | Document |
| Documentation URI | Documentation | HTTP Link |
| EDP Collection | Documentation | EDP Link |
| Image | Documentation | Image |
| PDMLink Drawing | Documentation | PDMLink |
| Purchase Requisition | Documentation | PARIS Link |

- Property types may be associated with a restrictive set of “allowed” property values

Property Type Details

Allowed Property Values

| Name | QA Level |
|---------------|------------------------------------|
| Description | Enumerated values of A B C D |
| Id | 2 |
| Category | QA |
| Handler | |
| Default Value | D |
| Default Units | |

| Value | Units | Sort Order |
|-------|-------|------------|
| A | | 1.0 |
| B | | 2.0 |
| C | | 3.0 |
| D | | 4.0 |

- Property types may be linked to unique a “handler”, which adds specific functionality to that property

- ICMS Handler, PARIS Handler, PDMLink Handler, ...

- A time-stamped history of each property value is kept to provide a historical log

Property Value History: Electrical Equipment Status

| Tag | Value | Units | Description | Entered By | Entered On |
|-----|---------------------------|-------|--------------------|------------|------------------------------|
| | APS Inspection - Approved | | Inspection # 22312 | nda | Tue Oct 13 09:13:55 CDT 2015 |
| | APS Inspection Required | | | nda | Tue Oct 13 09:12:39 CDT 2015 |

Features ...

■ Assemblies

- A simple hierarchy of components can be created
 - Discussion Starter: Should you create “assemblies” in the Catalog or in the Machine Design?

The screenshot displays the 'Component Database Portal' interface. The main content area is titled 'Catalog Item Details' and shows information for a 'MicroTCA Chassis Assembly'. The details include: Name (MicroTCA Chassis Assembly), Model Number (-), Alternate Name (-), Project (APC-U), Description (Includes chassis, 2 fan units, power supply), Technical System (Diagnosis / Controls/Instrumentation), and Function (Card Cage). Below this is a 'Gallery' section with a 'Log Entries' dropdown. To the right, there are sections for 'Properties', 'Elements', 'Sources', 'Inventory', and 'Item Membership'. The 'Elements' section contains a table with columns for Element Name, Contained Item, Model Number, and Required.

| Element Name | Contained Item | Model Number | Required |
|--------------|---------------------------------------|--------------|----------|
| PSU | MicroTCA 4 Power Supply | | Yes |
| FU1 | MicroTCA Chassis Fan Unit | | Yes |
| FU2 | MicroTCA Chassis Fan Unit | | Yes |
| Chassis | Sub of MicroTCA Chassis (chassis.cmp) | | Yes |

■ Mini-logbooks

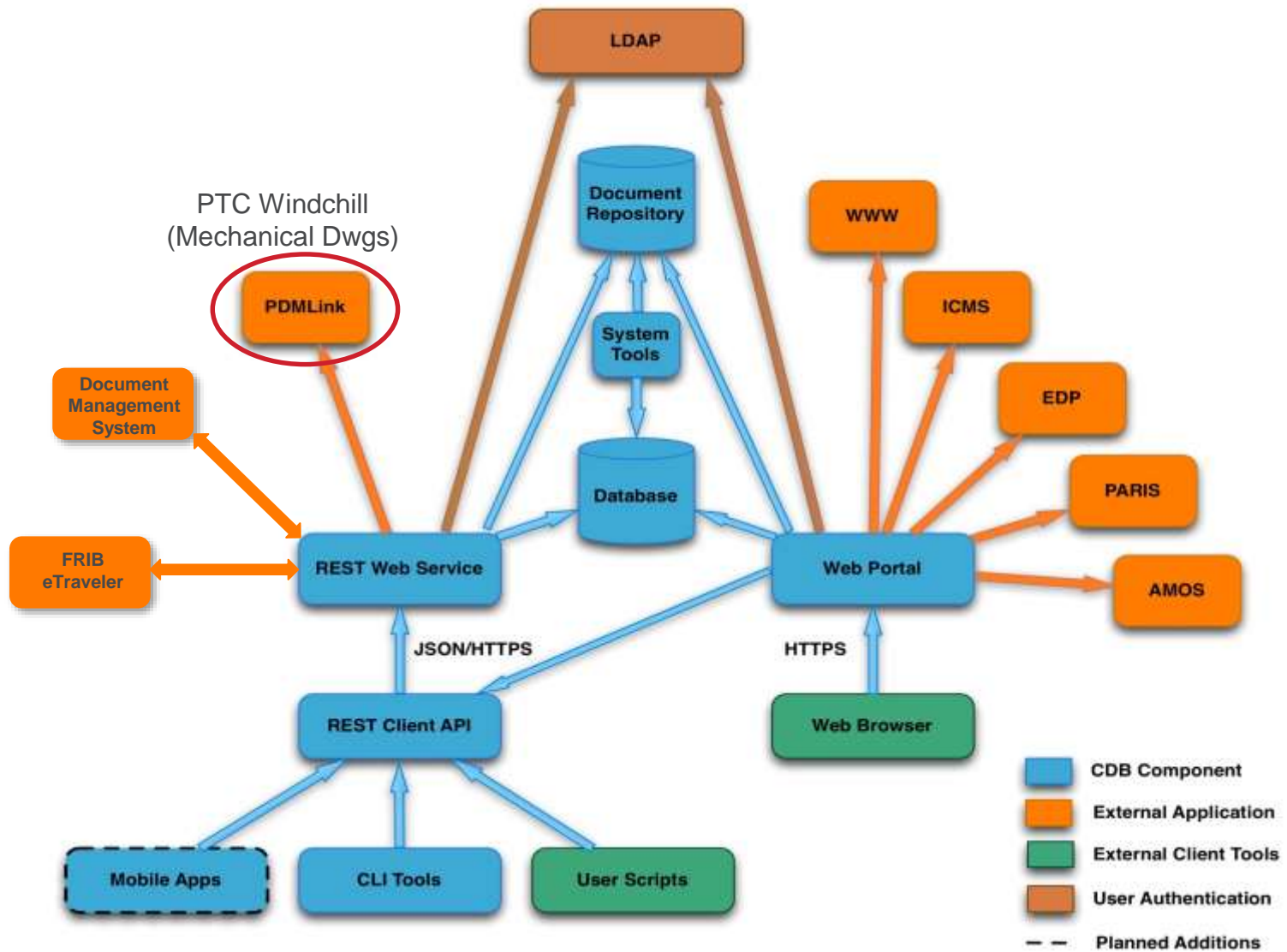
- Chronological log entries for each item *in all domains*
- Upload an attachment to a log entry

The screenshot shows the 'Log Entries' section for the 'MicroTCA Chassis Assembly'. It features a 'Log Entries' dropdown menu and a table of log entries. The table has columns for Time, User, Log Entry, and an icon. The first entry is dated 03/23/15 11:08 and is by user 'nda'. The second entry is dated 03/19/15 15:53 and is by user 'nda'.

| Time | User | Log Entry | |
|----------------|------|---|--|
| 03/23/15 11:08 | nda | Updated the firmware per the "Firmware Update Instructions" document ... the fu_start command from the MCH now starts the CPU properly. Two changes to the instructions: after booting from the USB, cd c:\bios . Also, the second "cd" command should be "fu". | |
| 03/19/15 15:53 | nda | Sherry performed the "Removing Extended Options Region I/O" (see documents) modification so the AMC-V7 DSP board could safely be installed in the same chassis. | |

Features ...

Component Database System Components



Features ...

■ Integration with Mechanical Drawing Repository

Argonne NATIONAL LABORATORY

Component Database Portal

Username: rds
Role: Administrator
View: rds
Project: All

Browse - Catalog Inventory

Search Administrative Settings Logout About

Catalog Item List

Display Mode: All

+ Add **Add from PDMLink** Create Multiple Items Edit Multiple Items

Search for PDMLink Drawing

U1520205-

Search Help

Search Results:

| Number | Date Modified |
|------------------------------------|--------------------------|
| FODO_GATE_VALVE_SUPPORT_CLAMP.PRT | 23 Jun 2017 20:46:33 GMT |
| FODO_GATE_VALVE_SUPPORT_PUSHER.PRT | 23 Jun 2017 20:46:33 GMT |
| FODO_GV_SUPPORT_SLIDER_V.PRT | 23 Jun 2017 20:46:33 GMT |
| U1520205-200000.ASM | 28 Jun 2012 13:51:36 GMT |
| U1520205-200000.DRW | 28 Jun 2012 16:19:01 GMT |
| U1520205-200001.PRT | 28 Jun 2012 16:19:01 GMT |
| U1520205-200002.DRW | 28 Jun 2012 16:19:01 GMT |
| U1520205-200002.PRT | 16 Mar 2017 18:15:29 GMT |
| U1520205-200003.DRW | 2 Aug 2013 14:29:00 GMT |
| U1520205-200003.PRT | 6 Mar 2017 23:52:10 GMT |
| U1520205-200004.DRW | 2 Aug 2013 14:30:10 GMT |
| U1520205-200004.PRT | 6 Mar 2017 23:56:13 GMT |
| U1520205-201000.ASM | 28 Jun 2012 13:51:36 GMT |
| U1520205-201000.DRW | 28 Jun 2012 16:19:01 GMT |
| U1520205-201001.DRW | 28 Jun 2012 16:19:01 GMT |
| U1520205-201001.PRT | 28 Jun 2012 13:51:36 GMT |
| U1520205-201002.DRW | 28 Jun 2012 16:19:01 GMT |
| U1520205-201002.PRT | 13 Apr 2017 13:28:00 GMT |

Drawing Details

Number: U1520205-200000.ASM
Responsible Engineer: Y.JASKI/F.WESTFERRO
Drafted: J. DOWNEY
WBS Description: U.1.5.2.2.5
Title 1: INFRASTRUCTURE & ENABLING TECHNOLOGIES
Title 2: FRONT END UPGRADES / FRONT END FOR HHLFE
Title 3: COLLIMATORS-HHLFE
Title 4: -
Title 5: TUNGSTEN EXIT COLLIMATOR

Drawing Revisions

| State | Version | Iteration | Date Last Modified | ICMS URL |
|----------|---------|-----------|-------------------------|----------|
| RELEASED | 00 | 2 | 2012-06-20 08:51:36 CDT | |
| WIP | 00 | 1 | 2012-05-30 16:34:09 CDT | |
| WIP | 00 | 0 | 2012-05-10 09:31:23 CDT | |

Add Drawing to Catalog

6-ID FRONT END 410201-111050-00 6-ID FRONT END Frontend Component Mechanical/Beamlines FRONT END

Features ...

■ Integration with FRIB's Traveler Application

Traveler CDB **Forms** Travelers Binders Documents Ned D. Arnold

FRIB Traveler v3.0

A Web application to design, carry out and organize processes

You might find the previous version document at [github](#) is still helpful before I have all the sections finished in this document.

How to use this document

There is an Audience statement on the top of each section. If you see not the target audience, then you can skip the section.

Basics of the traveler application

Audience: all users

The traveler application is a Web application for design, carry out, and organize electrical process documents, which we call **travelers**. It provides a Web interface for edit and manage **forms**. Furthermore, users can organize travelers by **binder**. The application provides a limited HTTP **API** to read the traveler information.

| |
|---------------------------|
| Basics |
| Travelers |
| Forms |
| Binders |
| API |
| FAQ |
| Contact |

What is a traveler?

A traveler is an electrical document that is designed to support the execution of a predefined process and to collect user input data and notes in the process. A typical traveler user case is to implement a work instruction that specifies all the steps to accomplish a work.

A traveler has properties like title, description, deadline, locations, and tags. The user can add/remove a tag into the tag list. The tag can be a device name defined in CCDB or any string. A traveler is **initialized** when it is created. Its state can be changed to **active**, **submitted for completion**, **completed**, and **frozen**. A traveler can be archived. Only the traveler owner can access the traveler when it is archived. A traveler owner can **share** her/his traveler with other users/groups. A user can also **transfer** the ownership of a traveler to other user.

The process and inside user inputs are defined in a **form**. The users with written permission can input values into an active traveler. The input history is kept in the traveler, and shown under each input. Each input can also have user notes attached to it. A traveler can be considered as the composition of a form, the input data, and the notes.

traveler = form + data + notes

The **travelers** section provides more detailed information about how to use and manage travelers.

Features ...

Integration with FRIB's eTraveler Application



Component Database Portal

Username: Not Logged In
Role: User
View: Default
Project: All

Browse Catalog Inventory

Search Login About

Catalog

(each unique *type of component or component design or COTS item* + properties/drawings/specification/..)



Inventory

(each unique *instance of component* procured or fabricated) + properties/serial #/QR code/travelers/pictures/...)



Machine Designs

Coming Soon ...

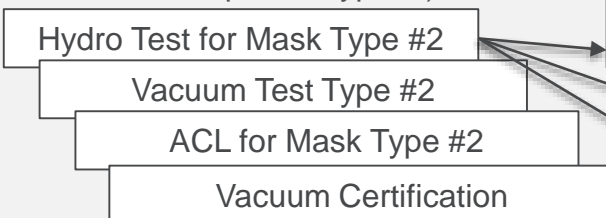
(A group of catalog components to perform a particular function + inventory items to build it + Properties/pictures/locations/...)



eTraveler

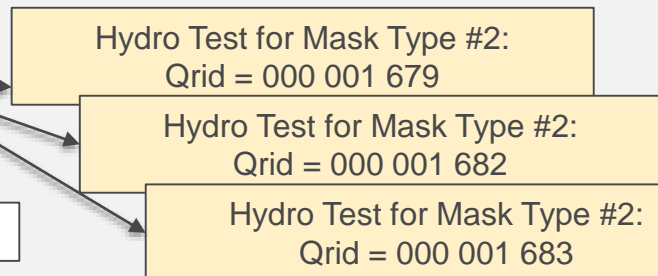
Templates/Forms

(an electronic form designed to guide the user through a set of steps <for specific component types>)



eTraveler [Instances]

(A copy of a Traveler Template filled in for **a particular instance** of a part)



eTraveler Example

Features ...

■ Integration with FRIB's Traveler Application

Argonne
Component Database Portal

Search Administrative Settings Logout About

Catalog Item Details

Name: BELLOWS ASSEMBLY
Model Number: 4102040113-101000-00
Alternate Name: -
Project: APS-U
Description: EXPERIMENTAL FACILITY CONCEPT STUDY END, BELLOWS/SPOOLPIECES, BELLOWS ASSEMBLY
Technical System: Front Ends
Function: Bellows

Properties

| Type | Value | Description | Tag | Actions |
|------------------|-------------------|-------------|-----------|---------|
| PDM File Drawing | 4102040113-101000 | | Model 201 | |
| Image | X.1.4 | | | |

Traveler Templates

| Title | Created By | Created On | Updated By | Updated On | Actions |
|---|------------|--------------------------|------------|--------------------------|---------|
| Bellows 4102040113-101000 Inspection Sheet and Traveler | andarn | 2010-01-30T20:43:07-0500 | andarn | 2010-05-07T16:40:58-0400 | |
| AES MOM Vacuum Leak Check | jenrbk | 2010-01-30T20:43:07-0500 | | | |
| AES MOM Vacuum Bake Out | jenrbk | 2010-01-30T20:43:07-0500 | | | |

Inventory

| More Info | Primary Image | Tag C | QRef C | Serial Num |
|--------------------------|--------------------------|-------------------------|-------------|------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_1 | 000 001 125 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_2 | 000 001 126 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_3 | 000 001 127 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_4 | 000 001 128 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_5 | 000 001 129 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_6 | 000 001 130 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_7 | 000 001 131 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_8 | 000 001 132 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_9 | 000 001 133 | |
| <input type="checkbox"/> | <input type="checkbox"/> | Unit_10 | 000 001 134 | |

Catalog Items have "Templates (Forms)"

Bellows 4102040113-101000 Inspection Sheet and Traveler

Acceptance Criteria

1. Check for component damage

Comments

2. Upload Vendor QA Certifications

Critical Dimensions

Features ...

■ Integration with FRIB's Traveler Application

The screenshot displays the 'Component Database Portal' for 'Bellews Assembly - [Unit: 1]'. The interface includes a navigation bar with 'Browse', 'Catalog', and 'Inventory' tabs. A search bar and utility links like 'Administrative', 'Settings', 'Logout', and 'About' are present. The main content area is divided into several sections:

- Properties:** Shows 'Purchase Description' as 'F7-233041'.
- *Traveler Instances:** A table listing instances with columns for Title, Description, Created By, Updated By, Created From Template, Estimated Quantity, and Action. One instance is highlighted with a red circle, showing an estimated quantity of '6.013.0'. A red circle also highlights the text 'Inventory Items have "Instances"' overlaid on the table.
- Assembly Listing:** Lists related items like 'AES MOM Vacuum Leak Check'.
- Item Membership:** Shows relationships between items.
- Catalog Item Properties:** A table with columns for Type and Value, listing 'POMLink Drawing' (value: 4102040113-101000), 'WBS-DOC' (value: X.1.4.1.2.4.1.13), and 'Image'.

This screenshot shows the 'Traveler' application interface for the 'Bellews 4102040113-101000 Inspection Sheet and Traveler'. It features a title bar, status information, and a list of 'Acceptance Criteria' with associated actions like 'Check for component damage', 'Accept', and 'Reject'. A red circle highlights the 'Tags' field, which contains 'Bellews Assembly [Unit: 1] (QPRC: 113B)'. Below the acceptance criteria, there is a section for 'Critical Dimensions' which includes a technical drawing of a component.

Features ...

■ Integration with FRIB's Traveler Application

- Supports “binders” (groups of eTravelers)
- Traveler specific columns with info fetched from traveler system

eTraveler Instances

+ Add + Create Binder

Binder in CDB

| Title | Description | Created By | Updated By | Created From Template | Estimated Progress | Action |
|---|-------------|------------|------------|---------------------------------|--------------------|--------|
| Incoming Inspection for EVG-230 | | cdb | | Incoming Inspection for EVG-230 | 0.0/1.0 | ⓘ |
| Traveler #APSU_1441055 | | cdb | | Traveler #APSU_1441055 | 0.0/22.0 | ⓘ |
| APSU QA Test | | cdb | | APSU QA Test | 0.0/13.0 | ⓘ |
| Incoming Inspections | | cdb | cdb | N/A - Binder | 0.0/30.0 | |

Binder Contents

| Title | Description | Created By | Updated By | Created From Template | Estimated Progress | Action |
|---------------------------------------|-------------|------------|------------|-----------------------|--------------------|--------|
| Traveler #APS_1694871 | | cdb | | Traveler #APS_1694871 | 0.0/17.0 | ⓘ |
| My modified form | | cdb | | My modified form | 0.0/3.0 | ⓘ |
| My new template | | cdb | | My new template | 0.0/4.0 | ⓘ |

Features ...

■ Coming Soon ...

■ Machine Design Domain

- User interface will be very tricky ... would like it to be graphical
- Capture an exhaustive Bill of Materials for the entire accelerator???

The screenshot shows the Argonne National Laboratory Component DB - DEV web interface. The 'Machine Design' menu item is circled in red. Below the navigation bar is the 'Machine Design Item List' table, which lists various components and their element names. At the bottom of the table is a schematic diagram of an accelerator section with 'Beam Direction' indicated. To the right of the table is a photograph of two racks of electronic equipment, labeled '01-01' and '01-02'.

| Name | Element Name |
|---------------------------------------|---------------|
| - APS | N/A Top Level |
| + MBA Accelerator - SR Mezzanine | E2 |
| + MBA Accelerator - SR Tunnel | E3 |
| - MBA Accelerator: Typical Sector S01 | S01 |
| - FODO | E1 |
| Gate Valve | SxxA:GV2 |
| M3 Design | SxxA:M3 |
| BPM Assembly - Type 1 | SxxA:P5 |
| BPM Assembly - Type 1 | SxxA:P6 |
| Q7 Design | SxxA:Q7 |
| Q8 Design | SxxA:Q8 |
| Vacuum Chamber - Type 12 | SxxA:VC12 |
| Vacuum Chamber - Type 13 | SxxA:VC13 |
| Vacuum Chamber - Type 14 | SxxA:VC14 |
| Vacuum Chamber - Type 15 | SxxA:VC15 |
| Gate Valve | SxxB:GV2 |
| M3 Design | SxxB:M3 |
| BPM Assembly | |
| BPM Assembly | |
| Q4 Design | |

Upstream Doublet / L-Bend / Multiplet (DLM) Module

Beam Direction

Downstream Doublet / L-Bend / Multiplet (DLM) Module

Features ...

■ Coming Soon ...

- MAARC – Measurement and Analysis Archive
 - User Interface to “Data Management” entries

The screenshot displays the Argonne National Laboratory Component DB - DEV interface. The top navigation bar includes 'Browse', 'Catalog', 'Inventory', 'Machine Design', and 'MAARC' (highlighted with a red circle). The 'MAARC Item List' is shown with a table of items. A 'Property Value Metadata' table is also visible, listing various keys and values for a specific item. An inset window shows a plot of magnetic field (T) versus scan position (m).

Argonne
NATIONAL LABORATORY

Component DB - DEV

Username: Not Logged In
Role: User
View: Default
Project: All

Browse - Catalog Inventory Machine Design MAARC

MAARC Item List

- Data uploaded via Data Management scripts
- Captures user-defined meta-data for each item
- Items can be associated with any other CDB item
- First use will be Magnet Measurement data

| Primary Image | Item Name |
|---------------|---|
| | APSU Q1 100011045 |
| | APSU Q1 100011045 Excitation_r0001_s001_f1_procFld_p1.log |
| | APSU Q1 100011045 Excitation_r0001_s001_rawFld_f1.log |
| | APSU Q1 100011045 Excitation_r001.ecf |
| | APSU Q1 100011045 Excitation_r001_s001_f1_procFld_p1.sdds |
| | APSU Q1 100011045 Excitation_r001_s001_raw.sdds |
| | APSU Q1 100011045 Excitation_r001_s001_rawFld_f1.sdds |
| | APSU Q1 100011045 Excitation_r001_s001_tProfile.sdds |
| | APSU Q1 100011045 notes1.doc |
| | APSU Q1 100011045_scan_20180215_1501.pdf |
| | APSU Q1 100011045_scan_20180215_1502.pdf |
| | APSU Q1 100011045_scan_20180215_1503.pdf |
| | APSU Q1 Excitation_20180215_1501.scr |
| | APSU Q1 Excitation_AvgCentering_001.swc |
| | Coil_c001_20180215_1501.cdf |
| | Coil_c001_s001.cdf |
| | Coil_c001_s001_a001.cdf |

| Key | Value |
|---------------------------|--|
| dataDirectory | /net/hellos/cslsdaq1/dm/vast/APSU_Q1_10001 |
| experimentFilePath | plot/APSU_Q1_100011045_scan_20180215 |
| experimentName | APSU_Q1_100011045 |
| fileCreationTime | 1518708103 |
| fileCreationTimestamp | 2018/02/15 09:38:23 CST |
| fileLocations | extrepid://apsdata.aps.anl.gov/gdata/dm/APSU |
| fileModificationTime | 1518707439 |
| fileModificationTimestamp | 2018/02/15 09:10:39 CST |
| fileName | APSU_Q1_100011045_scan_20180215_1501 |
| fileProcessingTime | 1518730561.15514 |
| fileProcessingTimestamp | 2018/02/15 15:36:01 CST |
| fileSize | 24884 |
| md5Sum | b9542871da8d96723434da607cf49614 |
| uploadId | 59e2c550-2c9f-491d-993f-326c27c3cbcd |

2015/05/28/helProbeScan-M1Preto-000000072-0006-000061

magnetic field (T)

scan position (m)

xPosition = 2.301300e-02

Features ...

■ Coming Soon ...

■ Mobile Apps

Computer/ Tablet/ Phone

...can run the CDB application in any browser



Mobile Computer

...with wifi and scanner that runs custom applications (e.g. APS Stockroom)



Handheld Scanners

(bluetooth to tablet with custom tablet application)



- Takes photos
- Scans docs to pdf



APS-U / CDB
000 000 639

<URLs encoded in the symbol which directs browser to the CDB page for that QrId >
<http://qr.aps.anl.gov/cdb/componentInstance/view?qrId=639>



<These tags require a CDB-aware application that knows what to do with the number (encoding a URL would be too long)>

APSU 123 456 910

<OCRfont>

Technologies

- CDB

- MySQL (DB)
- Java / Glassfish (Web Portal)
- PrimeFaces (UI framework)
- CherryPy (Web services)

- Future Needs ...

- Generate reports from data in eTravelers
 - e.g. “Display the width measurement for each bellows received”
- Item Relationships (like IRMIS 2.0, circa 2005)
- Cable Management
- Directory Service / Name Database

0 → CDB in 4:59 (our aspiration)

■ Install ... (djarosz@anl.gov)

■ **Prerequisites command for red-hat is:**

- yum install -y gcc libgcc expect zlib-devel openssl-devel openldap-devel readline-devel git make cmake sed gawk autoconf automake wget mysql mysql-libs mysql-server mysql-devel curl

■ **Prerequisites command for debian is:**

- apt-get install wget gcc git make cmake build-essential libcurses-ocaml-dev curl expect mysql-server libmysqlclient-dev openssl libssl-dev libldap2-dev libsasl2-dev sed gawk

■ **Deployment Process:**

- --- Create a directory for installation and cd into it
- mkdir install
- cd install
- --- Get the repository from github [<https://github.com/AdvancedPhotonSource/ComponentDB>]
- --- NOTE: we also have releases on the page for more stable code)
- git clone https://github.com/AdvancedPhotonSource/ComponentDB.git
- cd ComponentDB
- --- Get additional support installed within the cdb install directory
- make support
- source setup.sh #load env with new support
- --- Follow on screen instructions to generate required configurations for the application
- make configuration
- --- Add necessary data to mysql database
- make clean-db
- --- Apply configuration and configure connections to db for glassfish
- make configure-web-portal
- --- finally deploy the portal
- make deploy-web-portal