DUNE PartsID numbering scheme
for
HVS consortium

DUNE PartsID:

- It is a uniquely defined ID.

- You must assign a PartsID to every entry to the Hardware DB (HWDB).

Hajime Muramatsu

HWDB

- An official place to store the all important parts related information.

  ▸ E.g., when something happens to a part of the detector, you might want to be able to tell which parts/fabrications are responsible within the location of the detector.

  ▸ E.g., you certainly do not want to record evert bolt/nut…

  ▸ YOU decide what needs to be stored so that they might be useful in the future.

- Its production version is up and running @

  https://dbweb0.fnal.gov/cdb/login/ldap

  We have not entered a thing to it, yet.

- Its development version is up and running @

  https://rexdbsrv4.fnal.gov:9443/cdbdev/login/

  We have been testing our app against this DB.

  You have to have the FNAL VPN to access to this DB.

ID scheme

- **For more details, see its documentation by Marco Verzocchi**

  https://edms.cern.ch/document/2505353

- **It's a string, consisting of 29 alphanumerics with**

  7 fixed and 3 mutable columns.

D/I/L/P	01-99	001-999	0001-FFFF	-	0001-FFFF	-	AA-ZZ	001-999	-	00-99	00-99	001-999
Project	System ID	Subsystem ID	Item Type ID	Dash	Item Number	Dash	Country of Origin	Responsible Institution ID	Dash	Detector ID	Final Destination	Intermediate Destination
F	F	F	F		F		F	F		M	M	M

- **Project :**
  D : DUNE, including approved FD modules and NDs.
  I : Integration
  L : LBNF, including cryostats, cryogenic plants, cavern services…etc.
  P : Future project
  So this column is pretty much fixed. For us, it is always "D".

The latest scheme...

From last week DB meeting (Jim Stewart)

D/I/L/P	001-999	001-999	0001-FFFF	-	0001-FFFF	-	AA-ZZ	001-999	-	00-99	00-99	001-999
Project	System ID	Subsystem ID	Item Type ID	Dash	Item Number	Dash	Country of Origin	Responsible Institution ID	Dash	Detector ID	Final Destination	Intermediate Destination
F	F	F	F		F		F	F		M	M	M

From Marco's original document

D/I/L/P	01-99	001-999	0001-FFFF	-	0001-FFFF	-	AA-ZZ	001-999	-	00-99	00-99	001-999
Project	System ID	Subsystem ID	Item Type ID	Dash	Item Number	Dash	Country of Origin	Responsible Institution ID	Dash	Detector ID	Final Destination	Intermediate Destination
F	F	F	F		F		F	F		M	M	M

- **The first 7 non-mutable fields make up the unique ID in HWDB.**
- **Jim is suggesting to increase one more digit in System ID. This will likely happen.**

Wait, what is System ID and how is it used?

System ID

System ID	Description
000	Invalid
001	FD1-HD Complete Detector
002	FD1-HD Instrumented Anode Plane (with Elec and photon Det.)
003	FD1-HD Anode Plane Assemblies (bare wire planes)
004	FD1-HD Photon Detection System
005	FD1-HD Calibration
051	FD2-VD Complete Detector
052	FD2-VD Instrumented Top Charge Readout Planes (CRP) (inc. Elect)
053	FD2-VD Instrumented Bottom Charge Readout Planes (CRP) (inc. Elect)
054	FD2-VD Instrumented Cathode Plane (inc. PD)
055	FD2-VD Top Charge Readout Planes (CRP)
056	FD2-VD Bottom Charge Readout Planes (CRP)
057	FD2-VD Top Vertical Drift CRP Electronics
058	FD2-VD Photon Detector
059	FD2-VD Calibration
080	FD HV
081	FD1-HD TPC Elec. and FD2-VD Bottom Elec.
082	FD DAQ
083	FD Slow Control
084	FD Cryogenic Instrumentation
085	FD Integration
086	FD Installation
100	ND: Near detector complex
101	ND: Liquid Argon Near Detector
102	ND: TMS
103	ND: Beam Monitor – SAND
104	ND: DAQ
105	ND: Slow Controls
106	ND: Prism Infrastructure
107	ND: Integration
108	ND: Installation
200	FS: Safety
201	FS: BSI
220	NS: Safety
221	NS: BSI
300	FS: Cryogenics
321	NS: Cryogenics
400	FS: Networking
421	NS: Networking
500	Computing
600	FD Cryostat
621	ND Cryostat
900	ProtoDUNE-II complete detector
901	FD2-VD Module-0 complete detector

From Marco's original document

System ID	Consortium	Reference
	Far Detector	
01	Anode Plane Assemblies	Put link to EDMS document here
02	Photon Detection System	
03	TPC Electronics	
04	Charge Readout Planes	
05	Top Vertical Drift TPC Electronics	
06	High Voltage System	
07	Calibration and Cryogenic Instrumentation	
	Near Detector	
11	Liquid Argon Detector	
12	Beam Monitor - SAND	
	Joint FD/ND Consortia	
21	DAQ and Slow Controls	
22	Computing	

- We have 080 for HD HV.
- Q1: Do you need different SystemIDs for FD1-HD HVS and FD2-VD HVS? Or just one SystemID would be sufficient?
- For rest of this talk, I just assume System ID = 006 = FD1 HD HVS

PartsID for HVS

D/I/L/P	001-999	001-999	0001-FFFF	-	0001-FFFF	-	AA-ZZ	001-999	-	00-99	00-99	001-999
Project	System ID	Subsystem ID	Item Type ID	Dash	Item Number	Dash	Country of Origin	Responsible Institution ID	Dash	Detector ID	Final Destination	Intermediate Destination
F	F	F	F		F		F	F		M	M	M

What have been already fixed so far are:
- **Project : D (=DUNE)**
- **System ID : 006 (FD1-HD HVS)**

For rest of this talk, I assume:
- **Country : US (for country code, see Marco's doc for more detail)**
- **Institution : 125 (= ANL, for institutional code, see Marco's doc for more detail)**

So, we are left to utilize;
- **Subsystem ID (001-999)**
- **Item Type (0001-FFFF; FFFF = 65535 in dec)**
- **Item Number (0001-FFFF)**
for the entire HVS.

A suggestion for
Subsystem ID-ing for HVS

- **Have 4 ranges for 4 groups;**
  CPA, Field Cage, End Wall, and Power-Supplies and their cables.

- **001-299 for CPA**

  300-599 for FC
  600-899 for EW
  900-999 for PS and cables

- **NO Allocation for future use in the above suggestion.**

- **Q2: would be great if the HVS consortium could finalize the assignment for SubsystemID soon.**
  (do you have enough #s allocated for your needs?)

CPA as an example - 1

- **For CPA, we have allocate SubsystemID = 001-099 for Raw Parts. E.g.,;**
  ‣ **Subsystem ID : 001 = FR4 frames.**
    ➡ **Item Type ID = 0001 = Main support bar**
    ➡ **Item Type ID = 0002 = Upper-side bar…etc.**
  ‣ **Subsystem ID : 002 = FSS**
  ‣ **Subsystem ID : 003 = RP … etc**

> **E.g.,**
> - **Project : D (DUNE)**
> - **System ID : 006 (FD1-HD HVS)**
> - **Subsystem ID : 001 (= FR4 frames)**
> - **ItemType ID : 0001 (= main support bar)**
> - **Item Number : 0001**
> - **Country : US**
> - **Institution : 125 (= ANL)**
>   **Or D0060010001-0001-US-125**

- **Rather straightforward to assign for raw parts.**
  We allocate 100-199 Composite Objects:
    - **100 = Unit**
    - **101 = Panel**
    - **102 = Plane**
    - **103 = CPA/FC Assembly**
    - **104 = Array**
    - **105 = CPA/FC/EW Assembly**
  200-299 Allocated for future use

CPA as an example - 2

- **E.g., for a CPA Panel**
  - ▸ **Subsystem ID : 101 = a Panel.**
    - ➡ **Item Type ID = 0001 = Panel Type**
    - ➡ **Item Type ID = 0002 = another Panel Type**

E.g.,
- **Project : D (DUNE)**
- **System ID : 006 (FD1-HD HVS)**
- **Subsystem ID : 101 (= Panel)**
- **ItemType ID : 0001 (= Panel Type)**
- **Item Number : 0001 (Panel ID)**
- **Country : US**
- **Institution : 125 (= ANL)**
  - **Or D0061010001-0001-US-125**

- **We QC-check on this Panel and insert the result to the HWDB**

CPA as an example - 3

on the HWDB side

Components DB

Edit Component D066000001-000A-US-125-2108191031

| SPECS LOG | STRUCTURE LOG | CONTAINER LOG | TEST LOG | IMAGES |

External ID: D066000001-000A-US-125-2108191031
Serial Number:
Manufacturer: Hajime Inc
Batch ID: 1237
Created: 2021-08-19 10:31:58
Created by: Hajime Muramatsu
Contained in: N/A
Component Type: CPA_Panels
Pack it in...:

Specifications

Unit 1	D06500YYYY-XXXX-US-125
Unit 2	D06500YYYY-XXXX-US-125
Unit 3	D06500YYYY-XXXX-US-125
Unit 4	D06500YYYY-XXXX-US-125
Unit 5	D06500YYYY-XXXX-US-125
Unit 6	D06500YYYY-XXXX-US-125
Parts ID	D066000001-000A-US-125-2108191031
Panel Type	G

SAVE DONE

Packing List

FILTER...

Home
Batches
Cable Structures
Component Types
Components
Geographic Locations
Images
Manufacturers
Purchase Orders
Structures
Admin
Logout

QC test results of this Panel are stored there.

The temporary DUNE PartsID (= a Panel ID)
Its scheme is different from what I'm showing in this talk (shown here is one of our tests)

The corresponding 6 Unit IDs, from which we can extract info on each of the corresponding Units.

- **Q3: would be great if these DB schema are defined soon.**
(need to decide what to store..)

PartsID Database

- It's yet another DB (though this might be part of the HWDB functionalities)
- It;

    ▸ generates a unique DUNE PartsID per request

    ▸ stores the all generated IDs (obviously to keep track IDs)

    ▸ needs to have the all DB schema from all consortia (and so does HWDB)

- It's in development, will start to run soon (DB group).

- While it is not clear the final procedure to enter info to HWDB,
  our QC app will likely have to talk to this ID-DB first, get an ID, and use it to
  enter things to HWD.

Summary/Questions/Requests

- Q1: Do you need different SystemIDs for FD1-HD HVS and FD2-VD HVS?

  Or just one SystemID would be sufficient?
- Q2: would be great if the HVS consortium could finalize the assignment for SubsystemID soon.

  (do you have enough #s allocated for your needs?)
- Q3: would be great if DB schema are defined soon (i.e., need to decide what to store in HWDB).

- Whom should you talk to about all of these?
  - ▸ Steve Magill is the liaison for the HVS consortium to communicate with the DB group.
  - ▸ Steve and I communicate with Jim (Installation) and Paul/Norm (DB).