Hardware DB requirements and status

Norm Buchanan (CSU) and Paul Laycock (BNL)

BROOKHAVEN NATIONAL LABORATORY

COLORADO STATE UNIVERSITY

U.S. DEPARTMENT OF ENERGY

Database Group
Mandate from the DUNE Management document

The DUNE experiment will require a number of databases related to the construction, calibration and operations of the detectors. The formation of a specific group is intended to avoid the proliferation of *ad hoc* solutions across the collaboration. Centralizing these activities is intended to provide a route to long- term maintainability. The database group will be responsible for:

- Coordinating requests from the collaboration for database resources.

- Managing the specifications relating to these databases (i.e. scalability or accessibility) and for ensuring that provided solutions meet these specifications.

- Providing the experiment with the interfaces and/or tools to populate the databases and for any associated documentation or monitoring that is needed for their operation.

- Updating, as needed, the database infrastructure or designs to meet the needs of the experiment. The collaboration as a whole will be encouraged to engage in these activities.

Consortia Database Liaisons

Interfaces with Hardware Consortia

Each of the hardware consortia will name a liaison to provide communication between the particular consortium and the database group.

- SP APA (Nathaniel Tagg) (ntagg@otterbein.edu)
- SP Photon Detector System (Dave Warner)
- SP TPC Electronics (Marco Verzocchi)
- DP Photon Detector System (Burak Bilki)
- DP TPC Electronics (Elisabetta Pennacchio)
- DAQ (Roland Sipos)
- HV (Steve Magill)
- Calibration Hardware (Nuno Barros)
- DUNE QA Specialist (James Mateyack)

https://wiki.dunescience.org/wiki/Hardware_Database

- Identify a database group liaison for each consortium
  - Not the technical lead, except in the case of Marco
- Work from there to define requirements
  - Difficult to converge, very little funded effort on DB group side and not a priority for many consortia
  - A distilled version was used to obtain funding for a service at FNAL - some urgency for SP APA

Hardware DB requirements

- Distilled version of the requirements
  - We need the ability to define arbitrary components with arbitrary attributes.
  - We need to make arbitrary composites (structures) of said components.
  - We need to record related test data and other metadata and associate this with components and structures.
  - We need to track the evolution in time of all of the above.

- Longer version is being written up, one key requirement is that given the need to incorporate all consortia hardware into this schema, we need the ability to uniquely reference components and structures
  - Overlap with the work being done on PBS was self-evident
    - Generating a QR code from a uniqueID is also a popular idea
  - Assume we do not want to have two unique ways to refer to components

Hardware DB status

- Documentation: https://cdcvs.fnal.gov/redmine/projects/components-db/wiki

- Hardware DB is running in development
  - GUI-driven by design
- All DUNE members in Ferry can login to read data, DB coordination can assign write access
  - we have discussed the need to have non-members read/write
- Functionality available for testing, more testing desired
  - Thanks in particular to Hajime* for already giving feedback
- REST (access) interface design exists, implementation in progress
  - Interfaces for data entry / retrieval

- *Hajime has an iPad app for recording QC of CPA, including ability to scan QR / barcodes

Hardware DB status

- Documentation: https://cdcvs.fnal.gov/redmine/projects/components-db/wiki
- Left: the REST API overview Right: example QC CPA Ash River trials

Table of contents

Name	#Ordered	#Received	Visual	Template	Cleaned	
Main Support Bar	2	2	2	2		
Upper Side Bar (LH)						
Upper Side Bar (RH)	2	2	2	2		
Intermediate Bar	20	20	20	20		
Side Middle Bar (LH)						
Side Middle Bar (RH)	8	8	8	8		
Lower Side Bar (LH)						
Lower Side Bar (RH)	2	2	2	2		
Bottom Support Bar	2	2	2	2		
Upper Side Bar (LH)	2	2	2	2		
Side Middle Bar (LH)	8	8	8	8		
Lower Side Bar (LH)	2	2	2	2		
Comment:	Possible wrong fiber orientation in A405 Intermediate Bars					

Discussion

- HardwareDB made a lot of progress since the January CB
  - Do we fully understand all of the requirements? Unclear
  - Reasonable comments made that a solution may already exist
    - Do we have all of the requirements? Who would conduct the review? Tiny funded effort in the Database group is for development
    - In-house, while not being as efficient, has the advantage of having access to the developers, and it seems clear requirements will continue to evolve even after we have something in production

- PBS has requirements for the unique identification of components (see Marco's talk)
  - It seems natural to coordinate the solution to a common problem
- SP APA has an advanced QC DB (see Nathaniel's talk)
  - The backend has a lot of overlap with HardwareDB, discussions started in the Database group about how to avoid duplication of effort and inconsistency
- CPA QC app should play well with the HardwareDB backend

- Potential for coordinating the solution, but would require more coordination work now
  - The DB group does not have sufficient effort for this
  - It needs coordination across project stakeholders: per-consortia policies, compliance, data entry…