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 and 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)

We very much rely on our consortia contacts!

- Latest list maintained at https://wiki.dunescience.org/wiki/Hardware_Database
- Database group is convened by Norm Buchanan (CSU) and Paul Laycock (BNL)
- Bi-weekly meetings on **Wednesdays at 14:00 CDT**: https://indico.fnal.gov/category/754/
  - *Open to suggestions for a more European-friendly time*

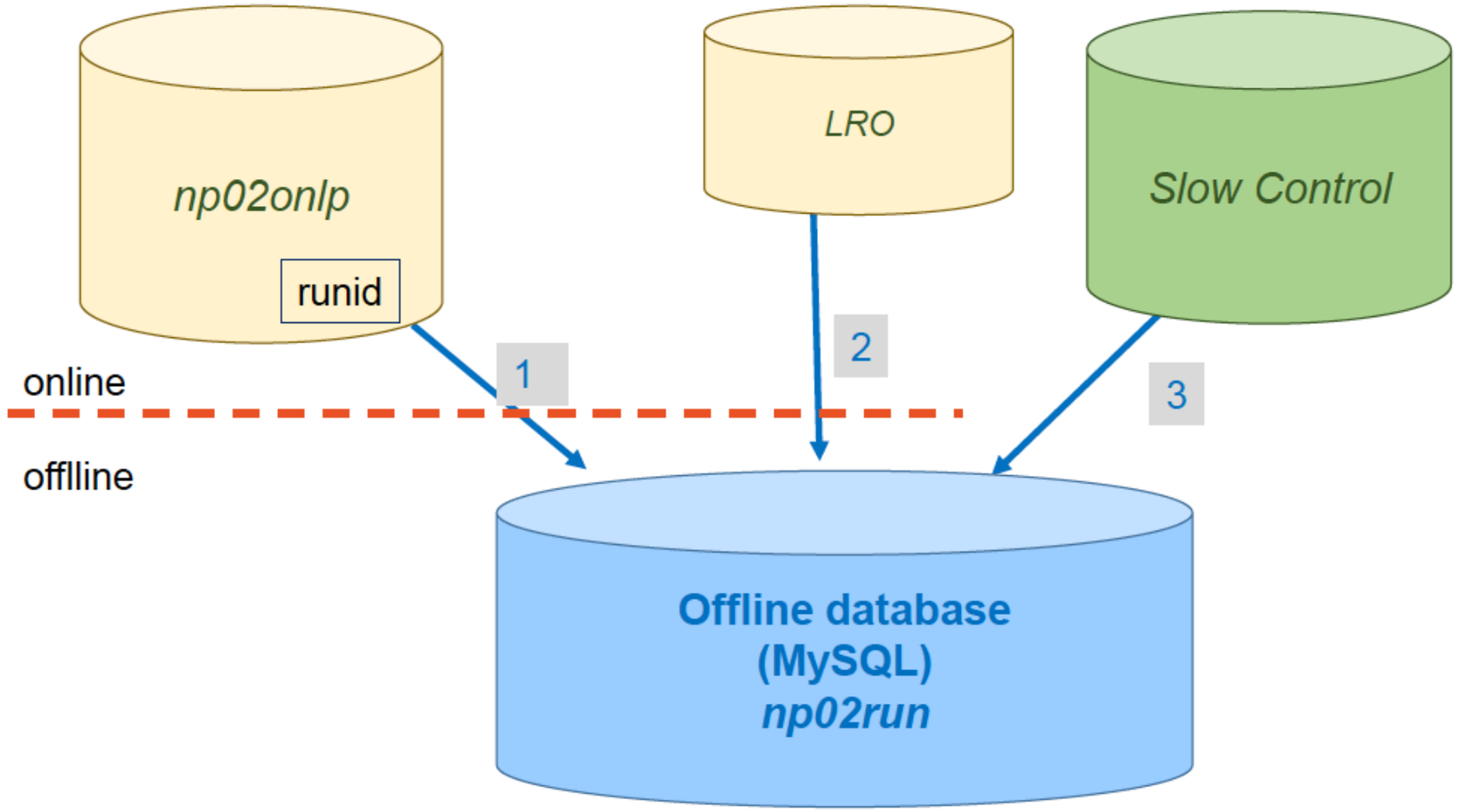
HardwareDB - Requirements

Functional Requirements

1. **Unique ID:**
    a. Every component used in DUNE — either atomic or an aggregation — shall be uniquely identifiable. To make this possible, DUNE shall have a uniform mechanism to generate Unique IDs.
    b. Each subsystem working group shall comply with the protocol for generating and handling these Unique UDs to ensure consistency across databases and systems.
    c. In cases when there is a manufacturer-supplied serial number or a similar ID assigned to a component, such identifier is recorded and queries must be possible which cross-reference the manufacturer-specific ID with the Unique ID.
2. **Aggregations:**
    a. The DUNE Hardware Database will contain functionality allowing creation and dissolution of aggregations as defined in the Glossary.
    b. Aggregations can be hierarchical i.e. contain (refer to) other aggregations.
    c. Database schemas shall not contain hardcoded assumptions about aggregation topologies or content

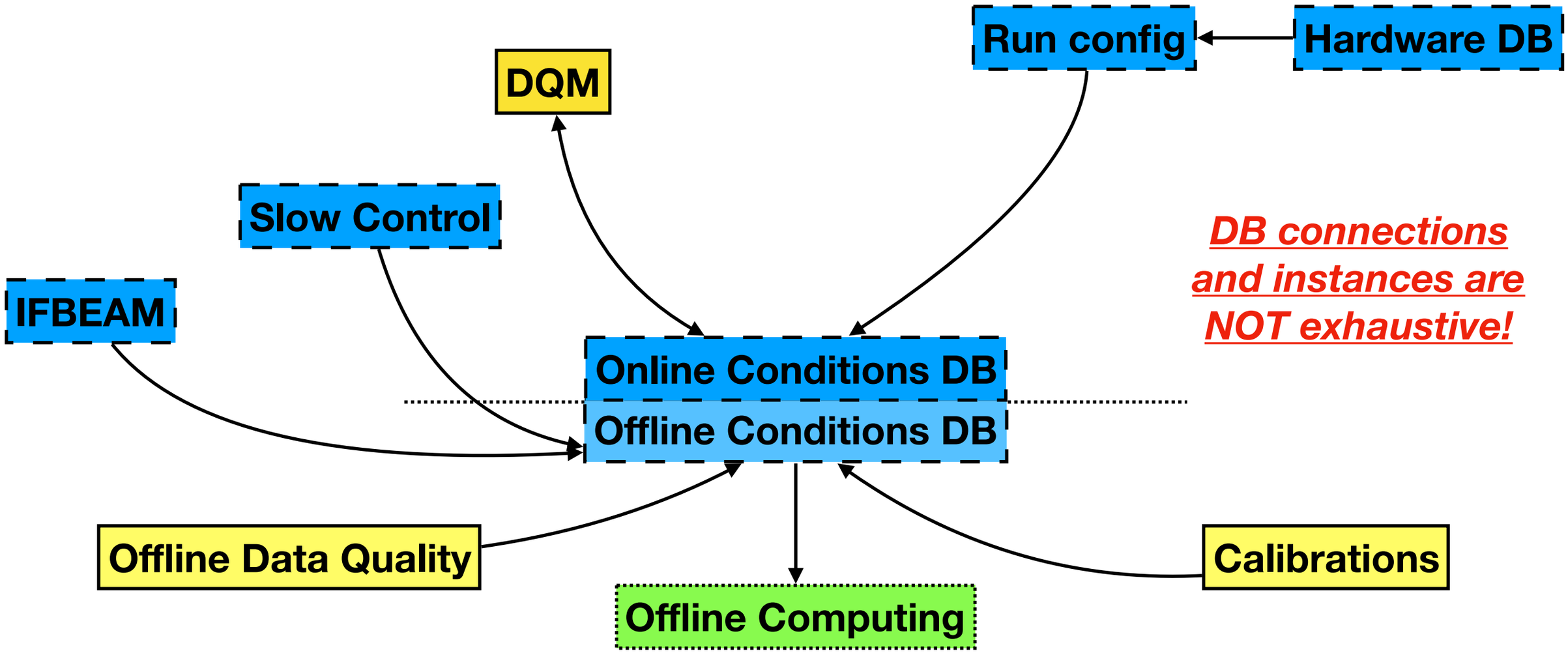
- Work started at the **DUNE DB Workshop in December at CSU**
- Converged on a set of requirements for the HardwareDB, thanks to input from stakeholders https://docs.google.com/document/d/19z1mH-rk56giZrPH6HgkNUbNtQ0IeaNmzQULdAGnEYQ/edit?usp=sharing
- Schema design proposed by **FNAL** team, ***effort identified and funded***

Online-offline integration



- Proposal from ***Elisabetta Pennacchio*** for copying information from slow control and online data processing to an offline database
  - ***Many thanks to Elisabetta for bringing this to the Databases group!***
- Suggestion from ***Igor Mandrichenko*** to modify the DB schema, allowing it to map to the conditions DB service at **FNAL**
  - If we can centralise infrastructure and support effort we will have more sustainable solutions

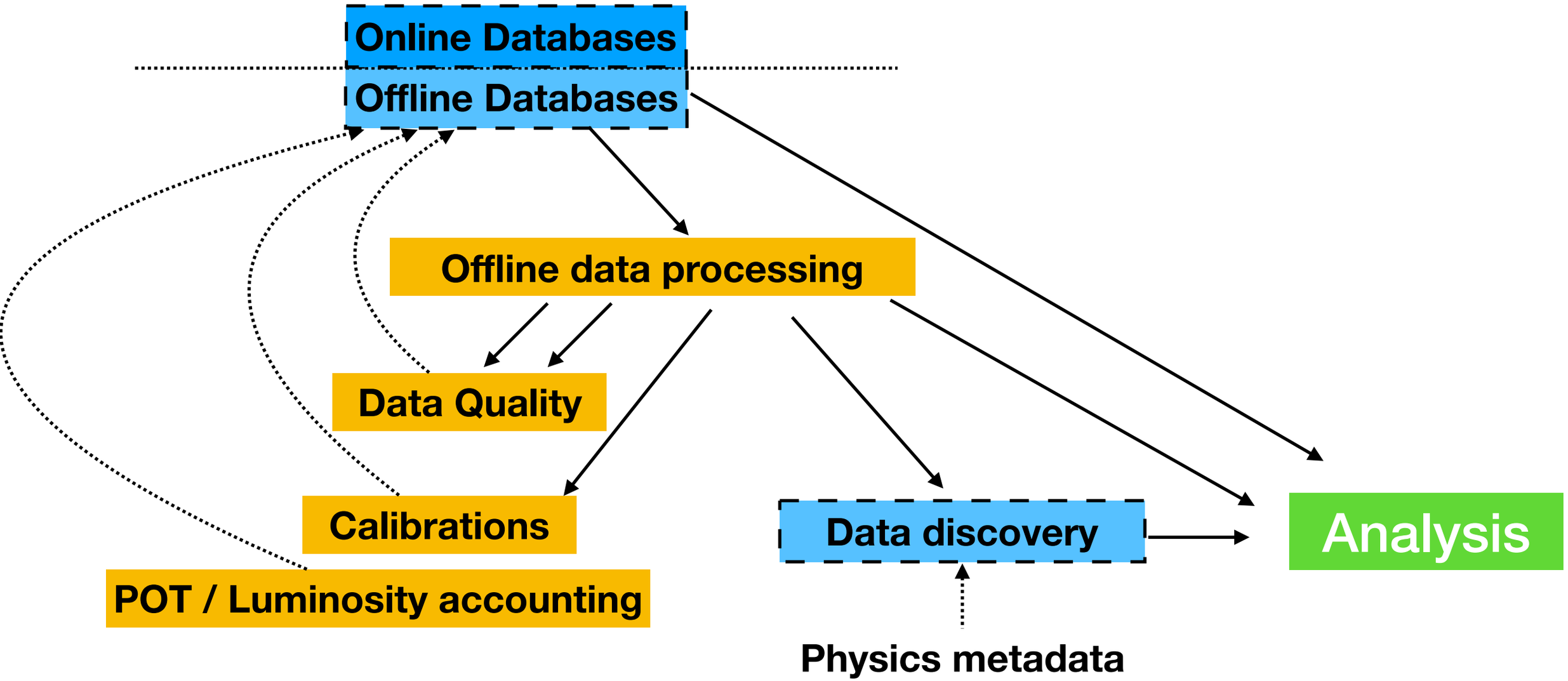
Online-offline integration II



DB connections and instances are NOT exhaustive!

- ***Online metadata producers write directly to online databases***
  - Either dedicated databases where appropriate, or the Conditions DB
  - Some online metadata is needed offline, filtered to the Conditions DB
- ***Offline metadata producers write to the offline Conditions DB***
  - Some offline metadata is needed online, via the Conditions DB

Database interface - offline-centric view



- Preferable to have one coherent ***interface*** to metadata for offline
  - May be supported by several DB backends