

# ProtoDUNE raw data management

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protoDUNE computing interface group meeting

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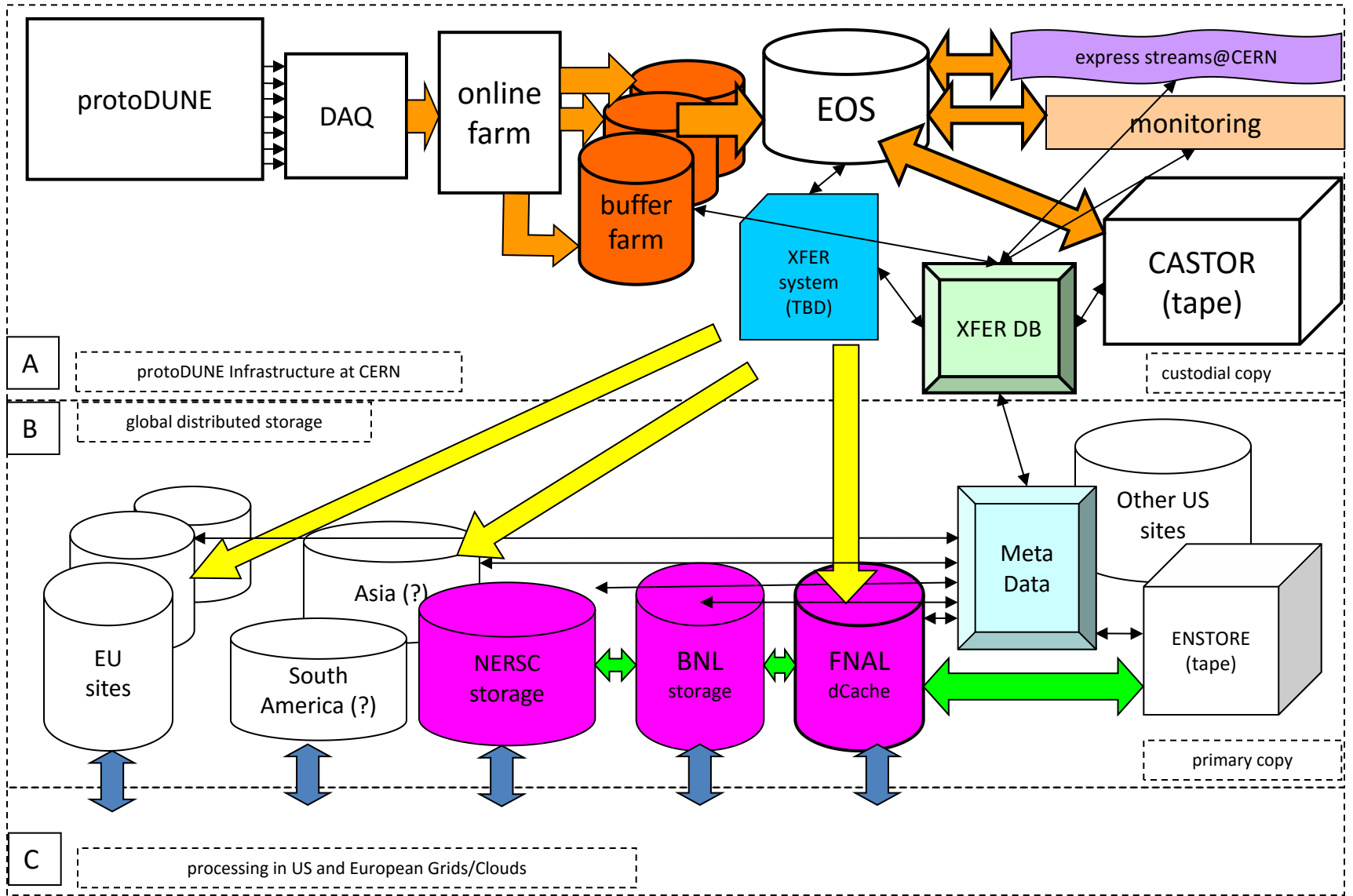
# Outline

- General design and its history
- New developments since the CERN meeting
- Items to be understood and developed in near to medium term

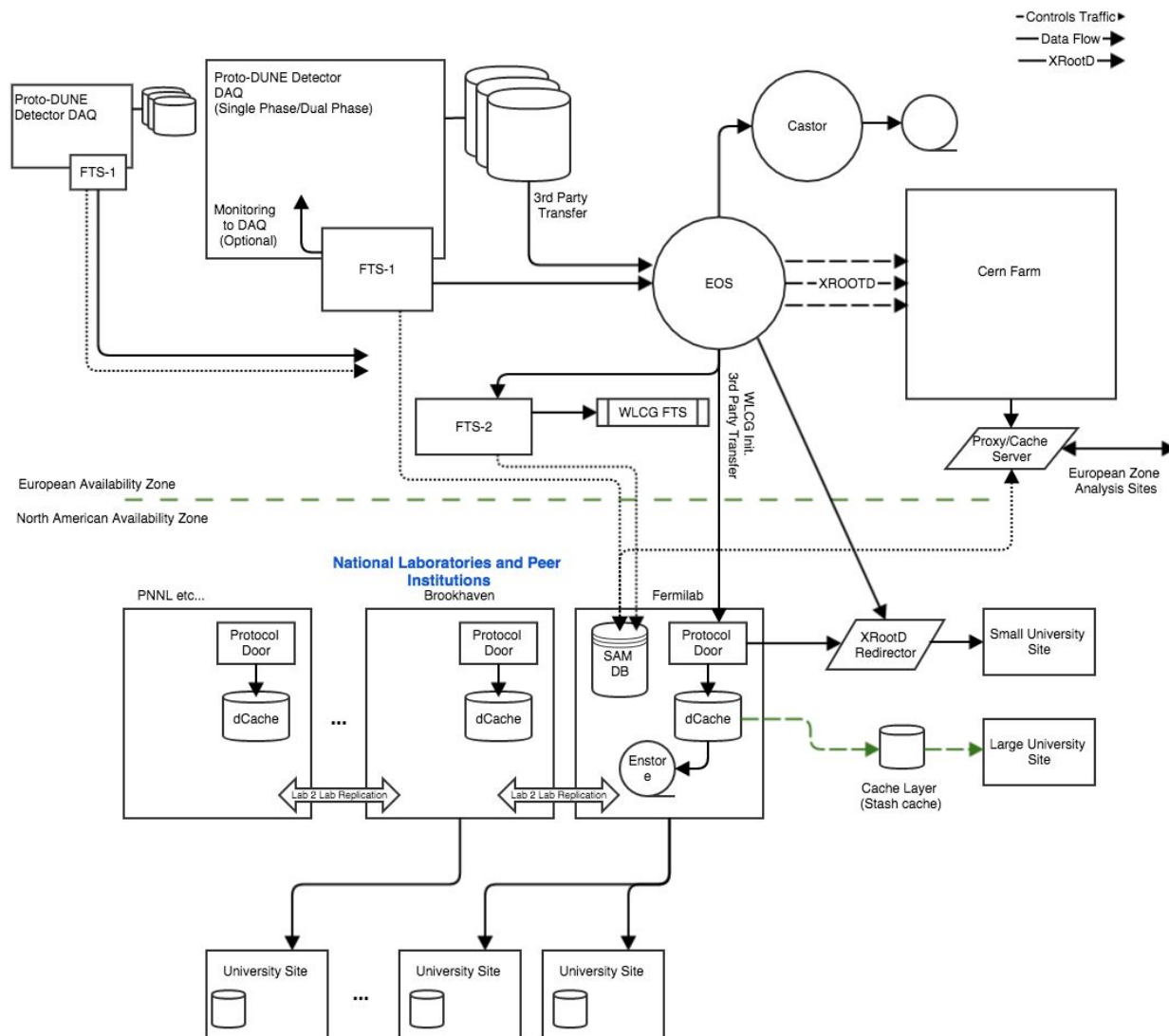
# Brief history

- Conceptual diagram of the raw data flow (next slide) was created a while ago and accepted as a starting point by most people
  - A requirements analysis paper drafted by Brett in early March 2016
  - Official mandate from Mark and Andre to draft the protoDUNE computing model by April 2016
- Real design work started in the past few weeks due to stimulating discussions at CERN (DAQ workshop)
- A one day meeting took place at FNAL on 3/15/2016; a FNAL team takes a major responsibility to develop the data management system; a few slides attached to this agenda item
- In the following week, a design document has been drafted by participants of the meeting (Andrew, Robert, Marc, Oli, Maxim, Brett, others)
- <https://docs.google.com/document/d/1zLleejBRQH3OenrXoVkwJNT6CnN2NoLAEhXDTJ5jHGc/>
- This is the deliverable that reflects our current understanding of the protoDUNE computing model *at this point in time* and contains concrete ideas, estimates and description of tools
  - Integration of this material into the “proper” computing model (which is a section of the more general DUNE document) will occur at a later point
  - It appears that the requirements developed before are satisfied by this design

# Conceptual diagram of the raw data flow. This design is now considered as "standard".



# FTS-based architecture for managing raw data in protoDUNE



# Summary

- The proposed architecture of the FTS-based raw data management system is based on previously developed general pattern and requirements
- Note that there is extensive sharing of architecture, systems and resources between NP02 and NP04 in this design.
- Items to be discussed (not exclusively)
  - does this satisfy specific NP02 requirements? What is the general expected pattern of on-site processing and data delivery from NP02 to central storage?
  - is data replication to sites like Lyon needed/considered/desirable?
  - how final is the NP02 BeeGFS-based design of the online storage solution?
  - while it is expected that FTS can interface BeeGFS as easily as any other file system, this needs to be confirmed from scalability, throughput and other points of view.
  - are we ready to make a decision on sharing the buffer farm between the two prototypes? The default options is to have separate online storage and merge the data streams once the hit EOS. This provides a degree of simplicity and decoupling that makes development easier.
- Initial planning for the development and integration platform started (e.g. using BNL and FNAL as endpoints), there will be more detailed plans in the next few weeks
- Even with this significant contribution from FNAL, we need to be prepared for substantial testing and integration work to put this system in place.

# Misc

- Design just started on the NP04 DAQ/buffer interface
  - the “buffer” is essentially a storage appliance attached to the “online DAQ farm” so it's really a part of it
  - exploring ideas of a xrootd cluster as a lightweight solution satisfying the requirements (bandwidth, redundancy etc)
  - we have ongoing discussions with experts and will form a NP04 proposal soon
  - plans for a testbed at BNL, for R&D on the buffer farm
- Keeping a possibility open for some “in the pit” processing in NP04 (current option is to have minimal or no processing outside of basic monitoring). What's the plan for NP02?
- Should we meet in person in early May to get better understanding before Rapid City?
- Production/Offline Processing: an important item, haven't started work on that yet (no effort available)
- These work areas need to be reflected in our follow-up to the EoI process