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ProtoDUNE, potential FNAL contributions

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ProtoDUNE Computing

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My interpretation of what I heard this week…

- Ready for data taking ~March 2018
  - Infrastructure in place and tested beginning of 2018
- As far as software and computing goes, it is desirable to handle both detectors with the same approach
  - To the extend that the requirements are the same
  - To make life easier, and given the timeline, possible…
- So, common Computing Model, unified operations, possible common software framework
  - Desirable to analyze data from both detectors in the same environment

Data processing workflow

- Copy of data stored at CERN (CASTOR), transfer to Fermilab
  - Data will distributed further, Computing Model (needs to be further detailed) determines additional requirements (buffer disk and tape OK for storing, amount of cache disk depends on actual analysis workflow strategy and number of analysis centers
    - Distributed analysis model will determine needs
    - Really: how do you expect to do analysis; like LHC, i.e. central reconstruction and then analysis by all, or frequent re-reconstruction of RAW data by individual analysts?
  - Assumption is that collaboration will go back to RAW data many times
- Fermilab could provide storage (tape) for copy and appropriate disk caches (for storage system and analysis campaign, based on computing model needs)
  - With an appropriate project or dedicated operations budget line

MC production

- Expected to follow a distributed approach, FNAL could contribute compute resources, store and distribute data

Computing Resources

- For dedicated computing resources (processing) we could could go through Fermilab's resource planning process (we will attempt to secure operations funds and procure resources) or we could host and operate experiment owned resources.
- The same holds for detector data processing

Software Tools

- Fermilab could integrate our toolkit for distributed data management, job submission, etc.
  - will interface with Castor and EOS at CERN
    - Will need joint effort with the collaboration to test that satisfies requirements
  - Toolkit already utilized by Fermilab experiments (including MicroBooNE and planned for SBND)
    - And integrated with LArSoft
  - Because it is used by many support effort will be modest
  - In general, for whichever system it is used, it is desirable to have the same software stack, including software framework for both prototypes
    - To minimize development and support effort

Software tools

- In the context of the LArSoft project and collaboration, we will support LArSoft deployment and specific applications for the experiment(s)
  - Working with the collaboration for requirements, design, and joint development effort
  - Could interface with QSCAN, to encapsulate functionality so the utilization of the facility software stack is done in a unified way
    - Will need effort and QSCAN expertise from the collaboration
- Regarding DAQ/online tools, we could support artdaq utilization and co-develop ProtoDUNE applications with interested partners from the collaboration
  - For different system designs

Software tools and utilities

- Provide support and consulting for Geant4 and Root, coordinating with our CERN colleagues
  - SCD relevant groups work closely (and communicate frequently!) with the SFT group
- Provide support and consulting for utilization of the GENIE generator

Coordination/communication

- Given the compressed time-line, it is desirable that regular meetings with ProtoDUNE coordinator(s), CERN and FNAL (at a minimum) are established as soon as possible