



# Online Computing Overview for protoDUNE Single Phase Test Beam

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# Why are we in this room together?

- CERN IT Consultancy request (RQF0697560)
- NP04/protoDUNE-SP will assume occupancy of EHN1 facilities in a few months. We would like to expand on our current plans for IT at the experiment.
- The goal is to create a complete computing architecture that includes
  - network
  - security
  - DAQ
  - offline data transfer
  - slow controls
  - online monitoring
  - web services
  - databases
  - operations
  - control room

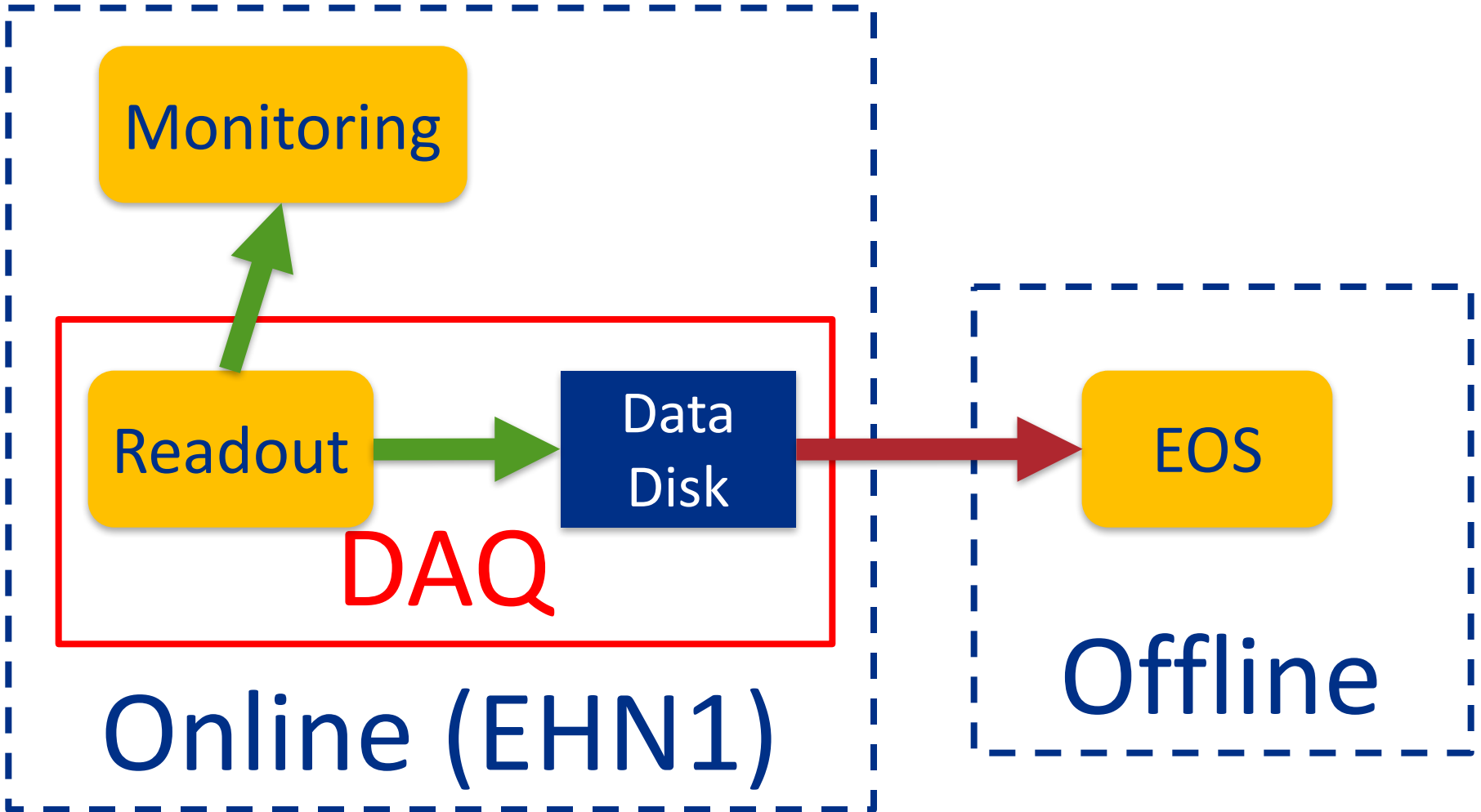
# Comments

- Two detectors at EHN1
  - Dual phase and Single phase
  - Major difference are the read out electronics
  - I am from single phase detector
- I worked on the Dzero experiment at Fermilab from 1998 till the end of the Tevatron in September 2011
  - Slow controls
  - Networking
  - DAQ
  - Operations software
  - I need to learn how to do things the CERN way

# Additional Files

- PD-SP\_Status.pdf
  - Physical detector and EHN1 detector hall
- Protodune-Daq-Design-Review-Overview.pdf
  - Overview of DAQ components and architecture
- ProtoDUNE\_data\_management\_update.pdf
  - Transfer of data from online to offline (EOS)

# Online/Offline Interface



# Schedule

- Operational online computing for detector component testing starting in June 2017
- Preliminaries (in parallel) – continuing today
  - Requirements and design
  - Define procedures
  - Barracks with computing racks at EHN1 (at least 2 months)
- Installation at EHN1 starting in about 2 months (April 2017)
  - Network
  - Online computing
  - DAQ computing
- Testing of detector components (warm) June – August 2017
- Testing of detector components (cold) August – December 2017
- Operations – Summer 2018

# Define Online Computing Procedures

- Procedures requiring specification and development
  - Independent of architecture
  - These are the typical procedures needed for operating an experiment
- Secure access
- Grant user access to resources
- File storage and backup – source code, configurations
- Operational accounts
- Resource allocation
- Report problems / issues / suggestions
- Insure stable operations

# Resources and Services

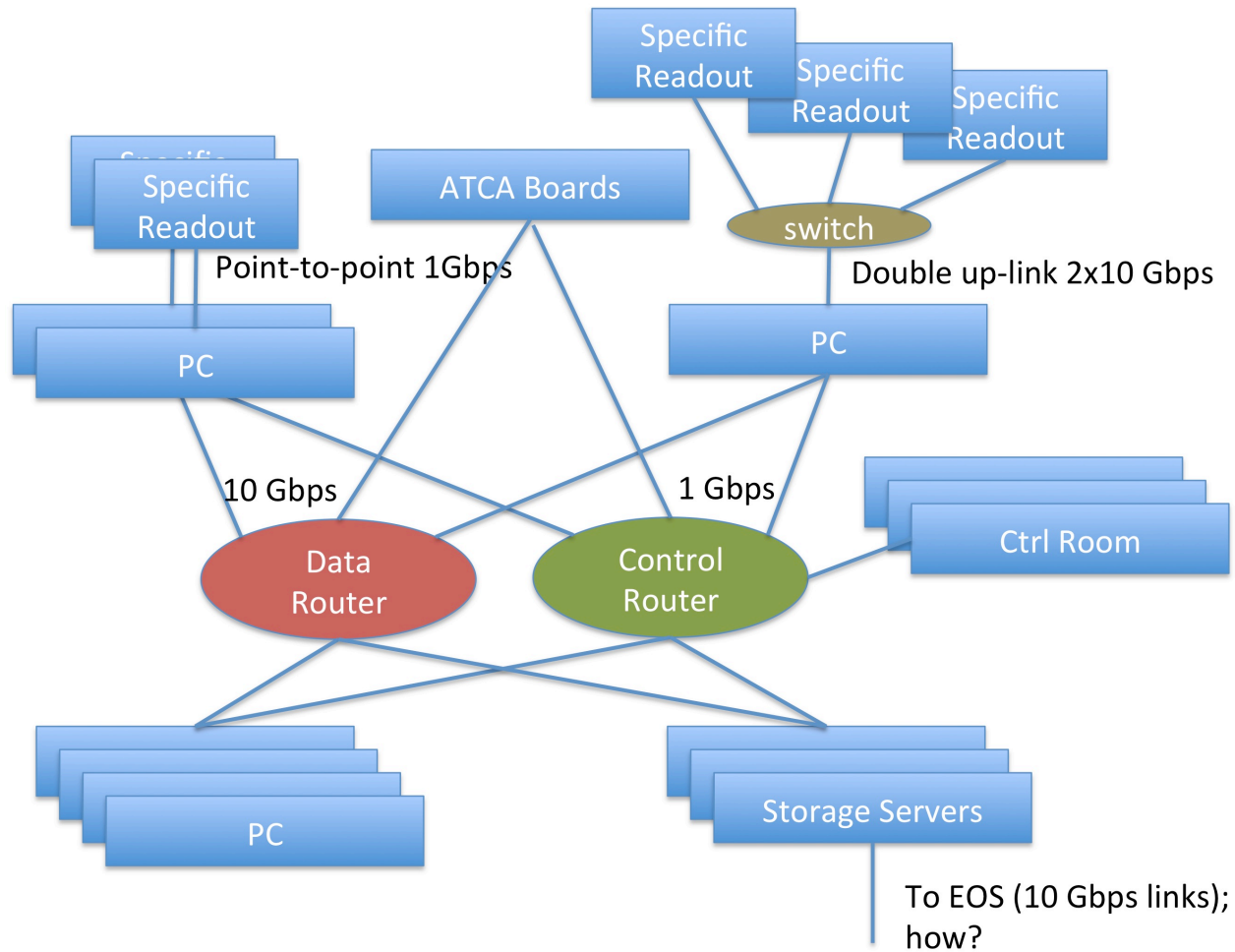
- Resources
  - Network
  - Network attached storage (NAS) – NFS
  - Control room computers
  - Security – gateway computers
  - Interactive computing – login
- Services
  - Web server
  - DHCP
  - DNS
  - Ganglia
  - Backups
  - Group accounts
  - pLappd readout through PCI card
  - Databases (more on next slide)



# Databases

- Logbook – already requested by Giovanna
- DAQ
  - mongodb – supported by Fermilab
  - Information on run conditions
- Beam instrumentation
  - Identify particle entering detector
  - On technical network
  - Covered by CERN beam instrumentation staff
- Slow controls
  - WIN-CC/PVSS
  - On technical network
  - Covered by CERN staff
- “Cable” database – eventually create labels for all cables
- QA/QC under development

# DAQ Network (from Giovanna)



# Next Steps

- Both EHN1 experiments already plan to meet with CERN networking
  - Need Giovanna Lehmann, returns on 2/8
  - CERN general for interactive access
  - Technical network – slow controls, beam instrumentation
  - Data transfer to EOS
- Giovanna working on external log book access
- Computer purchases – DAQ, Online, Storage
- Software infrastructure basics
  - Operating system installation
  - Working with egroups
  - Security/Safety
- Nektarios working to finalize EOS configuration
- Am I asking the correct questions?