Intensity Frontier Common Beams Data Initiative

Working Group Report to March NuComp

Overview

- Working group established with representatives from:
  - Accelerator Divsion, Minerva, MiniBooNE, Minos, NOvA, LBNE and others
  - Established Redmine project and mail list:
    - IFBeamData
    - ifbeamdata@fnal.gov
  - Held formal meetings on Feb23 and Mar2.
  - Held additional meetings with individuals from and controls groups from AD last week
  - Have drafted a preliminary requirements document that covers the scope of the project
    - See CD-DocDB-4274-v1

In Progress

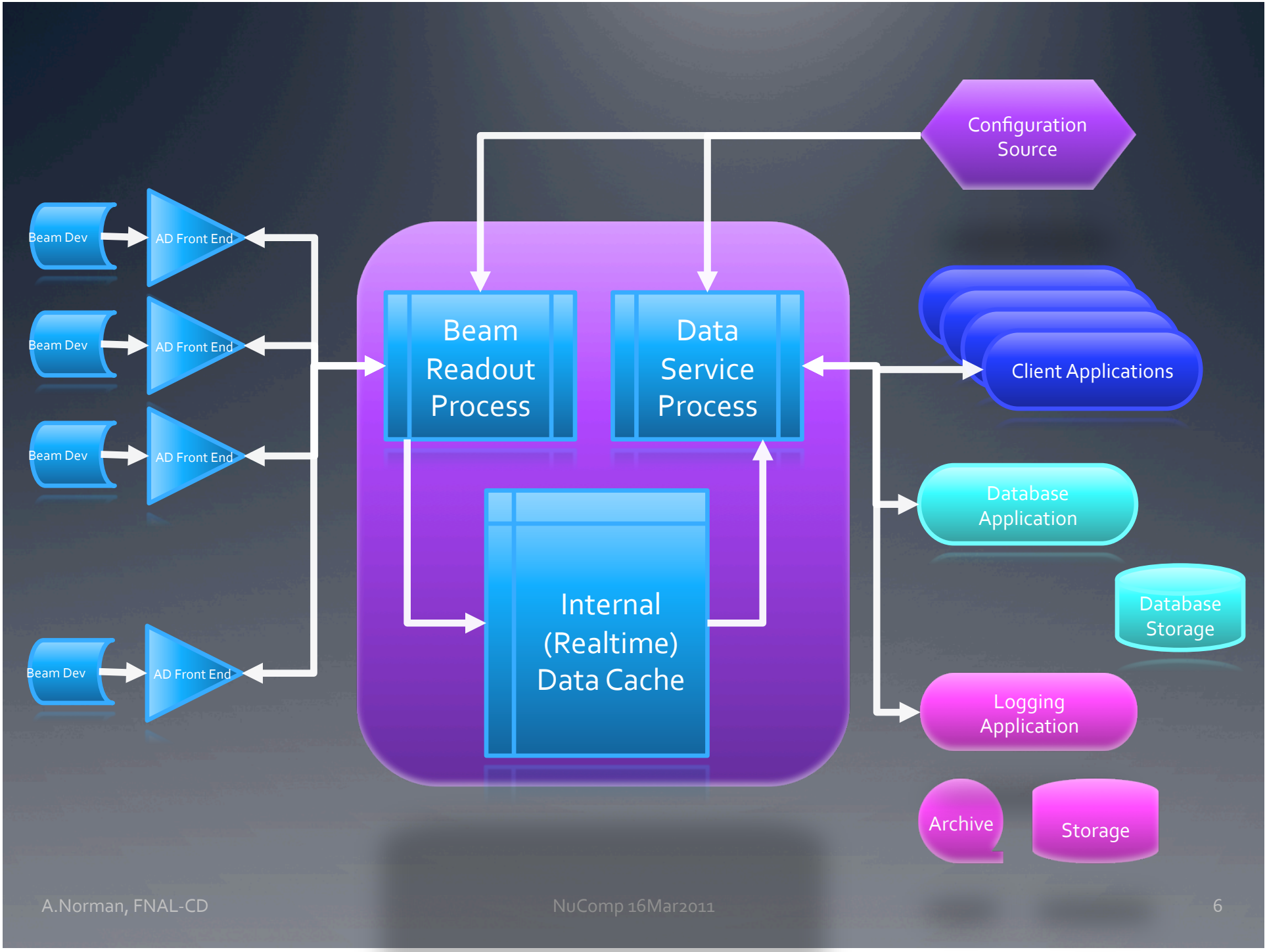
- Need to understand external constraints of the AD systems and obtain clarification on current limitations
- Informal review of the document by the experiments has begun (i.e. I have passed the draft to key people to make sure that some of my interpretation of their notes were correct)
- Informal review by individuals in AD has begun
- Formal review of the requirements document will start when the current round of comments have been merged in to the draft.
  - Expect this to be ready later today

Overview of Draft Requirements

- All the requirements that were requested by the experiments had significant overlap
- No requirements fell into a clear category of:
  - "experiment specific"
- No requirement was deemed as "impossible" by the liaisons from AD
  - A few will require changes to currently implemented readout systems to use newer tools (i.e. update readout modules to use new software)

System Overview

- Requirements generally describe "broker" or "middle man" setup
  - Broker(s) are configured to readout lists of devices on the AD network based on accelerator events
  - Broker(s) collect and correlate "beam spill events" with beam monitoring data and produce spill/event records
  - Broker(s) present or log spill records to client applications and databases
- This is similar to systems that both CDF and DØ use


Configuration Source
Beam Dev
AD Front End
Beam Dev
AD Front End
Beam Dev
AD Front End
Beam Dev
AD Front End
Beam Readout Process
Data Service Process
Internal (Realtime) Data Cache
Client Applications
Database Application
Database Storage
Logging Application
Archive
Storage

Key Requirement

- Beam spills (or other accelerator events) be recorded and logged with universal time stamping
- Beam spill information (POTs, beam position, etc..) correlated to specific spill time and reported
  (with multiple source devices)
- Configurable with event and device lists
- Less critical information also correlated with beam spill
- All information logged to a common (nusoft) database
- All information logged to common files in common format
- Recent information available to online/nearline systems

Key Differences

- Main differences from current Minos/MiniBooNE systems:
  - Information available in real time to DAQ/Monitoring Clients
    - Fast retrieval of current spill information (latency ~50-100ms)
    - Maximum delay between accelerator event and record ready for retrieval into experiment system (for inclusion in DAQ systems) ~ 20-30 seconds
    - Online history buffer for monitoring (allows for monitoring clients with limited history)

Key Differences (cont)

- Improved time stamping:
  - Current systems use a combination of time stamping methods ranging from:
    - High precision (realtime) hardware
    - Software "timer" based
  - New System will provide:
    - Common/Universal time stamping
      - Conversion between device time stamps and bases
      - Single time base for record storage
      - Reporting in common time bases
    - Accelerator events reported with both
      - Universal time &
      - "Time into supercycle"

Key Differences (cont)

- The new system will support non-experiment specific data reporting and retrieval (i.e. not tied to a specific experiment DAQ or offline)
  - Logging
    - System will support logging/archiving to common, easily accessible "nusoft" databases
    - System supports logging/archiving on finer time scale with both raw and derived [corrected/calibrated] data
  - Reporting
    - System supports server/client style reporting using simple API
    - Data is reported in "self describing data blocks/records"
    - System supports modular inclusion of protocols (expandable)

Next Steps

- Continue to vetted the current document to a final requirements document
  (this week)
- Evaluate the current solution
  - MINOS and MiniBooNE systems
  - CDF and DØ systems
- Decide on a course of action for further implimentation
- Begin engineering specifications for a system or modification to existing systems