CLAS12 Offline Software

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CLAS12 Detector Workshop

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Philosophy

- Object-oriented design
- Leverage existing technologies
  - XML
  - Relational databases
  - Source code version management
- Cooperation/collaboration with other JLab-related groups
  - Hall D/GlueX
  - Data Acquisition

Technology Choices

- Language: C++
  - Java components possible
- Source code documentation: Doxygen
- Source code management: Subversion
- Coding standards: yes
- I/O formats: EVIO, ROOT, etc.
- Database engine: MySQL
- Wiki: Mediawiki

Accomplishments

- Geometry: HDDS (Richard Jones, UConn)
  - An XML: validating parser, outside simulation
  - Common with Hall D
- Simulation: GEANT4
  - HDDS input routines (Joern Langheinrich, USC)
  - Hit generation scheme (Joern)
    - XML driven
    - Multiple detectors can use same hit class

Accomplishments (cont.)

- GEANT4 -> EVIO API (Elliott Wolin, JLab)
- Start on geometry (Joe Santoro, CUA)
- Start on magnetic field (Maurizio Ungaro, UConn)
- JANA reconstruction framework (David Lawrence, JLab)
- Doxygen system (Maurik Holtrop, UNH)
- Subversion repository (David, Joe)
- Overall software framework design (Vardan Gyurjyan)

Task List (now)

- Directory structure
- Repository structure
- Make system
  - traditional
  - Autoconf
- GEANT4 development
  - detailed geometry
  - hit scheme
- Input/Output classes
  - EVIO
  - ROOT
- Reconstruction
  - JANA structure
  - all detectors
  - Tracking, tracking, tracking

Task List (future)

- Framework
- Event display
- Documentation systems
  - counting room
  - offline
- Web services
  - calibration data
  - run information
- DST's
- Calibration database
- Magnetic field map management
- EPICS time history
- Farm job management
- Grid

Detector Systems

- Beamline
- Inner tracking chamber
  - SVT
  - Micromegas
- Inner TOF
- Inner Calorimeter
- Cerenkov counters
  - High threshold
  - Low threshold
- Forward drift chambers
- Forward TOF
- Forward calorimeter
  - CLAS-era
  - Pre-shower
- Magnets: geometry/field
  - Solenoid
  - Torus

Project Management

- Gantt chart projects
- Put in manpower
- Define milestones
- Establish deadlines
- Questions:
  - Appropriate level of formality?
  - Cost in manpower?

Summary

- Desire for a planned, structured, integrated and well-managed software environment
- Working hard to provide a structure for making that happen
- Dual approach
  - Big-picture thinking
  - Fast prototyping
- Lots of interesting, challenging projects

Communication

- Wiki
  - clasweb.jlab.org/wiki
  - Click on “CLAS12 Software”
- Email list
  - clas12_software@jlab.org
- Weekly meeting/conference call
- Video conferencing/desktop sharing: VRVS, www.vrvs.org