Sim/Recon Overview

- Elements of Simulation/Reconstruction
- Development, Validation & Checking
- Areas Needing Attention
Flow in Gleam

- **G4**
  - Simulation Algorithms

- **Digitization Algorithms**
  - ACD, TKR, CAL
  - Trigger

- **Reconstruction Algorithms**
  - ACD, TKR, CAL

- **Source Generators**

- **Transient Data Store**
  - **Level 0**
  - **Persistency Service**
  - **Level 1**

- **Ntuple Service**

- **Ntuple**

- **Raw data**

- **Ready for astronomy**

- **MC**
- **Real Data**

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R. Dubois  
Sim/Recon Overview  
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Development Model

- **Standard tools**
  - cvs, CMT, Visual Studio/gcc

- **Release Manager**
  - "continuous integration"
  - Nightly builds of release-in-progress and release-to-come
    - "tag early and often"
      - Latest tags are tested together
      - HEAD is ignored
  - **Packages expected to**
    - Compile and link
    - Unit test run
    - Flagged if either fail!

- **System Tests**
  - Run for each Release
  - ~8 configurations of Gleam producing ~80 histograms each
  - Tracked in database; web viewable with comparisons to previous releases – attempting to auto-flag changes
Validation and Checking

- Last official performance validation was ~Nov 2002 for Gleam v3 release
  
  http://www-glast.slac.stanford.edu/Software/reviews/Performance/Gleam/v3/

- CAL & TKR geometry reviews done in June 2003
  - See Leon’s talk

- Sources validated this spring in Analysis Group
  

- Heaviest-duty checking at the moment is from Bill Atwood in the process of doing PSF, Aeff and bkg studies

- G4 – a long story!
  - See Francesco’s talk
Areas Needing Attention - 1

- **Sources**
  - Are we in a position to generate a day’s data?
    - Able to break up day into segments
    - Able to insert transient sources
    - Point sources?
  - No known problems with background sources
  - See Toby’s talk

- **Particle Transport**
  - Need to re-do Tune’s EM physics validation of G4
  - Look at hadronic physics
  - Look at heavy ion physics
  - Need test suite and good contact with G4 team for ongoing use
  - See Francesco’s talk
Areas Needing Attention - 2

• Geometry
  – CAL still has updates to make
  – ACD needs validation!
  – See Leon’s talk

• Digitization
  – Update CAL for EM data results on light taper and calibration functional forms
  – Complete TKR merge of Bari/Simple Digis; incorporate any new EM knowledge

• Recon
  – Continuing CAL work on energy leakage and crack corrections (using Bill’s currently)
  – Event shape analysis and shower up/down determination
  – Incorporation of event classification, ID and interpretation
  – Output of Level 1 information
Areas Needing Attention - 3

• Validation
  – We are still discovering errors
  – Need to include diagnostics from Bill’s end-use work
  – System Tests
    • Need an iteration on the initial plots
    • More bulletproof method of flagging changes
    • Someone to champion the system!
      – Will at least partially be responsibility of new SciProg hire at SLAC
  – Very few eyes looking at Gleam!
  – We should also review unit tests to ensure they are useful

• Documentation
  – GlastRelease/Gleam User Guides etc are aging.
  – They need to be spruced up – and maybe another iteration
  – See Heather’s talk
Areas Needing Attention - 4

• **Infrastructure**
  – We are still suffering with memory leaks in Root I/O
    • Ursula in Paris to restart looking this week
  – Randoms seeding seems to have broken
    • Need new owner now that Karl has left; Xin volunteering
  – We still have no user gui for post-Gleam event analysis
    • We have possible head-start with a Root gui, but have not been able to apply manpower to it

• **Pipeline**
  – OPUS pipeline looks promising, but we now need source code to adapt to our dataset database and batch system
  – Have not been able to get our hands on the code
  – Will try bringing in bigger guns to help goose the system
Upcoming Disruptions

• The usual run of upgrades
  – We ought to be able to change to gcc 3.2 shortly
    • Requires new Gaudi
    • Alex has set up test bed
    • Should be seamless this time
  – Visual .Net as default
    • Seems to be ready now
    • Transition to .Net 2003 not ready
  – New CMT is out with some nice features
    • Toby is trying them out

– When to do these?
Summary

- Still need to finish off the chain of event interpretation post current Recon

- Major challenge is validation and checking
  - Need to better foster verifying that things are correct and that changes don’t break the system
  - Need to predict what we will need for DC1 operationally and test it before we need it
    - Good examples are reprocessing lots of events and examining them in the Event Display
    - Will maintain a TODO list from the Workshop to start addressing this