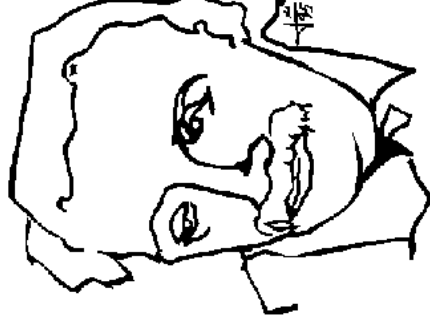


QuickTime™ et un  
décompresseur TIFF (LZW)  
sont requis pour visionner cette image.



01<sub>10</sub>10011101  
101<sub>01</sub>000101  
010<sub>10</sub><sub>11</sub>0100

Boole





## Simulation

- LHCb application: Gauss
  - Using GEANT4 for first time in DC04
  - Validation done essentially comparing with Geant3 (test beams for calorimeters in 2002)
  - Gaudi framework extension to interface to G4: GiGa
    - ☆ Physics list selections
    - ☆ Tracking parameters
    - ☆ Geometry conversion from LHCb geometry model to G4
    - ☆ Output conversion to LHCb event model
  - Event generation using Pythia 6.2 and EvtGen
  - Production version using latest G4 (6.1)
  - Output: HepMC (GEN) and LHCb event model for hits and MC truth (SIM)

- Persistency integrated into Gaudi as from Dec '03
- Windows version in Feb '04 (very useful for debugging)
- Used as persistency plugin to Gaudi
  - Former Gaudi persistency still available (allows conversion)
- LCGDict generated from XML-LHCb using Gaudi Object Description (GOD) and gcc-xml in rare cases
- Performance penalty
  - Files ~ 1.5 times larger (double/float)
  - Write CPU ~ 7 times slower
- Problems encountered
  - Sometimes difficult to provide a full set of dictionaries for highly templated classes



## POOL (cont'd)

- File catalog
  - Plan to use the AliEn file catalog as main repository (anticipating ARDA)
  - Production jobs: use XML file catalog
    - ☆ Cross-populating AliEn and LHCb-BK catalogs after successful transfer
    - ☆ Re-processing: add XML slice in sandbox
  - Analysis
    - ☆ Use physical file name for tests (no file catalog needed)
    - ☆ Use XML slice, but no navigation possible
    - ☆ Use direct access to catalog (not available yet for AliEn) for general use and/or event collections
- Bookkeeping
  - Based on LHCb-BK (same as DCO3), includes provenance info
    - ☆ Partly using GridPP manpower
  - LHCb-BK used within ARDA for tests of ProvenanceDB (Taiwan)



## SEAL and PI

- SEAL
  - Used through POOL and dictionary for GaudiPython so far
  - Plan to include it in post-DC release of Gaudi (June '04)
    - ☆ Including component model
    - ☆ Joint effort with ATLAS
  - Interest in Mathlib (currently GaudiGSL package)
  - Start using Python for scripting: GaudiPython, pyROOT
    - ☆ Bender: an analysis framework in Python
- PI
  - Use the AIDA-ROOT implementation (replacing HTL)
    - ☆ HBOOK and ROOT as persistency backends
  - Look forward for event collection / Tuple standard interface



## LCG2

- LHCb production through Dirac
  - Workload management system
  - Interfaces to batch systems (LSF, BQS,...) and Grid (EDG, LCG)
  - Pull paradigm using local agents
    - ☆ LCG is "yet another site"
  - Close collaboration with the EGEE middleware team (definition and tests)
- Data management
  - Files should be accessible within and outside the Grid
  - Declaration of files produced outside LCG2 in RLS
  - Declaration of files produced in LCG2 as physical files in AliEn FC
  - Concern with Mass Storage at major sites (SRM?)
  - Very cooperative attitude of the deployment team
- Expectation
  - Produced 50% of DCO4 through LCG2 (middleware and resources)

- LHCb Distributed Analysis framework: GANGA
  - Joint effort with ATLAS (mainly GridPP funded)
  - GANGA is the baseline for the LHCb prototype within ARDA
  - Aim at using GANGA for analysis of DCO4
    - ☆ Should be available for users in June
  - Very good collaboration with the ARDA project
    - ☆ Already many contacts on work-plan / time-scale
    - ☆ One full day meeting in March
    - ☆ Workshop 20-22 April (ATLAS, LHCb, ARDA)
  - Functionality
    - ☆ Job wizard for Gaudi-based applications (analysis but also production)
    - ☆ Job preparation (workflow, dataset definition, job options)
    - ☆ Job submission (including job splitting and merging)
    - ☆ Multiple back-ends: fork, batch queues, LCG, EGEE



## Conclusions

- LHCb has contributed in several areas of LCG-AA
  - POOL (storage manager, ROOT-based backend, file catalog)
  - SEAL (PL, dictionaries)
  - Due to limited resources, LHCb cannot keep the 2.6 FTE level contribution: down to ~ 1 FTE+
- LHCb is committed to using most AA software
  - Needs time to integrate with its framework
- Not enough manpower to work on early versions of LCG Grid
  - Plan to use LCG2 for 50% of DC04, first test promising
  - Good collaboration with LCG-DA
- Starts (fruitful?) collaboration with ARDA on GANGA