

### ROOT, LCG & the others...

#### Report on ROOT'05 David Chamont (LLR)



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ROOT project structured in work-packages ROOT team is ~15 instead of ~3







## BASE work-package

New

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- Plugins auto-loading
- Xrootd (file server)
- Many improvements to TThread.
- TMacro, TZIPFile, TFileMerger, XML parsers.
- gcc 4.0.x and MacOS X Tiger on PowerPC and on Intel
- coding style rules checked nightly
- move to subversion?
- Plans
  - New THtml & Help/Doc system
  - Plug-in manager extensions
  - TPRegexp
- Long-term
  - I/O thread safe





 In the May CINT/Reflex Workshop, they decided the redesign of CINT so to take advantage of Reflex (SEAL) Data Structure.

### Done

- Reflex anx Cintex (gives a CINT API to the Reflex Ditionary)
- Expected in the short-term (2005)
  - rootcint –reflex
  - rootcint –reflex -gccxml
- Mid-term plans (early 2006)
  - Adapt PyRoot and CINT to Reflex



- Now
  - Full STL support (persistent and browsable)
  - Data compression ( Double32\_t )
  - Tree I/O from ASCII, tree indices
- Plans
  - Consolidation, Consolidation, Consolidation
  - <u>Generic Object Reference support</u>
  - More cases in auto schema evolution
  - TreeSQL
  - Read ahead with large caches



## MATH work-package

### MathCore

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- 3D and 4D Vector package
- Basic Math functions
- MathMore
  - Special functions, statistical functions, derivation, integration, interpolation, root finding, chebyshev polynomials, etc...
  - Implemented on top of a subset of GSL.

### Plans

- Add Random numbers
- Define interfaces for functions and numerical algorithms to be used by client libraries (TF1)
- Redesign fitting interfaces
- Import new C++ Minuit





#### News

- Task force working on PROOF work-package since ROOT restructuring
- Several new features introduced
  - "interactive batch" mode
  - GUI controller
- Plans
  - Next step is to get the experiments start using PROOF
  - Test-bed being setup at CERN
  - Experiments welcome to send data samples and complex selectors to better tune the system





- After ten years of development with a micro team of ~3, they have suddenly growed to ~12, + experiment contributors.
- A real merge between LCG and ROOT teams for what concerns base classes and dictionaries.
- A long awaited task force for the redesign of Math classes, including C++ experts.
- Major release 5.08 expected for 15 December

# Long Term Vision



- data rate at the LHC will be low for the first 2 years
- running time will be low (4 months/year?)
- we will have enough resources to analyze all data interactively
- meanwhile multi-core CPUs will be expanding
- large memory caches will become available
  - will require simple extensions of xrootd (may be already there)
  - exploit large caches on client too
- true parallelism (with communication for histograming) will be a must.
- Currently GRID systems (batch-oriented) do not make a difference between local CPUs, local farms and distributed CPUs on the GRID.
- Will the GRID be used for data analysis? Or will the combination "my laptop" and "local farm" be sufficient?

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