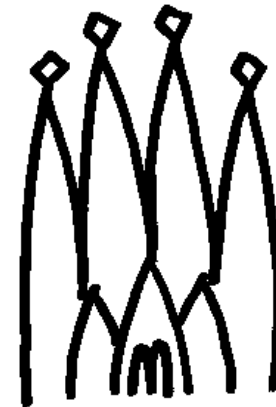


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# Status of GAUDI



P. Mato / CERN

Computing meeting, LHCb Week

23 February 2000

# Outline

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- ◆ Recent History
- ◆ Work going on
- ◆ Current problems
- ◆ CHEP contributions
- ◆ ATLAS collaboration

# Recent History

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- ◆ Nov 23 '99 - third GAUDI release
  - Functionally complete version (basic services, access to SICb data, detector description framework, histograms, n-tuples, examples, ... )
- ◆ New sub-detectors starting using the framework
  - Calorimeter, Trigger L1, VELO, RICH, ...
- ◆ Many problems reported and very constructive feedback
  - A list of 40 items produced
  - Prioritisation
- ◆ Better understood how sub-detectors can work independently
- ◆ Feb 14 '00 - Bug fix release for some of the packages
  - Completely backwards compatible

# Work going on: Data access

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- ◆ Overcoming deficiencies in *EventSelector*
  - Handling more than one jobID or file
  - Without event input file
- ◆ Bookkeeping database API
  - Understanding how to access the bookkeeping DB from GAUDI

# Work going on: Event Model

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- ◆ Improved performance of SICb converters
  - Avoided extra passes for resolving references
- ◆ Structure of transient event store
  - Build the tree structure from the local information of SICb *Converters*
- ◆ Conformance to new Units
  - Make the necessary conversions in the *Converters*
  
- ◆ Helping sub-detectors
  - Trigger, Calorimeter, ...
- ◆ Review activities
  - Calorimeter data model reviewed last week

# Work going on: Detector Description

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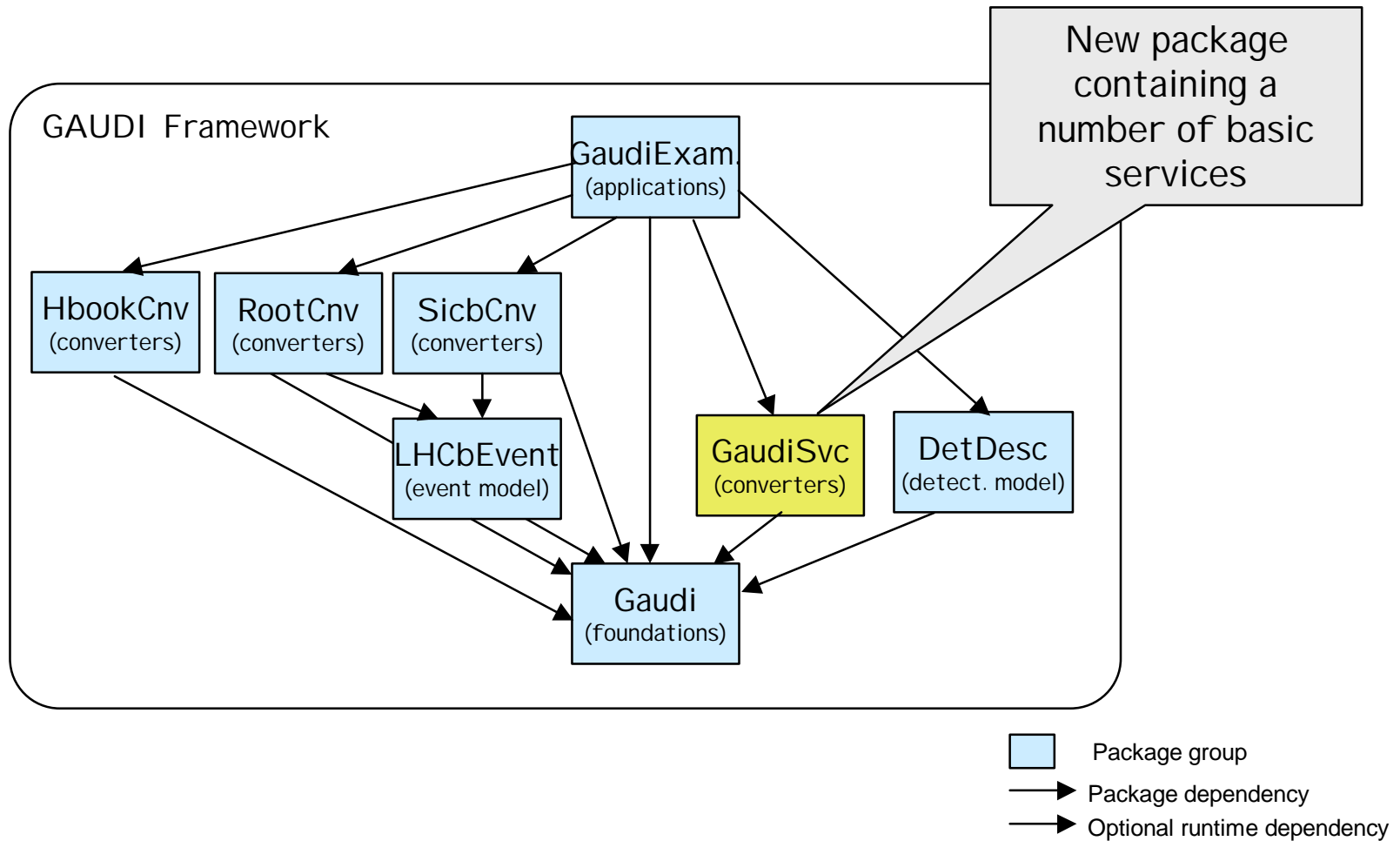
- ◆ Improved XML Document Type Definition (DTD)
  - Better adapted to the needs of sub-detectors
- ◆ Allow simple mathematical expressions in XML assignments
  - Handle units explicitly
  - Document how a numbers is calculated from others
- ◆ Improved user friendliness
  - Implemented many suggestions from the user feedback
- ◆ Estimation of the material between two points in the detector
  - Request from the Tracking group
- ◆ Started to define the interface to the “Conditions Database” (calibration, alignment, slow control,...)
  - Implementation carried out by IT/DB

# Work going on: Basic Services

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- ◆ Improved *JobOptionsSvc* service
  - Support for environment variables and some preprocessor directives
- ◆ Changed *HistogramSvc* service
  - Conformance to the new histogram interface (AIDA project in LHC++)
- ◆ New Chrono service
  - Utility service for measuring elapsed time
- ◆ New Random number generator service
  - Centralized control over random number sequences
- ◆ Visualization service
  - Continuing the integration with OpenScientist

# Work going on: Re-packaging





# Current Problems

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- ◆ Dynamic libraries
  - Sharing data through FORTRAN common blocks between 2 dynamic libraries
  - STL maps use static storage.
- ◆ ClassID and IID management
  - Worldwide allocation of ClassID and InterfaceID
- ◆ Data dictionaries
  - Need if we want to automatically generate converters
- ◆ Still CMT on NT is not yet perfect
  - Environment variables, manual builds, ...
- ◆ Release procedure too time consuming
  - Multiple platforms (Linux, NT)
  - Need an automatic nightly or weekly rebuild

# CHEP contributions

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- ◆ LHCb computing papers presented at the International Conference on Computing in High Energy and Nuclear Physics, February 7-11, Padova.
  - *GAUDI - The software architecture and framework for building LHCb data processing applications*, by M. Cattaneo
  - *LHCb detector description framework*, by R. Chytrcek
  - *Data persistency solution for LHCb*, by M. Frank
  - *Use of Configuration Management tool in LHCb software*, by P. Mato on behalf of F. Ranjard

# Collaboration with ATLAS

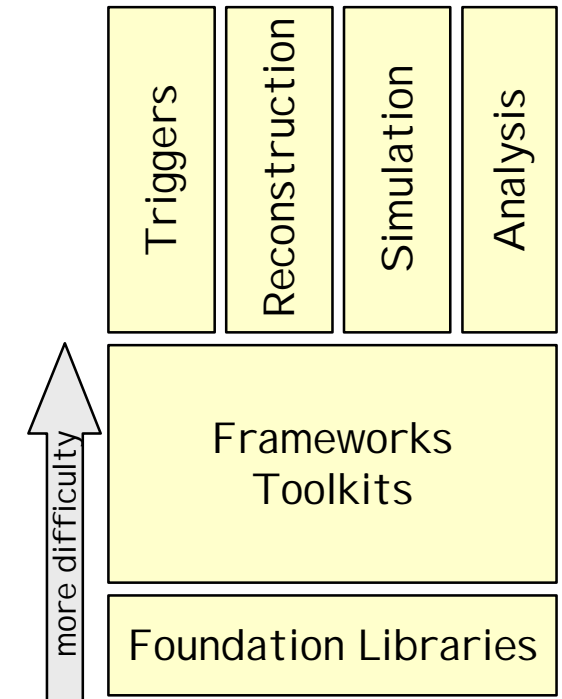
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## ◆ Background

- The ATLAS architecture team got interested with GAUDI architecture as a candidate for evaluation.

## ◆ Collaboration Scope

- Common foundation libraries
- Common interface model
- Common frameworks (interfaces + basic services)
- Different *Event Model* and *Algorithms*
- Different Applications



# Collaboration with ATLAS (2)

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## ◆ Benefits

- Better architecture
- Sharing development of basic infrastructure services (higher quality)
- CERN/IT efforts better focussed (single request may fulfill more than one experiment) (AIDA project)
- Better communication (same vocabulary)

## ◆ Disadvantages

- Less freedom
- Needs more formality (change procedures, upgrades, etc.)
- It may fail

# Collaboration with ATLAS (3)

- ◆ GAUDI is being evaluated
- ◆ Proposed and decided to base their May prototype on GAUDI

ATLAS Software Week, 15 Feb 2000

## GAUDI Evaluation

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- Use case coverage
  - Does their architecture address all use cases? [8]
  - Does their implementation demonstrate consistency with their architecture? [8]
  - Can we identify changes/enhancements to their implementation, within the context of the architecture, to address what we consider to be important use cases? [8]
- Software Process
  - Based on their documentation, do they appear to have lived by what they've preached? [8]
  - What is the quality of their documentation? [7]
  - Has their evolution from their first prototype to V3 been consistent with their projections? [8]
- Physical Design & Configuration
  - How easy is it to build V3 of Gaudi? [7]
  - Is the code of a high quality? [8]
  - What stress have they laid on testing? [5]
  - Are the tools they've chosen adequate? [8]

David R. Quarrie: ATLAS Architecture and Framework

# Summary

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- ◆ After the release of last version new sub-detector groups started using the GAUDI framework. SICb migration.
  - A lot of feedback.
- ◆ Improving the product
  - Working currently in many areas. Emphasis on “usability”.
- ◆ The GAUDI framework is known outside LHCb
  - CHEP2000
  - ATLAS will use GAUDI for their May prototype