Status of
EUDET NA2 - ANALYS
Common Analysis and Simulation Software

- Frank Gaede
- DESY
- EUDET Extended Steering Committee Meeting
- September 1, 2008

Objectives for task ANALYS

- **development of a common data analysis and simulation infrastructure**

  - development of a software framework for the exchange, analysis and comparison of test beam data
  - development of a software framework for the simulation of test beam experiments
  - creation of a repository for experimental and simulation data
  - embedding into existing GRID infrastructure

- **strategy**

  - the testbeam software effort is tightly integrated with the overall common ILC/LDC software effort !
  - implement tools and functionality specific to testbeams
  - benefit from synergies where possible
  - same for grid tasks: integrate with common ILC grid activities

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Deliverables and Requirements

- **requirements**:

  - documentation and its regular update are of utmost importance
  - other EUDET participants should contribute by:
    - properly defining the requirements of the framework
    - providing and interfacing simulation and reconstruction software for the various detector technologies
    - testing the framework.
- **deliverables**:

- **first version** of the common data analysis and simulation framework ready **after 21 month**

  - development however must continue throughout the whole duration of the project

Contributors for task ANALYS

	DESY	ALU-FR	IPASCR	TOTAL
REQUEST				
Perm Staff ppm				
Temp Staff ppm	12.000	8.000		20.000
Perm Staff Cost kEUR				
Temp Staff Cost kEUR	62.500	46.875		109.375
Travels kEUR	1.300	0.867		2.167
Consumables kEUR				
Overheads kEUR	12.760	9.548		22.308
Total Manpower ppm	12.000	8.000		20.000
Total Cost kEUR	76.560	57.290		133.850
COMMITTMENT				
Perm Staff ppm	12.000		3.000	15.000
Temp Staff ppm				
Perm Staff Cost kEUR	62.500		9.000	71.500
Temp Staff Cost kEUR				
Travels kEUR				
Consumables kEUR				
Overheads kEUR	12.500		1.800	14.300
Total Manpower ppm	12.000		3.000	15.000
Total Cost kEUR	75.000		10.800	85.800
TOTAL BUDGET				
Perm Staff ppm	12.000		3.000	15.000
Temp Staff ppm	12.000	8.000		20.000
Perm Staff Cost kEUR	62.500		9.000	71.500
Temp Staff Cost kEUR	62.500	46.875		109.375
Travels kEUR	1.300	0.867		2.167
Consumables kEUR				
Overheads kEUR	25.260	9.548	1.800	36.608
Total Manpower ppm	**24.000**	**8.000**	**3.000**	**35.000**
Total Cost kEUR	**151.560**	**57.290**	**10.800**	**219.650**

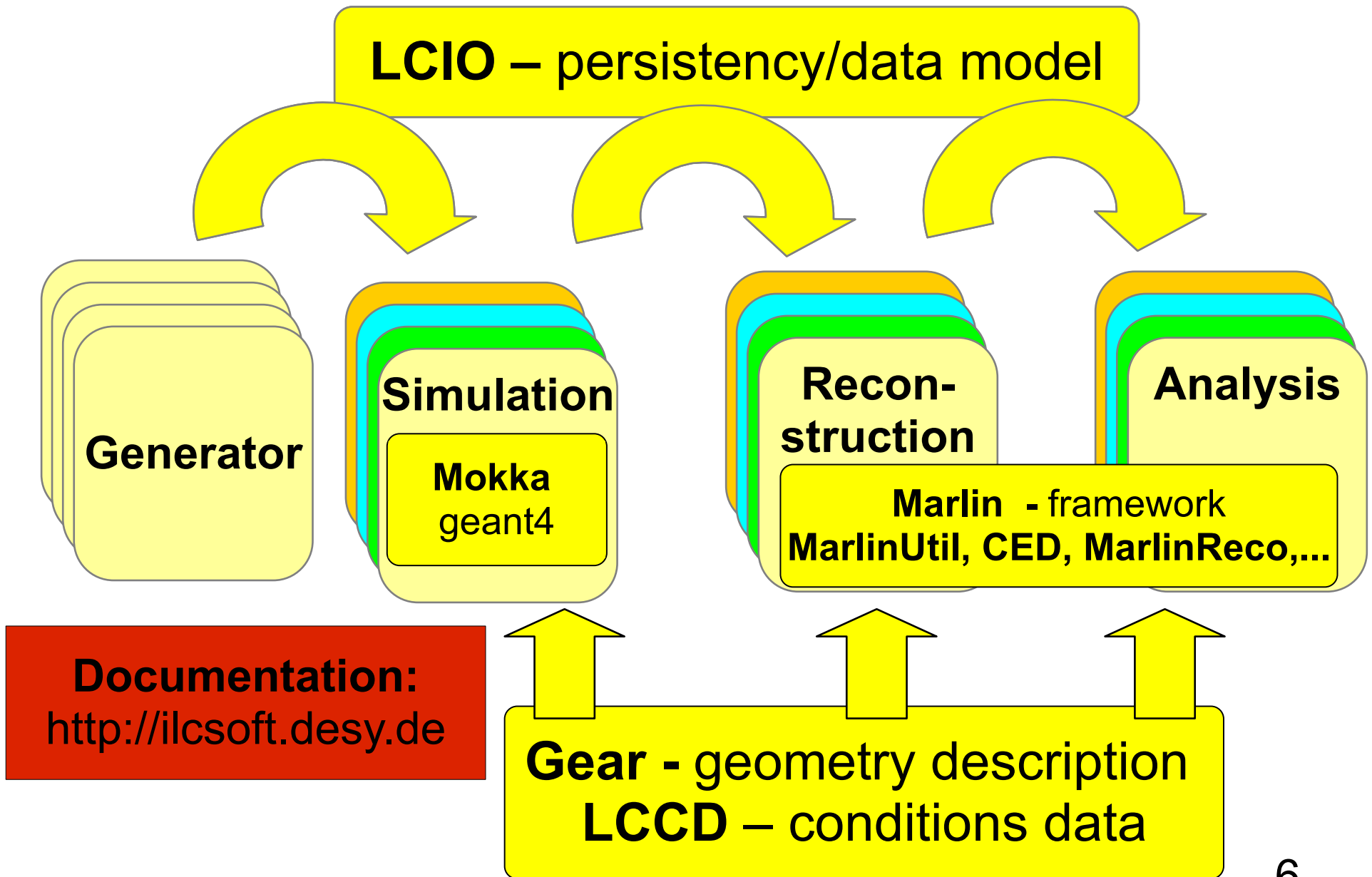ALU-FR now RFWU-Bonn

Contributors ANALYS
(Request+Committment)
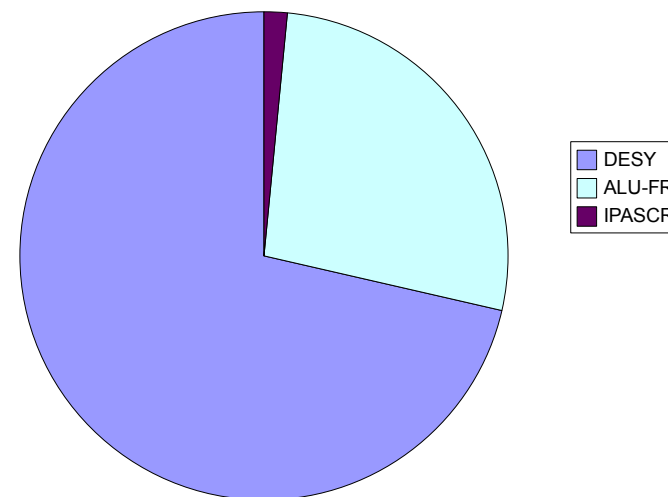
- DESY
- ALU-FR
- IPASCR

Usage of budget - ANALYS

- **DESY**

  - commitment 12ppm: F.Gaede 25% for full project length
  - 12ppm (scientist) converted to hire a programmer for 18 month
    - started August 2006 – ended December 2007
    - used funds from COMP to extend contract until end of project (24 month)

- **RFWU-Bonn** (K.Desch)

  - 8ppm (scientist) combined with funds from JRA2 to hire a postdoc that works on JRA2 and ANALYS (*MarlinTPC* sw project)
    - started early 2007

- **IPASCR** (J.Cvach)

  - commitment 3ppm: PhD student that works part time on calorimeter simulation with geant

EUDET/LDC SW-framework

LCIO – persistency/data model

Generator

Simulation

Mokka
geant4

**Recon-
struction**

Analysis

Marlin - framework
MarlinUtil, CED, MarlinReco,...

Documentation:
http://ilcsoft.desy.de

Gear - geometry description
LCCD – conditions data

SW-Framework Milestone

Frank Gaede, EUDET-Extended Steering Committee, Sep. 1, 2008

Marlin et al - A Software Framework for ILC detector R&D

- september 2007: v01-00

- 'first' release of fully functional software framework for simulation, reconstruction and analysis of ILC (testbeam) data

EUDET-Report-2007-11

- EUDET milestone: "Version 1.0 after 21 month" was reached

F. Gaede, J. Engels

December 17, 2007

- since then:

  - bug fixes, improvements, new features (requests), e.g.

  - direct access in LCIO

  - event overlay mechanism

current version: v01-04 used for LOI Monte Carlo mass production: **15 M** events for ILC detector fully simulated and reconstructed

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framework usage by EUDET activities

- **JRA3 - CALICE tbeam software**
  - usage of Mokka, LCIO, Marlin, Gear, LCCD
  - started before EUDET
- **JRA2 - MarlinTPC**
  - usage of LCIO, Marlin, Gear, LCCD
  - started with EUDET
- **JRA1 – EUTelescope**
  - usage of Mokka, LCIO, Marlin, Gear (LCCD?)
  - ported existing code to common framework last year and actively used it for test beam analysis
- all groups actively use the grid for data storage and processing within the VOs 'calice' and 'ilc'

framework usage by EUDET activities II

- **JRA3 - CALICE tbeam software**
  - ~> 35 TB tbeam data taken at DESY, FNAL and CERN
  - fully processed and analysed in ILCsoft framework
- **JRA2 - MarlinTPC**
  - very active development of TPC reconstruction and digitization code)
  - important feedback also for 'full' ILD detector TPC
  - started to use ilcsoft framework for first data from testbeam and cosmicsO 100 k events
  - plan to re-analyze older cosmic data w/ MarlinTPC
- **JRA1 – EUTelescope**
  - fist tbeam data taken and analyzed (DESY, CERN)

Summary

- NA2 task ANALYS: "Provide a software framework for simulation and analysis (of testbeam data)"

- EUDET milestone: "Version 1.0 after 21 month" was reached

- software is fully grid compatible and the grid is used for data storage and analysis

- all EUDET JRAs use the common software framework and provide important feedback for ongoing improvements and future developments

The usage of a common software framework provides the basis for a fruitfull interplay between detector R&D groups, core software developers and the groups working on full ILD detector optimization.