

Plans for EUDET NA2 Task ANALYS Common Analysis and Simulation Software

Frank Gaede/ Ties Behnke
DESY

Objectives for task ANALYS

- **development of a common data analysis and simulation infrastructure**
 - development of a **software framework** using modern software technology to exchange test beam data and software for common analysis and comparison of measurements
 - development of a **software framework** for the simulation of test beam experiments needed for the interpretation of the measurements
 - creation of a **repository** for experimental and simulation data
 - **embedding into existing GRID infrastructure** to allow easy exchange of data and transparent exploitation of other available computing resources.

(from annex1)

Personnel planning ANALYS

- **DESY**
 - commitment 12ppm: F.Gaede 25% for full project length
 - request: 12ppm (scientist) plan to hire programmer for ~18 month
 - start early 2006
 - possibly extend position with other funding sources
- **ALU-FR** (K.Desch)
 - request: 8ppm (scientist): plan to combine with funds (8ppm) from COMP to hire a postdoc that works part-time on COMP and ANALYS
 - Apr/May 2006
- **IPASCR** (J.Cvach)
 - commitment: 3ppm: PhD student that works part time on calorimeter simulation with geant4
 - ongoing

General strategy for ANALYS

- Maximise the Synergy with general ILC activities:
no EUDET specific software
 - avoiding of double work
 - a lot of what's needed already exists
 - insufficient resource assigned via EUDET
- The testbeam software effort will be part of the overall common ILC/LDC software effort !
 - implement tools and functionality specific to testbeams
 - benefit from synergies where possible, e.g. use geant4 application for full detector also for testbeam (Mokka/Calice)
- Heavy reliance on GRID: utilise LHC + community developments

Software packages for ILC framework

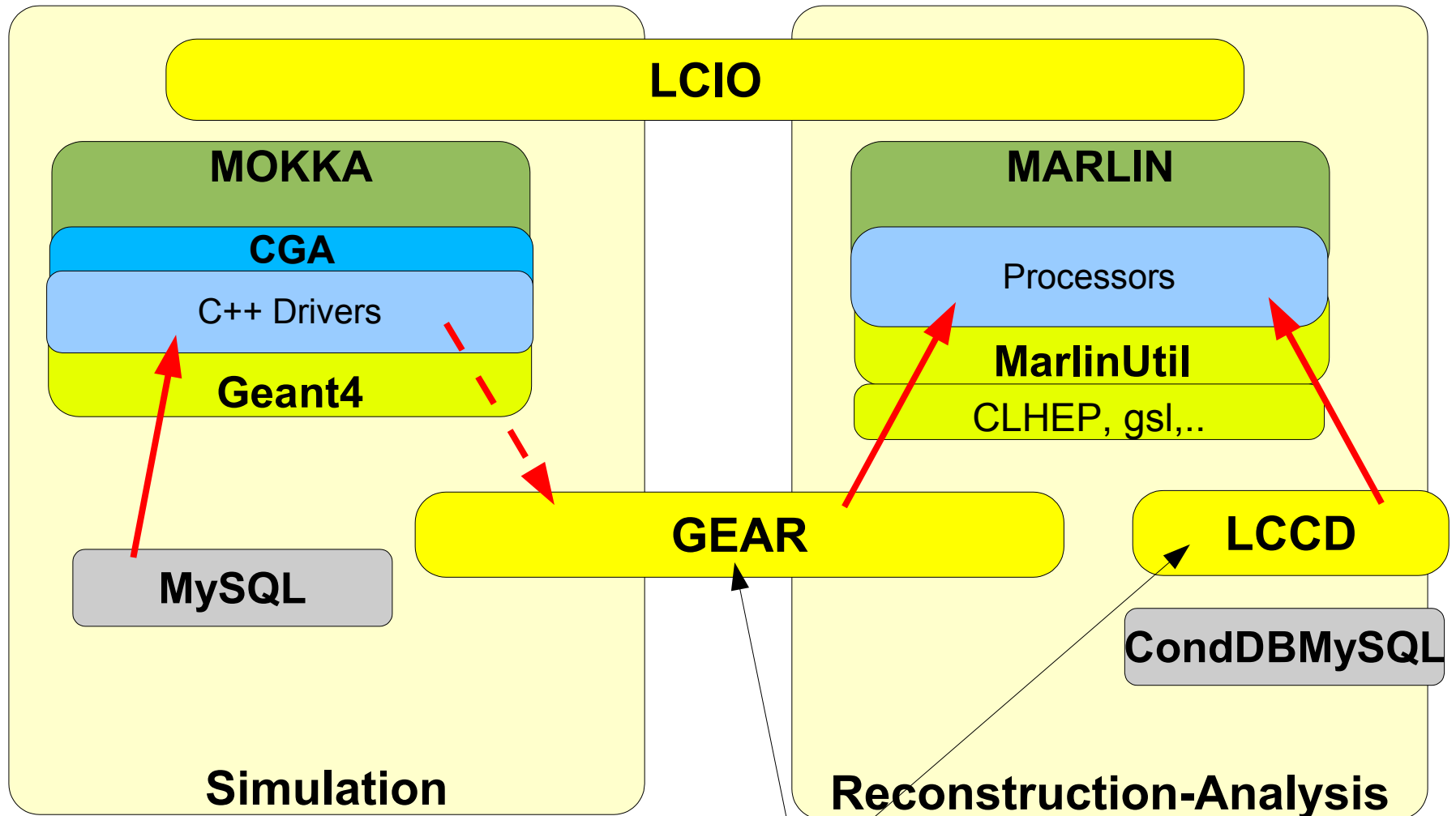
- **LCIO**
 - data model & persistency
- **Mokka**
 - geant4 full simulation
- **Marlin**
 - C++ application framework
 - **MarlinReco**
 - Marlin based reconstruction
- **LCCD**
 - conditions data toolkit
- **GEAR**
 - geometry description

all packages developed at
or with contributions
from DESY

-> DESY will naturally continue
to develop and improve these
tools in the context of EUDET

Lots of the software developments are done in cooperation
with groups in other regions.

LDC software framework



requires work that is specifically related to testbeam program

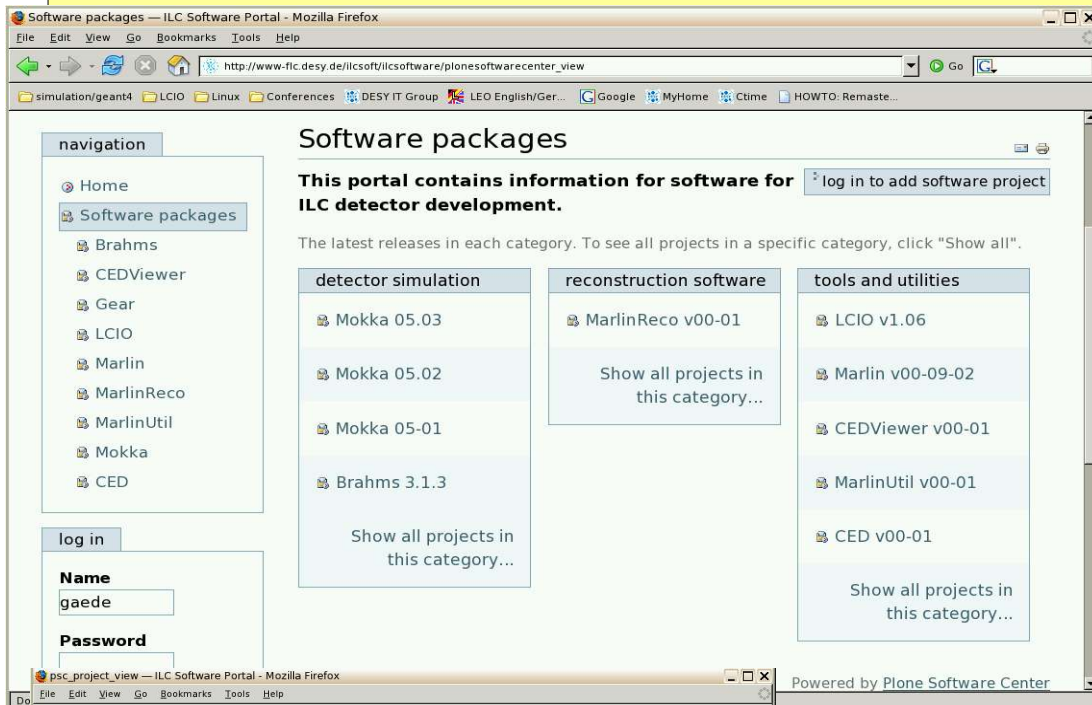
Software developments

- General software: framework exists and in use
- Testbeam software: have to make every effort to integrate these into the overall software frame:
 - Use the general data formats also for test beam
 - utilise the existing frameworks for data storage and analysis
 - contribute to the further development and improvement

Avoid as much as possible insular stand alone solutions

ILC software portal

Ties Behnke Frank Gaede: Software in EUDET



Software packages — ILC Software Portal - Mozilla Firefox

http://www-ipc.desy.de/ilcsoft/ilcsoftware/plonesoftwarecenter_view

Software packages

This portal contains information for software for ILC detector development. [log in to add software project](#)

The latest releases in each category. To see all projects in a specific category, click "Show all".

detector simulation	reconstruction software	tools and utilities
Mokka 05.03	MarlinReco v00-01	LCIO v1.06
Mokka 05.02	Show all projects in this category...	Marlin v00-09-02
Mokka 05-01		CEDViewer v00-01
Brahm 3.1.3		MarlinUtil v00-01
Show all projects in this category...		CED v00-01
		Show all projects in this category...

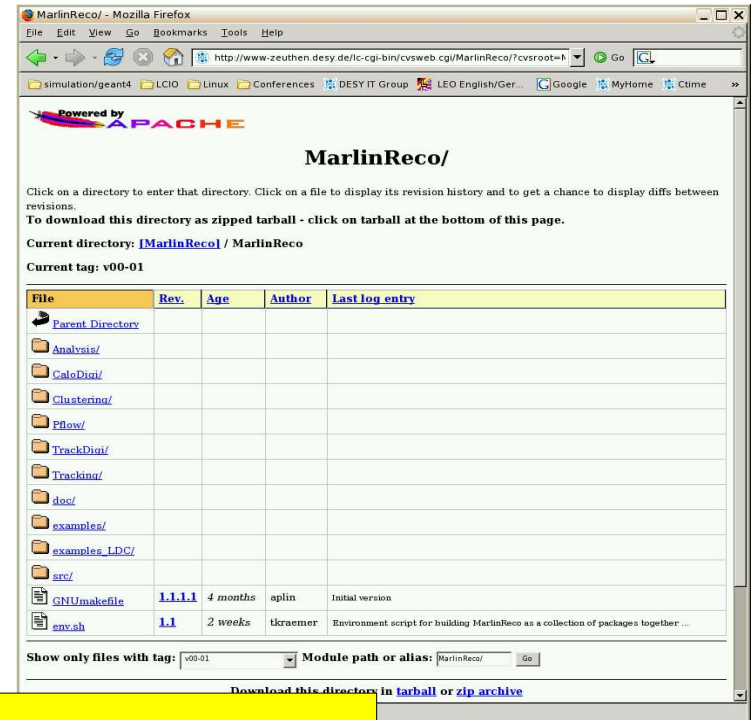
log in

Name:

gaede

Password:

Powered by Plone Software Center



MarlinReco/ - Mozilla Firefox

http://www-zeuthen.desy.de/ilc-cgi-bin/cvsweb.cgi/MarlinReco/?cvsroot=ilc

MarlinReco/

Click on a directory to enter that directory. Click on a file to display its revision history and to get a chance to display diffs between revisions.

To download this directory as zipped tarball - click on tarball at the bottom of this page.

Current directory: [MarlinReco/](#) / MarlinReco

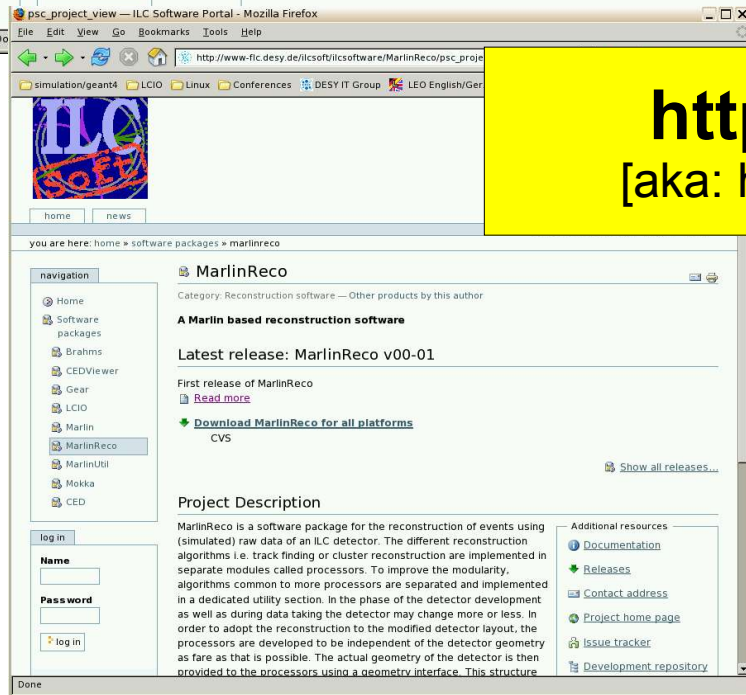
Current tag: v00-01

File	Rev.	Age	Author	Last log entry
Parent Directory				
Analysis/				
CaloDist/				
Clustering/				
Pflw/				
TrackDist/				
Tracking/				
doc/				
examples/				
examples_LDC/				
src/				
GNUmakefile	1.1.1.1	4 months	aplin	Initial version
env.sh	1.1	2 weeks	tkraemer	Environment script for building MarlinReco as a collection of packages together...

Show only files with tag: Module path or alias: [Go](#)

[Download this directory in tarball or zip archive](#)

<http://ilcsoft.desy.de>
[aka: <http://www-flc.desy.de/ilcsoft>]



psc_project_view — ILC Software Portal - Mozilla Firefox

http://www-ipc.desy.de/ilcsoft/ilcsoftware/MarlinReco/psc_project_view

MarlinReco

Category: Reconstruction software — Other products by this author

A Marlin based reconstruction software

Latest release: MarlinReco v00-01

First release of MarlinReco [Read more](#)

[Download MarlinReco for all platforms](#)

CVS [Show all releases...](#)

Project Description

MarlinReco is a software package for the reconstruction of events using (simulated) raw data of an ILC detector. The different reconstruction algorithms i.e. track finding or cluster reconstruction are implemented in separate modules called processors. To improve the modularity, algorithms common to more processors are separated and implemented in a dedicated utility section. In the phase of the detector development as well as during data taking the detector may change more or less. In order to adopt the reconstruction to the modified detector layout, the processors are developed to be independent of the detector geometry as far as that is possible. The actual geometry of the detector is then provided to the processors using a geometry interface. This structure

Additional resources

- [Documentation](#)
- [Releases](#)
- [Contact address](#)
- [Project home page](#)
- [Issue tracker](#)
- [Development repository](#)



MarlinReco/documentation/

you are not logged in

MarlinReco

A Marlin based Reconstruction Package for the ILC

T. Krämer et al., DESY

This document serves as a comprehensive manual to help users getting started with the Marlin based reconstruction software MarlinReco for the international linear collider (ILC). After a short review of the underlying packages (LCIO, Gear, Marlin, MarlinUtil) and a summary of required libraries, an introduction to the features of MarlinReco is given. Furthermore a detailed description helps to install MarlinReco together with all underlying packages. It is also explained how to invoke MarlinReco and influence its behaviour using the steering file. Finally you learn how to write own processors so that many scientist from the HEP community can contribute to this Project.

Contents

- [Introduction](#)
- [Dependency on other Packages](#)
- [LCIO](#)

documentation & spreading the information

Grid activities

- ongoing grid activities:
 - DESY
 - H1 and ZEUS Monte Carlo production
 - ILC Monte Carlo production started
 - Tier2 for Atlas and CMS currently set up
 - ALU-Fr
 - Tier2 for Atlas currently set up
- use existing experience to create grid infrastructure:
 - job submission scripts (computing grid)
 - data catalogue (data grid)

Plan: mainly ALU-Fr (postdoc) activity
in close collaboration with DESY groups (FLC,IT)

Summary

- NA2 task ANALYS: “Provide a software framework for simulation and analysis (of testbeam data)”
- 35 ppm:
 - DESY: 24 , ALU-FR: 8, IPASCR: 3
- main activities planned:
 - DESY: overall simulation and analysis framework
 - ALU-FR: gridification of software and data
 - IPASCR: simulation software (geant4)

All EUDET software activities should be carried out in close collaboration with other ILC groups and in the context of the existing software framework/ grid installations

Backup slides ...

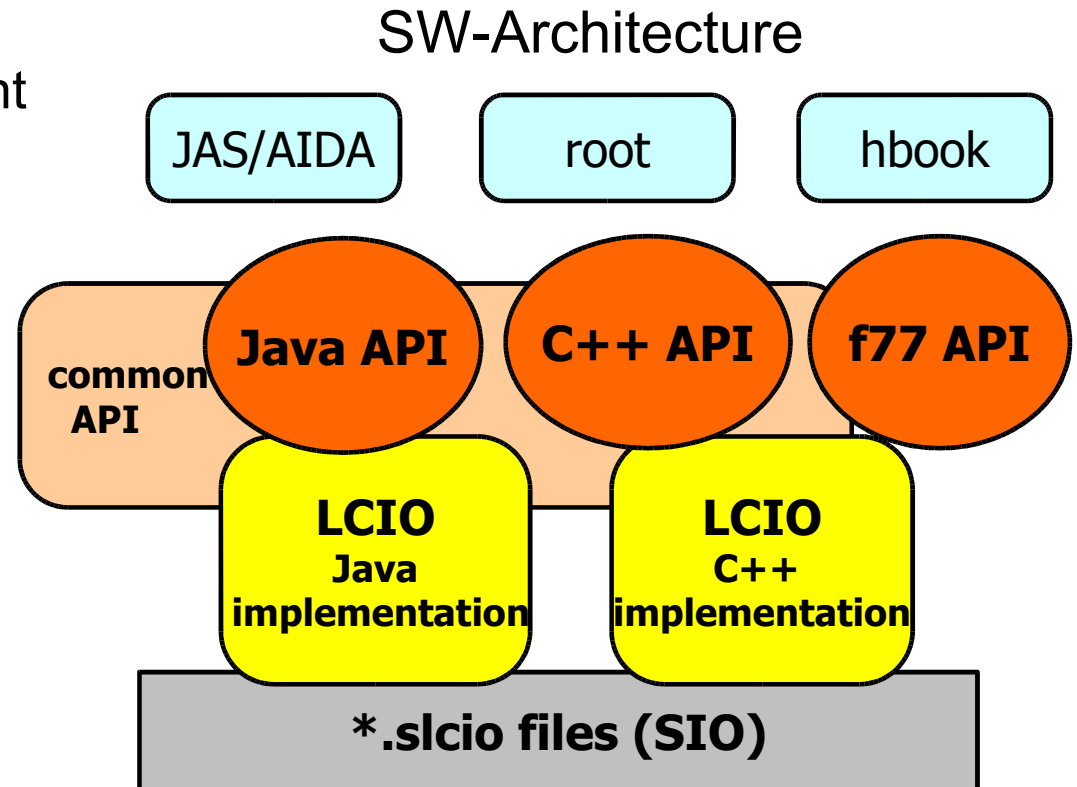
LCIO overview

- DESY and SLAC joined project:
 - provide common basis for ILC software
- Features:
 - Java, C++ and f77 (!) API
 - extensible data model for current and future simulation and testbeam studies
 - user code separated from concrete data format
 - no dependency on other frameworks

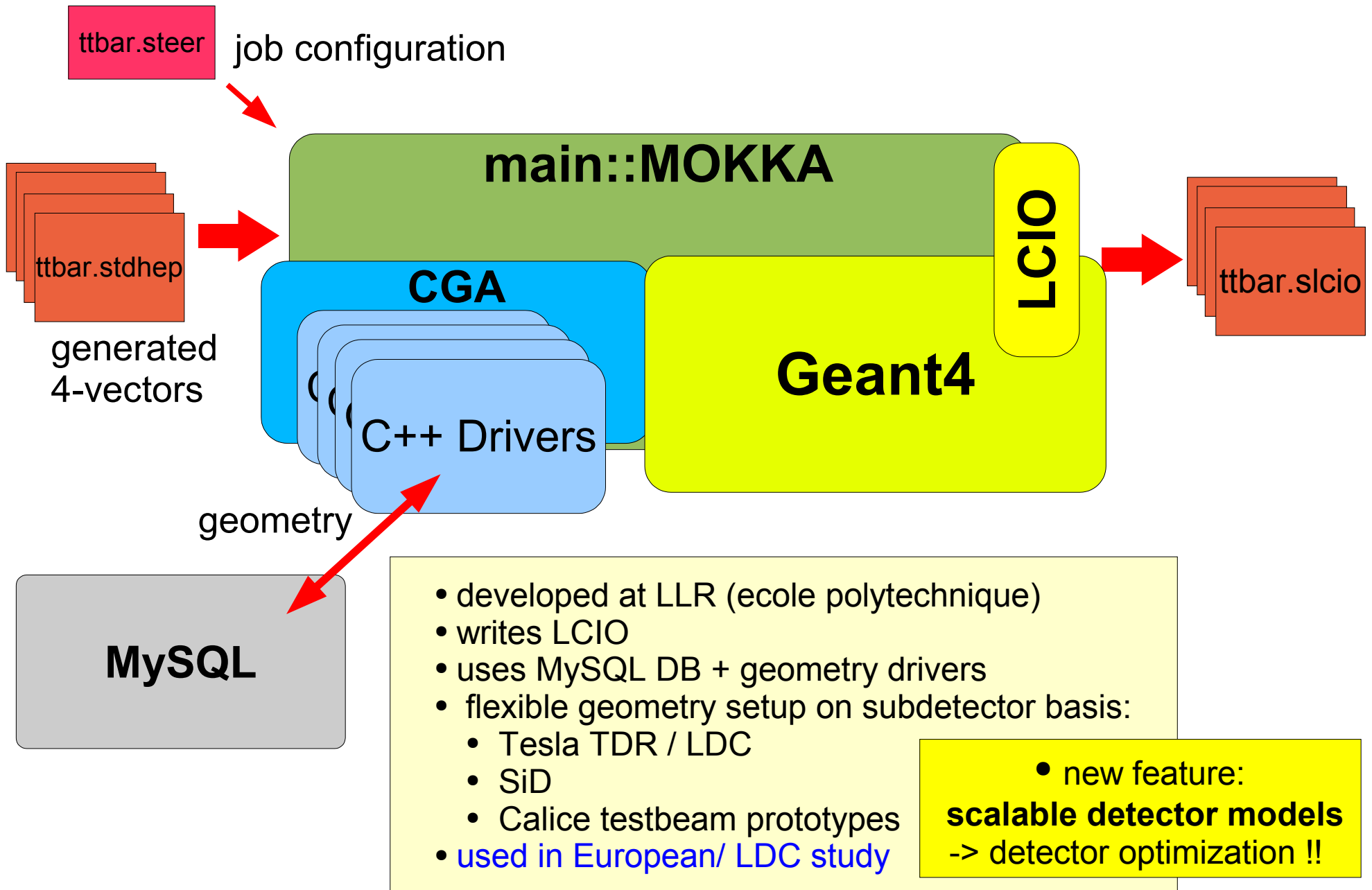
simple & lightweight

new release: **v01-06**

now de facto standard
persistency & datamodel
for ILC software



Mokka overview



Deliverables and Requirements

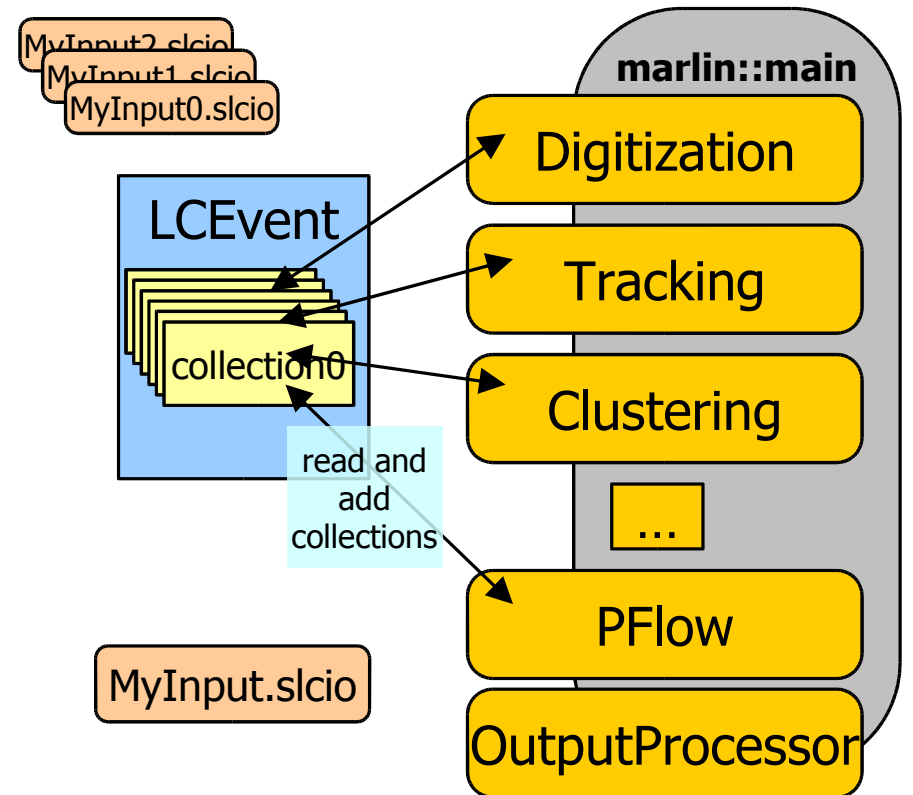
- **documentation and its regular update are of utmost importance**
 - “spread the information”
- the participants in this Networking Activity (only?) contribute by:
 - properly defining the requirements of the framework
 - providing and interfacing simulation and reconstruction software for the various detector technologies
 - testing the framework.
- Deliverables:
 - we expect to have a **first version of the common data analysis and simulation framework ready after 18 month**
 - development however must continue throughout the whole duration of the project to cope with
 - the increasing demands caused by the accumulation of data
 - the expected increasing complexity of the experiments.

(from annex1)

Marlin

Modular **A**nalysis & **R**econstruction for the **L I N**ear Collider

- modular C++ **application framework** for the analysis and reconstruction of LCIO data
- uses LCIO as transient data model
- software modules called Processors
- provides main program !
- provides simple user steering:
 - program flow (active processors)
 - user defined variables
 - per processor and global
 - input/output files
 - **Plug&Play** of processors



Gear

GEometry API for RReconstruction

```
<gear>
  <!--
    Example XML file for GEAR describing the LDC detector
  -->
  <detectors>
    <detector id="0" name="TPCTest" geartype="TPCParameters" type="TPCParameters"
      <maxDriftLength value="2500."/>
      <driftVelocity value=""/>
      <readoutFrequency value="10"/>
      <PadRowLayout2D type="FixedPadSizeDiskLayout" rMin="386.0"
        maxRow="200" padGap="0.0"/>
      <parameter name="tpcRPhiResMax" type="double"> 0.16 </parameter>
      <parameter name="tpcZRes" type="double"> 1.0 </parameter>
      <parameter name="tpcPixRP" type="double"> 1.0 </parameter>
      <parameter name="tpcPixZ" type="double"> 1.4 </parameter>
      <parameter name="tpcIonPotential" type="double"> 0.00000003
    </detector>
    <detector name="EcalBarrel" geartype="CalorimeterParameters">
      <layout type="Barrel" symmetry="8" phi0="0.0"/>
      <dimensions inner_r="1698.85" outer_r="2750.0"/>
      <layer repeat="30" thickness="3.9" absorberThickness="2.5"/>
      <layer repeat="10" thickness="6.7" absorberThickness="5.3"/>
    </detector>
    <detector name="EcalEndcap" geartype="CalorimeterParameters">
      <layout type="Endcap" symmetry="2" phi0="0.0"/>
      <dimensions inner_r="320.0" outer_r="1882.85" inner_z="2820.0"
        outer_z="2820.0"/>
      <layer repeat="30" thickness="3.9" absorberThickness="2.5"/>
      <layer repeat="10" thickness="6.7" absorberThickness="5.3"/>
    </detector>
  </detectors>
</gear>
```

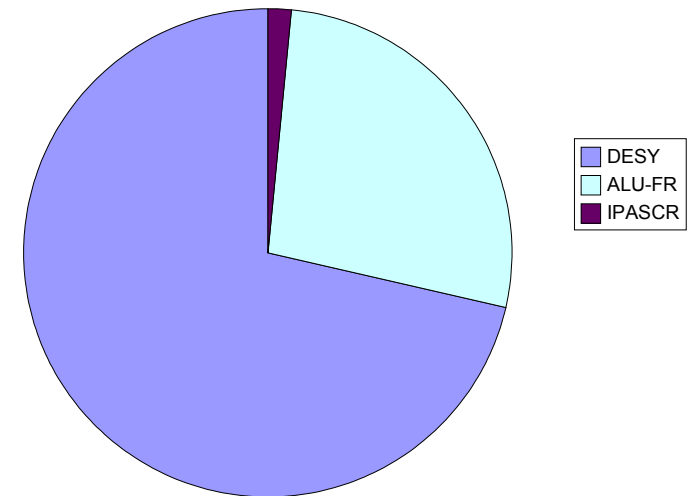
compatible with US – compact format

- well defined geometry definition for reconstruction that
 - is flexible w.r.t different detector concepts
 - has high level information needed for reconstruction
 - provides access to material properties - planned
- abstract interface (a la LCIO)
- concrete implementation based on XML files
- and Mokka-CGA – planned

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
COMMITMENT				
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

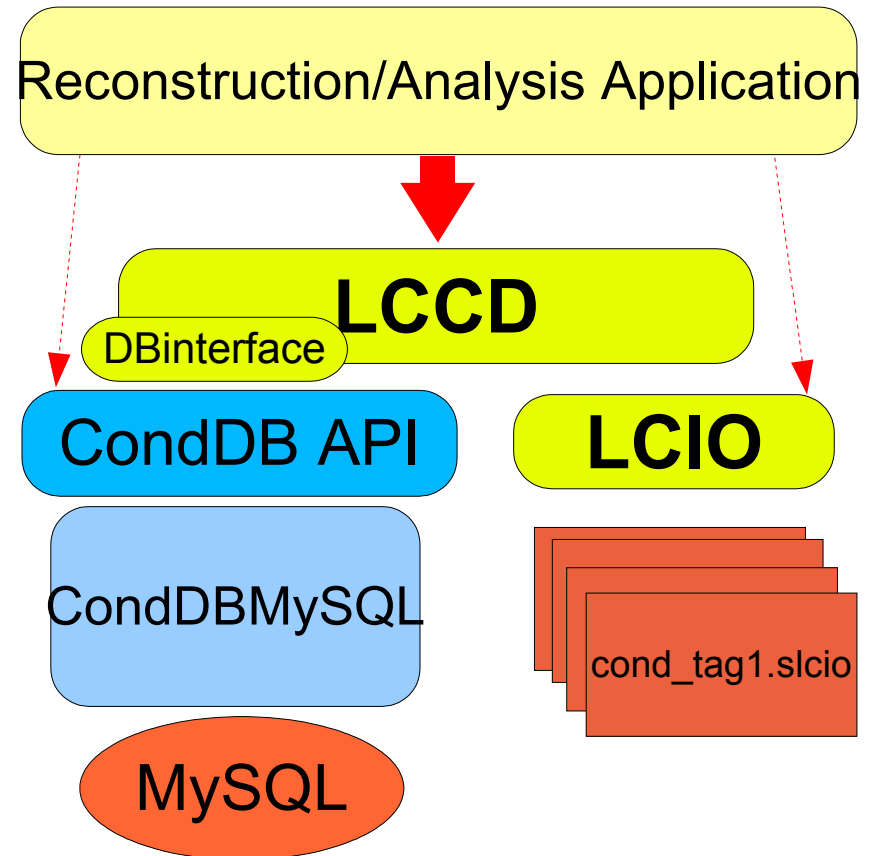
Contribuors ANALYS
(Request+Committment)



LCCD

Linear **C**ollider **C**onditions **D**ata Toolkit

- Reading conditions data
 - from conditions database
 - from simple LCIO file
 - from LCIO data stream
 - from dedicated LCIO-DB file
- Writing conditions data
 - tag conditions data
- Browse the conditions database
 - through creation of LCIO files
 - vertically (all versions for timestamp)
 - horizontally (all versions for tag)



LCCD is used by Calice for the conditions data of the ongoing testbeam studies